



SES COLLEGE SREEKANDAPURAM

(Accredited by NAAC with 'B' Grade) Affiliated to Kannur University



Criterion 1
Curricular Aspects

1.2 Academic Flexibility

1.2.1 Percentage of Programmes in which Choice Based Credit System (CBCS)/ elective course system has been implemented

Sl No.	Supporting Documents
1	Minutes of Academic council/BOS meeting
2	Detailed Syllabus



SES COLLEGE

SREEKANDAPURAM
EDUCATIONAL
SOCIETY

Affiliated to Kannur University
Accredited by NAAC at 'B' Grade

SREEKANDAPURAM POST,
KANNUR DISTRICT,
KERALA, PIN:670631
PH: 0460 2230293, 2231145



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Criterion 1 – Curricular Aspects

Key Indicator- 1.2 Academic Flexibility

1.2.1 Percentage of Programmes in which Choice Based Credit System (CBCS)/ elective course system has been implemented



Dr. Dominic Thomas
Dr. DOMINIC THOMAS
Principal
S.E.S. COLLEGE
SREEKANDAPURAM

KANNUR UNIVERSITY
(Abstract)

BA English (Language & Literature) Programme under Choice Based Credit and Semester System - Revised Scheme , Syllabi & Pattern of question papers for Core/Open Courses - Implemented w.e.f 2014 Admission - Orders issued.

ACADEMIC BRANCH

U.O.No.Acad/C3/3951/2014(1)

Dated, Civil Station.P.O, 03-05-2014

Read:1.U.O No.Acad/C2/2232/2014 , dated 14.3.2014

2.Minutes of the meeting of the Board of Studies in English (UG) held on 18.03.2014

3.Minutes of the meeting of Faculty of Language & Literature held on 26-3-2014

4. Letter dated 05.04.2014 from the Chairman, Board of Studies in English (UG)

ORDER

1.Revised Regulations for U.G Programmes under Choice Based Credit and Semester System were implemented in the University with effect from 2014 admission, as per paper read (1) above.

2. As per paper read (2) above, the scheme, syllabus and pattern of question papers for core/open courses in B.A English Language & Literature programme were finalized and recommended for implementation by the Board of Studies in English (U.G).

3.As per paper read (3) above, the meeting of Faculty of Language & Literature, held on 26.3.2014 has approved the scheme, syllabus and pattern of question papers for B.A English (Language & Literature) Programme to be implemented with effect from 2014 admission.

4. As per the paper read (4) above, the Chairman, Board of Studies in English (UG) has forwarded the finalized copy of the Scheme , Syllabi & Pattern of question Papers for Core/Open Courses of B.A English (Language & Literature) Programme for implementation with effect from 2014 admission.

5.The Vice-Chancellor, after considering the matter in detail, and in exercise of the powers of the Academic Council, as per Section 11 (1) of Kannur University Act, 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised Scheme , Syllabi & Pattern of question Papers for Core/Open Courses of B.A English(Language & Literature) Programme under Choice Based Credit and Semester System with effect from 2014 admission.

6. Orders are therefore issued implementing the revised Scheme , Syllabi & Pattern of Question Papers for Core/Open Courses of B.A English (Language & Literature) Programme under Choice Based Credit and Semester System with effect from 2014 admission, subject to report to the Academic Council.

7. The implemented Scheme, Syllabi & Pattern of Question Papers are appended.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)

For Registrar


To:

The Principals of Affiliated Colleges

Copy to:

1. The Examination Branch
2. The Chairman, Board of Studies in English (UG)
3. PS to VC/PA to PVC/PA to Registrar/PA to CE
4. DR/AR-I (Academic).
5. SF/DF/FC

Forwarded /By Order/


SECTION OFFICER

- For more details log on to www.kannuruniversity.ac.in

KANNUR UNIVERSITY



NEW CURRICULUM FOR UG PROGRAMME IN ENGLISH LANGUAGE AND LITERATURE

UNDERGRADUATE BOARD OF STUDIES IN ENGLISH

SYLLABI FOR CORE COURSES IN ENGLISH LANGUAGE AND LITERATURE(2014
ADMISSION ONWARDS)

English Core Courses

General Objectives

English Literature is a product of historical circumstances. There is a complex interaction between literature and its contexts. Literature functions as a critical reflection on people and society in history and on the ways in which people make historical sense of their lives. It is the aim of the course to expand the relation between texts and contexts, and provide a firm foundation for historically contextualized literary study. In the general organization of texts and modules the Board of Studies has been guided by a pragmatic sense of the general requirements of undergraduate studies in English and the kinds of literary traditions, periods and texts that are widely taught and studied in universities and colleges around the world.

Duration: Six semesters of six months each

Scheme:

The Programme comprises of sixteen Courses of which fifteen are Core Courses, including Project and the remaining one is an Elective. In addition, there is an Open Course. The distribution is as follows:

Semester 1: One Core Course, one Complementary Course and three Common Courses

Semester 2: One Core Course, one Complementary Course and three Common Courses

Semester 3: Two Core Courses, one Complementary Course and two Common Courses

Semester 4: Two Core Courses, one Complementary Course and two Common Courses

Semester 5: Four Core Courses, one Open Course

Semester 6: Six Core Courses including an Elective and a Project

Each Course (excluding Open Course and Project) carries 50 marks each (External 40, Internal 10)

Project carries 25 marks (External 20, Internal 5)

Open Course carries 25 marks (External 20, Internal 5)

Total marks for Core, Complementary and Open Courses will be 1000

(Total marks for the entire Programme including Common Courses will be 1500)

1. Table of Core Course

No	Course Code	Title of Course	Hours/Week	Credit	Semester
1	1B01ENG	History of English Language and Literature	6	4	1
2	2B02ENG	Studies in Prose	6	4	2
3	3B03ENG	Linguistics	5	4	3
4	3B04ENG	English in the Internet Era	4	4	3
5	4B05ENG	Studies in Poetry	4	4	4
6	4B06ENG	Literary Criticism	5	5	4
7	5B07ENG	Modern Critical Theory	5	5	5
8	5B08ENG	Drama: Theory and Literature	5	4	5
9	5B09ENG	Studies in Fiction	5	4	5
10	5B10ENG	Women's Writing	5	4	5
11	5B11ENG	Project	3	2	5
12	6B12ENG	Malayalam Literature in Translation	5	4	6
13	6B13ENG	New Literatures in English	5	4	6
14	6B14ENG	Indian Writing in English	5	4	6
15	6B15ENG	Film Studies	5	4	6
16	6B16ENG	Elective 01, 02, 03	5	4	6

2. Table of Electives

No	Course Code	Title of Course	Hours/Week	Credit	Semester
1	6B16(1)ENG	World Literature in Translation	5	4	6
2	6B16(2)ENG	Indian Writing in Translation	5	4	6
3	6B16(3)ENG	Writing for Media	5	4	6

3. Open Course

No	Course Code	Title of Course	Hours/Week	Credit	Semester
1	5D01(1)ENG	English for Competitive Examination	2	2	5

Distribution of Marks for BA English Language and Literature

1. Total Marks for Common Courses	1 to 6 (English)	6x50=300
2. Total Marks for Additional Language Courses	1 to 4 (Languages)	4x50=200
3. Total Marks for Complementary Courses	1 to 4	4x50=200
4. Total Marks for Core Courses	1 to 10&12 to 16	15x50=750
5. Project	1	1x25=25
6. Open Course	1	1x25=25

Total (for the entire Programme) 1500

Internal Assessment (CE)

(20% of the total marks in each Course are for Internal Assessment)

1. Model Examination	5 marks (50%)
2. Attendance	2.5 marks (25%)
3. Assignment/Seminar/Viva	2.5 marks (25%)
(Attendance of each Course may be evaluated as follows)	
90% and above	2.5 marks (100%)
85 to 89%	2 marks (80%)
80 to 84%	1.5 marks (60%)
75 to 79%	1 mark (40%)

(No marks for attendance below 75%)

Distribution of Credits for BA English Language and Literature

Semester	Common Courses		Core Courses	Complementary Courses	Open Course	Total				
	English	II Lang								
1	4	3	4	4	-	19				
2	4	3	4	4	-	19				
3	4		4	4	-	20				
4	4		4	5	-	21				
5	-		5	4	4	4	-	2	19	
6	-		2	4	4	4	4	4	-	22
Total	22	16	64				16	2	120	



KANNUR UNIVERSITY
(Abstract)

B.A English Programme- Scheme of Core & Generic Elective Courses of the Programme and Syllabus and Pattern of Question Paper of the 1st Semester of B.A English (Language and Literature) under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated Colleges with effect from 2019 Admission- Implemented- Orders issued.

ACADEMIC BRANCH

No.Acad.C3/13219/2019

Dated: Civil Station P.O .26.06.2019

- Read:-
1. U.O.No.Acad.C2/429/2017 dated,10-10-2017
 2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
 3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.
 4. The Minutes of the Meeting of the Board of Studies in English (UG), held on 14.06.2019
 5. Scheme and 1st Semester Syllabus of B.A English (Language and Literature) Programme, Submitted by the Chairperson, Board of Studies in English (UG), dated: 22.06.2019

ORDER

1.A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG Programmes in Affiliated Colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision Processes such as conducting the meeting of various Boards of Studies, Workshops, & discussions.

3. The Revised Regulation for UG Programmes in Affiliated Colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. As per paper read (4) above, the Board of Studies in English (UG) finalized the Scheme of Core, & Generic Elective Courses ,Syllabus and Pattern of Question Papers of B.A English (Language and Literature) Programme, to be implemented with effect from 2019 Admission.

5. Subsequently, as per paper read (5) above, the Chairperson, Board of Studies in English (UG) , submitted the finalized copy of the Scheme of Core & Generic Elective Course and Syllabus and Pattern of Question Paper of the 1st Semester of B.A English (Language and Literature) Programme, for implementation with effect from 2019 Admission.

6. The Vice Chancellor, after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, accorded sanction to implement the Scheme of Core & Generic Elective Courses and Syllabus and Pattern of Question Papers of the 1st Semester of B.A English (Language and Literature) Programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated Colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme of Core & Generic Elective Courses and Syllabus and Pattern of Question Paper of the 1st Semester of B.A English (Language and Literature) Programme, are uploaded in the University Website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR(ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering B.A English Programme

- Copy to:-
1. The Examination Branch (through PA to CE)
 2. The Chairperson, Board of Studies in English (UG)
 3. PS to VC/PA to PVC/PA to Registrar
 4. DR/AR-I/ARII (Academic)
 5. The Computer Programmer (for uploading in the website)
 6. SF/DF/FC



Forwarded/By Order

SECTION OFFICER

For more details log on to www.kannuruniversity.ac.in



KANNUR UNIVERSITY

BOARD OF STUDIES IN ENGLISH (U.G.)

SYLLABUS OF CORE COURSES OF B.A ENGLISH LANGUAGE AND LITERATURE PROGRAMME AND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY
VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards. To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

Kannur University

Programme Outcomes (PO)

PO 1.Critical Thinking:

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

Programme Specific Outcomes for BA in English Language and Literature

PSO 1. Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

PSO 2. Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

PSO 3. Understand and apply the extended meaning of “English Literature” to various post-colonial and other writings in English.

PSO 4. Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women’s Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

PSO 5. Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

KANNUR UNIVERSITY

B.A ENGLISH PROGRAMME PROGRAMME

COURSE AND CREDIT DISTRIBUTION STATEMENT

Courses	No of Courses		Credit	
English Common Course (ECC)		6		22
Additional Common Course (ACC)		4		16
Core Course	15	16	60	64
Discipline Elective Core Course (DSEC)	1		4	
Complimentary Elective Course (CEC)		4		16
Generic Elective Course (GEC)		2		2
Total		32		120

KANNUR UNIVERSITY

B.A ENGLISH PROGRAMME PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title	Credits	Hours per week	Marks		
				CE	ESE	TOTAL
I	English Common Course-I	4	5	10	40	50
	English Common Course-II	3	4	10	40	50
	Additional Common Course-I	4	4	10	40	50
	Complementary Elective Course-1	4	6	10	40	50
	Core Course-I- Malayalam Literature in English Translation	5	6	10	40	50
II	English Common Course-III	4	5	10	40	50
	English Common Course-IV	3	4	10	40	50

	Additional Common Course-II	4	4	10	40	50
	Complementary Elective Course-II	4	6	10	40	50
	Core Course-II- Academic Writing, Methodology and Research Project	5	6	10	40	50
III	English Common Course-IV	4	5	10	40	50
	Additional Common Course-III	4	5	10	40	50
	Complementary Elective Course-III	4	6	10	40	50
	Core Course III- Old English to Medieval English Literature (500-1500)	3	4	10	40	50
	Core Course-IV- Renaissance and Restoration Literatures (1485-1780)	4	5	10	40	50
IV	English Common Course VI	4	5	10	40	50
	Additional Common Course-IV	4	5	10	40	50
	Complementary Elective Course-IV	4	6	10	40	50
	Core Course-V- The Romantic Period (1780-1832)	4	5	10	40	50
	Core Course VI- The Victorian Period (1832-1901)	3	4	10	40	50
V	Core Course VII- The Early Twentieth Century ((1901-1939)	4	6	10	40	50
	Core Course VIII- The Late Twentieth and Twenty-First Centuries(1939-2018)	5	6	10	40	50
	Core Course IX- Post colonial Literatures in English	5	6	10	40	50
	Core Course X- Linguistics	4	5	10	40	50

	Core Course XI- Project	2	1	5	20	25
	Generic Elective Course	2	2	5	20	25
VI	Core Course XII - Critical Theory	5	6	10	40	50
	Core Course XIII- Women's Writing	4	5	10	40	50
	Core Course XIV- Indian Writing in English	3	4	10	40	50
	Core Course XV- Film Studies	4	5	10	40	50
	Core Course XVI- Discipline Specific Elective	4	4	10	40	50
TOTAL		120	150	-	-	1500

TOTAL CREDIT (Sum of total credits of all semester): 120

TOTAL MARKS (Sum of total marks of all semester): 1500

(2019 ADMISSION ONWARDS)

Core Courses in English Language and Literature
Programme Specific Outcomes for BA in English Language and Literature

PSO 1. Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

PSO 2. Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

PSO 3. Understand and apply the extended meaning of “English Literature” to various post-colonial and other writings in English.

PSO 4. Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women’s Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

PSO 5. Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

B.A. ENGLISH LANGUAGE AND LITERATURE--CORE COURSES
WORK AND CREDIT DISTRIBUTION
PART -1 (CORE COURSES)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
1B01ENG	Malayalam Literature in English Translation	I	6	5	3
2B02ENG	Academic Writing, Methodology and Research Project	II	6	5	3
3B03ENG	Old English to Medieval English Literature (500-1500)	III	4	3	3
3B04ENG	Renaissance and Restoration Literatures (1485-1780)	III	5	4	3
4B05ENG	The Romantic Period (1780-1832)	IV	5	4	3
4B06ENG	The Victorian Period (1832-1901)	IV	4	3	3
5B07ENG	The Early Twentieth Century ((1901-1939)	V	6	4	3
5B08ENG	The Late Twentieth and Twenty-First Centuries(1939-2018)	V	6	5	3
5B09ENG	Postcolonial Literatures in English	V	6	5	3
5B10ENG	Linguistics	V	5	4	3
6B11ENG	Project	VI	1	2	--
6B12ENG	Critical Theory	VI	6	5	3
6B13ENG	Women's Writing	VI	5	4	3
6B14ENG	Indian Writing in English	VI	4	3	3
6B15ENG	Film Studies	VI	5	4	3
6B16ENG	Discipline Specific Elective	VI	4	4	3
TOTAL			-	64	



KANNUR UNIVERSITY
(Abstract)

B.Com Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

ACADEMIC BRANCH

No.Acad.C1/12281/2019

Dated, Civil Station P.O.,20.06.2019

- Read:-
1. U.O.No.Acad.C2/429/2017 dated.10-10-2017
 2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
 3. U.O.No.Acad.C2/429/2017 Vol.II dated.03-06-2019.
 4. The Minutes of the Meeting of the Board of Studies in Commerce (UG) held on 07.06.2019
 5. Syllabus of B.Com.Programme, submitted by the Chairperson, Board of Studies in Commerce (UG), dated 12.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2.The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed different phases of Syllabus Revision processes such as conducting the meetings of various Boards of Studies and Workshops, discussions etc.

3.The Revised Regulations for UG programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) were implemented with effect from 2019 Admission as per paper read (3) above.

P.T.O

4.As per paper read (4) above, the Board of Studies in Commerce (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Com Programme to be implemented with effect from 2019 Admission.

5.As per paper read (5) above, the Chairperson, Board of Studies in Commerce (UG) has submitted the final copy of the Scheme, Syllabus & Pattern of Question Papers of B. Com Programme for implementation with effect from 2019 Admission.

6.The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(i) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) for B.Com programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting before the Academic Council.

7.The Scheme, Syllabus & Pattern of Question Paper of B.Com.Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

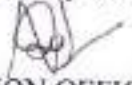
Sd/-
DEPUTY REGISTRAR(ACADEMIC)
for REGISTRAR

To
The Principals of Colleges offering B.Com Programme

- Copy to:-
1. The Examination Branch (through PA to CE)
 2. The Chairperson, Board of Studies in Commerce (UG)
 3. PS to VC/PA to PVC/PA to Registrar
 4. DR/AR-I, Academic
 5. The Computer Programmer(for uploading in the website)
 6. SF/DF/FC



Forwarded/By Order


SECTION OFFICER



KANNUR UNIVERSITY

BOARD OF STUDIES, COMMERCE (UG)

**SYLLABUS FOR
CORE COURSES, GENERAL AWARENESS COURSES,
COMPLEMENTARY ELECTIVE COURSES
FOR B.COM DEGREE PROGRAMME
AND GENERIC ELECTIVE COURSES**

CHOICE BASED CREDIT SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY

VISION AND MISSION

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

PROGRAMME OUTCOMES (PO)

PO 1.Critical Thinking:

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

INTRODUCTION

The Board of Studies of Commerce (UG) as per the direction of Kannur University has decided to introduce outcome based course syllabus for the undergraduate Programme in commerce with effect from the academic year 2019-20. The process of revising and restructuring the syllabus was undertaken in compliance with the national education policy of the University Grants Commission, the directions of the Kerala State Higher Education Council and Kannur University. This revised syllabus is the result of a series of meetings of the board of studies and workshop of college teachers conducted for this purpose. Suggestions and recommendations of scholars, teachers, students and other eminent persons in the area of commerce were taken in to consideration while drafting the new syllabus. Due care has been taken to make the new curriculum up to date, pertinent for the current scenario and in tune with the industrial requirements

I express my sincere gratitude to all members of the Board of Studies of commerce (UG), all scholars and faculty members who helped to fulfill this task.

Dr. RAJESH KUMAR .E. R
CHAIRMAN
Board of Studies, Commerce (UG)

KANNUR UNIVERSITY

PROGRAMME SPECIFIC OUTCOME OF B.COM DEGREE

After the successful completion of the B.Com Degree Programme, the students shall be able to;

PSO 1:

Understand the concepts and techniques of commerce and its application in business environment

PSO 2:

Conceive the ideas on entrepreneurship and develop the skills for setting up and management of business organizations

PSO 3:

Develop the skills and abilities to become competent and competitive in the business world

PSO 4:

Develop the competency to take wise decisions at personal and professional level

PSO 5:

Appraise the impact of other disciplines on the working of business

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KANNUR UNIVERSITY
B.COM DEGREE PROGRAMME

COURSE AND CREDIT DISTRIBUTION STATEMENT

Courses	No of Courses		Credit	
English Common Course (ECC)		4		14
Additional Common Course (ACC)		2		8
Core Courses:				
Discipline Specific Core Course (DSCC)	13	17	48	64
Discipline Elective Core Course (DECC)	4		16	
General Awareness Course (GAC)		4		16
Complimentary Elective Course (CEC)		4		16
Generic Elective Course (GEC)		1		2
Total		32		120

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title	Type of Course	Credits	Hours per week
I	English Common Course I	ECC	4	5
	English Common Course II	ECC	3	4
	Additional Common Course I	ACC	4	5
	Management Concepts and Principles (1B01 COM)	DSCC	4	5
	Business Statistics and Basic Numerical Skills(1A11 COM)	GAC	4	6
	TOTAL		19	25
II	English Common Course III	ECC	4	5
	English Common Course IV	ECC	3	4
	Additional Common Course II	ACC	4	5
	Functional Applications of Management (2B02 COM)	DSCC	4	5
	Quantitative Techniques for Business Decisions (2C01 COM)	CEC	4	6
	TOTAL		19	25
III	Entrepreneurship development (3A12 COM)	GAC	4	5
	Advanced Accounting (3B03 COM)	DSCC	4	6
	Course I from Elective Stream I/II/III/IV (3B04 COM)	DECC	4	5
	Business Regulatory Framework (3C02 COM)	CEC	4	4
	Business Economics (3C03 COM)	CEC	4	5
	TOTAL		20	25

Semester	Course Title	Type of Course	Credits	Hours per week
IV	General Informatics Skills (T+P) (4A13 COM)	GAC	4(3+1)	5(3+2)
	Environmental Studies and Disaster Management (4A14 COM)	GAC	4	5
	Corporate Accounting (4B05 COM)	DSCC	4	6
	Course II from Elective Stream I/II/III/IV (4B06 COM)	DECC	4	5
	Corporate Law and Business Regulations (4C04 COM)	CEC	4	4
	TOTAL		20	25
V	Business Research Methodology (5B07 COM)	DSCC	3	4
	Income Tax law and Practice (5B08 COM)	DSCC	4	5
	Cost Accounting (5B09 COM)	DSCC	4	5
	Banking Principles and Operations (5B10 COM)	DSCC	4	5
	Course III from Elective Stream I/II/III/IV (5B11 COM)	DECC	4	4
	Generic Elective Course (5D-- COM)	GEC	2	2
	TOTAL		21	25
VI	Financial Markets and Services (6B12 COM)	DSCC	3	4
	Management Accounting (6B13 COM)	DSCC	4	5
	Auditing and Corporate Governance (6B14 COM)	DSCC	4	5
	Income Tax and GST (6B15 COM)	DSCC	4	5
	Course IV from Elective Stream I/II/III/IV (6B16 COM)	DECC	4	4
	Project (6B17 COM)	DSCC	2	2
	TOTAL		21	25

Industrial Visit

The forth/fifth semester students of regular colleges shall be taken under the supervision of faculty members to business or industrial units so as to enable them to have a direct knowledge about location, layout, managerial function, HR management or any area of

study. The study tour to an industrial/business unit will form a part of the curriculum. The report submitted by the students in this respect shall be considered as one of the assignment of any one course in the concerned semester.

PART A:

B.COM CORE COURSES

WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
1B01 COM	Management Concepts and Principles	I	5	4	3
2B02 COM	Functional Applications of Management	II	5	4	3
3B03 COM	Advanced Accounting	III	6	4	3
3B04 COM	Elective Course I	III	5	4	3
4B05 COM	Corporate Accounting	IV	6	4	3
4B06 COM	Elective Course II	IV	5	4	3
5B07 COM	Business Research Methodology	V	4	3	3
5B08 COM	Income Tax law and Practice	V	5	4	3
5B09 COM	Cost Accounting	V	5	4	3
5B10 COM	Banking Principles and Operations	V	5	4	3
5B11 COM	Elective Course III	V	4	4	3
6B12 COM	Financial Markets and Services	VI	4	3	3
6B13 COM	Management Accounting	VI	5	4	3
6B14 COM	Auditing and Corporate Governance	VI	5	4	3
6B15 COM	Income Tax and GST	VI	5	4	3
6B16 COM	Elective Course IV	VI	4	4	3
6B17 COM	Project	VI	2	2	-

ELECTIVE STREAMS

I - CO-OPERATION

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Co-operative Principles	III	5	4	3
4B06 COM	Management of Co-operatives	IV	5	4	3
5B11 COM	Co-operative laws	V	4	4	3
6B16 COM	Co-operative Accounting and Legislations	VI	4	4	3

II - COMPUTER APPLICATION

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Introduction to Computers and Networks	III	5	4	3
4B06 COM	Data Base management System	IV	5	4	3
5B11 COM	Information Technology for Business	V	4	4	3
6B16 COM	Accounting Packages - TALLY	VI	4	4	3

III - FINANCE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Financial Management	III	5	4	3
4B06 COM	Investment Management	IV	5	4	3
5B11 COM	Goods and Service Tax	V	4	4	3
6B16 COM	Corporate Tax Planning	VI	4	4	3

IV - MARKETING

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Marketing Principles	III	5	4	3
4B06 COM	Consumer Behaviour	IV	5	4	3
5B11 COM	Promotion Management	V	4	4	3
6B16 COM	Market Research	VI	4	4	3

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	4	40*
INTERNAL	1	10

* 20 marks for theory and 20 marks for practical for courses having practical

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS	REMARKS
COMPONENT 1 Test paper	3	6	Minimum two test papers and mark should be awarded on the basis of average mark obtained by the student
COMPONENT 2 Assignments/ Seminar	2	4	Department should keep a record of the work done

Internal mark for test papers should be given as per the following criteria;

Average mark obtained in the test papers	Percentage of internal mark
80% and above	100%
60% to 79%	80%
40% to 59%	60%
20 % to 39%	40%
Below 20%	20%


KANNUR UNIVERSITY

(Abstract)

B.Com Programme -Scheme, Syllabus and Model Question Papers - Core/Complementary/Open Courses under Choice Based Credit Semester System-Implemented with effect from 2014 Admission - Orders issued.

ACADEMIC BRANCH

U.O No. Acad/C1/3544/2014

Dated, Civil Station (PO), 3-05-2014

- Read: 1. U.O.No.Acad/C2/2232/2014 dated 14/03/2014
2. Minutes of the meeting of the Board of Studies in Commerce UG held on 23-01-2014
3. Minutes of the meeting of the Faculties of Commerce and Management Studies held on 28-03-2014
4. Letter dated 28-03-2014 from the Chairman, Board of Studies Commerce UG

ORDER

1. The Revised Regulation for Choice based Credit Semester System have been implemented in this University with effect from 2014 admission vide paper read (1) above.

2. As per the paper read (2) above, Board of Studies in Commerce UG finalized the Scheme, Syllabus and Model Question Papers for B.Com Programmes under Choice Based Credit Semester System with effect from 2014 admission.

3.As per the paper read (3) above the meeting of Faculty of Commerce and Management Studies approved the Scheme, Syllabus and Model question papers for B.Com Programme with effect from 2014 admission.

4. The Chairman, Board of Studies in Commerce UG, vide paper (4) read above, has forwarded the Scheme, Syllabus & Model Question Papers for B.Com Programme for implementation with effect from 2014 admission.

5. The Vice Chancellor after considering the matter in detail and in exercise of the powers of Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement Scheme, Syllabus and Model Question Papers (Core/Complementary/Open Courses) for B.Com Programme under Choice Based Credit Semester System with effect from 2014 admission subject to report Academic Council.

6. Orders are, therefore, issued accordingly.

7. The Implemented Scheme, Syllabus and Model Question Papers are appended.

Sd/-
DEPUTY REGISTRAR (Academic)
For REGISTRAR

To,
The Principals of Colleges offering B.Com Programme

(PTO)

5/5/14

1. The Examination Branch (through PA to CE)
2. PS to VC/PA to /PA to Registrar /
3. Chairman BOS Commerce UG
4. PA to CE
5. DR/AR I Academic
6. SF/DF/FC.



Forwarded/ by Order

A handwritten signature in black ink, appearing to be 'S. S. S.', written over a horizontal line.

Section Officer

For more details; log on www.kannuruniversity.ac.in

SCHEME OF CORE COURSES									
Total Marks 1500 - Total Credits 120 - Working Days/Semester 90 - WorkingHrs/Semester 450									
Sl. No		Sem	Course Title	Type of Course	Mark	Credit	Hrs/Week		Hrs/Semester
1	1	I	1B01 COM Management Concepts & Principles	Core 1	50 (40+10)	2	3	11	54
2	2		1B02 COM Financial Accounting	Core 2	50 (40+10)	3	4		72
3	3		1C01 COM Bus. Statistics	Comp 1	50 (40+10)	3	4		72
4	1	II	2B03 COM Principles of Marketing	Core 3	50 (40+10)	2	3	11	54
5	2		2B04 COM Human Resource Management	Core 4	50 (40+10)	2	3		54
6	3		2C02COM Quantitative Tech. for Bus. Decision	Comp2	50 (40+10)	4	5		90
7	1	III	3A11 COM Disaster Management	Comm11	50 (40+10)	4	4	25	72
8	2		3A12 COM Numerical Skills for Business	Comm 12	50 (40+10)	4	4		72
9	3		3C03 COM Basics of Research Methodology	Comp 3	50 (40+10)	3	3		54
10	4		3B05 COM Advanced Accounting	Core 5	50 (40+10)	4	5		90
11	5		3B06 COM Optional I	Core 6	50 (40+10)	3	5		90
12	6		3C04 COM Business Regulatory Framework	Comp 4	50 (40+10)	3	4		72
13	1	IV	4A13 COM Entrepreneurship	Comm13	50 (40+10)	4	4	25	72
14	2		4A14 COM Environment Studies	Comm14	50 (40+10)	4	4		72
15	3		4B07 COM Income Tax Law & Practice I	Core 7	50 (40+10)	4	5		90
16	4		4B08 COM Informatics Skills (T+P)	Core 8	50 (20 + 20 +10)	3 (2+1)	4 (2+2)		72 (36+36)
17	5		4B09 COM/Optional II	Core 9	50 (40+10)	3	4		72

18	6		4C05 COM Corporate Law & Business Regulation	Comp 5	50 (40+10)	3	4		72
19	1	V	5B10 COM Cost Accounting	Core 10	50 (40+10)	4	5	25	90
20	2		5B11 COM Corporate Accounting	Core 11	50 (40+10)	4	5		90
21	3		5B12 COM Auditing	Core 12	50 (40+10)	3	4		72
22	4		5B13 COM Income Tax Law & Practice II	Core 13	50 (40+10)	4	5		90
23	5		5B14 COM Optional III	Core 14	50 (40+10)	3	4		72
24	6		5D01 COM Open Course	Open	50 (40+10)	2	2		36
25	1		VI	6B15 COM Management Accounting	Core 15	50 (40+10)	4		5
26	2	6B16 COM International Business		Core 16	50 (40+10)	4	5	90	
27	3	6B17 COM Modern Banking		Core 17	50 (40+10)	4	5	90	
28	4	6B18 COM Financial Markets & Services		Core 18	50 (40+10)	3	3	54	
29	5	6B19 COM Optional IV		Core 19	50 (40+10)	3	5	90	
30	6	6B20 COM Project		Project	50 (40+10)	2	2	36	
* Total					1500 (1200+300)	* 98			
No. of Courses		Type of Course		Credit	Mark				
4		Common		16	4x50= 200				
5		Complementary		16	5x50= 250				
19+1 Project		Core (62+2)		64	20x50= 1000				
1		Open		2	1 X 50 =50				
		* Total		* 98	1500				
4		English		14	200				
2		Additional Language		8	100				
36		Total		120	1800				

KANNUR UNIVERSITY
(Abstract)

BSc Chemistry / Polymer Chemistry/Bio Chemistry - Revised Scheme & Syllabi of Core, Complementary and Open Courses under Choice Based Credit Semester System for Under Graduate Programme - implemented with effect from 2014 admission - Orders Issued.

ACADEMIC BRANCH

No. Acad/C2/190/2014

Dated, Civil Station P.O, 28- 05-2014

Read: 1.U.O No. Acad/C2/2232/2014 dated 14-03-2014

2. Minutes of the meeting of the Board of Studies in Chemistry (UG) held on 01-01-2014.
3. Minutes of the meeting of the Faculty of Science held on 25-03-2014
4. Letter dated 29-03-2014 from the Chairman, BOS in Chemistry (UG).

ORDER

1. The Revised Regulations for UG Programmes under Choice based Credit Semester System were implemented in this University with effect from 2014 admission as per paper read (1) above.

2. As per paper read (2) above the Board of Studies in Chemistry finalized the Scheme, Syllabi & model Question Papers for Core, Complementary & open courses of BSc Chemistry/Polymer Chemistry/Bio Chemistry programmes to be implemented with effect from 2014 admission.

3. As per read (3) above the Faculty of Science held on 25-03-2014 approved Scheme, syllabi & model question papers for core/complementary & open courses of BSc Chemistry/Polymer Chemistry/Bio Chemistry programmes to be implemented with effect from 2014 admission.

4. The Chairman, Board of Studies in Chemistry (UG) vide paper read (4) above has submitted the finalized copy of Scheme, syllabi & Model question papers for core/complementary and open courses of BSc Chemistry/Polymer Chemistry/ Bio Chemistry programmes for implementation with effect from 2014 admission.

5. The Vice Chancellor, after examining the matter in detail, and in exercise of the powers of the Academic Council as per section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, has accorded sanction to implement the Revised scheme, syllabi & model question papers of BSc Chemistry/Polymer Chemistry/Bio Chemistry Programmes with effect from 2014 admission.

6. Orders, are therefore issued implementing the revised scheme, syllabi & model question papers for core, complementary & open courses of BSc Chemistry/Polymer Chemistry/Bio Chemistry programmes under CBCSS with effect from 2014 admission subject to report to Academic Council

7. Implemented revised Syllabi are appended.

SD/-
DEPUTY REGISTRAR (ACADEMIC)

FOR REGISTRAR

To

1. The Principals of Affiliated Colleges offering B.Sc Chemistry/ Polymer Chemistry/ Bio Chemistry Programmes
2. The Examination Branch (through PA to CE)

Copy To:

1. The Chairman, BOS Chemistry (UG)
2. PS to VC/PA to PVC/PA to Registrar
3. DR/AR I Academic
4. Central Library
5. SF/DF/FC.

Approved/By Order


Section Officer

❖ For more details log on to www.kannur_university.ac.in



KANNUR UNIVERSITY

COURSE STRUCTURE

&

SYLLABUS

FOR

UNDERGRADUATE PROGRAMME

IN

CHEMISTRY

CORE & COMPLEMENTARY

COURSES

CHOICE BASED CREDIT SEMESTER SYSTEM

w.e.f 2014 ADMISSION

Curriculum

Introduction

The B Sc degree programme in Chemistry aims to provide the students with an in-depth understanding of Chemical Sciences. The syllabus has been designed to stimulate the interest of the students in Chemistry and to equip them with a potential to contribute to the academic and industrial requirements of the society. The new updated syllabus is based on an interdisciplinary approach and is infused with a new vigour and depth. Chemistry being an experimental science, due importance is given to the development of laboratory and instrumentation skills.

The main objective is to provide to the students a deep understanding of the basic concepts of chemical sciences by acquiring the knowledge of terms, facts, concepts, processes, techniques and principles of the subject. It attempts to equip the students to cater to the industrial needs and to utilise them in the utmost practical manner.

The syllabus has been prepared after discussions with a number of faculty members in the subject and also after evaluating the existing syllabi of BSc, the new syllabi of XI & XII standards, the UGC model curriculum and syllabi of other Universities. The reference materials have been recommended after a thorough study. The revised course pattern, distribution of credits, scheme of evaluation and syllabus approved by the board are given below.

BSc Chemistry Programme

The BSc programme in Chemistry is offered in six semesters within a period of three academic years. The programme shall include four types of courses, viz.,

- Common course -English & Additional language (Code A)
- Core course(Code B)
- Complementary course(Code C)
- Open course(Code D)

The Common and Complementary courses will be conducted during semester I to IV and the Core courses from semester I to VI. Open course will be during V semester.

COURSE STRUCTURE FOR CHEMISTRY (UG) PROGRAMME

2014 ADMISSION

SEMESTER 1

No.	Title of the Course	Hours /week	Credit	Marks		
				IA	ESE	Total
1	Common Course I English I	5	4	10	40	50
2	Common Course 2 English II	4	3	10	40	50
3	Common Course - Additional Language Course I	4	4	10	40	50
4	Core Course 1 (Theoretical & Inorganic Chemistry)	2	2	10	40	50
5	Core Course 2, Practical I	2	-	-	-	-
6	Complementary 1 (Course I)	2	2	8	32	40
7	Complementary 1 Practical	2	-	-	-	-
8	Complementary 2 (Course I)	4	3	10	40	50
	Total	25	18	58	232	290

SEMESTER 2

No.	Title of the Course	Hours /week	Credit	Marks		
				IA	ESE	Total
1	Common Course 3 English III	5	4	10	40	50
2	Common Course 4 English IV	4	3	10	40	50
3	Common Course - Additional Language Course II	4	4	10	40	50
4	Core Course 3 (Analytical Chemistry)	2	2	10	40	50
5	Core Course 2, Practical I, Part II	2	3	10	40	50
6	Complementary 1 (Course II)	2	2	8	32	40
7	Complementary 1 (Course II) Practical	2	-	-	-	-
8	Complementary 2 (Course II)	4	3	10	40	50
	Total	25	21	68	272	340

SEMESTER 3

No.	Title of the Course	Hours /week	Credit	Marks		
				IA	ESE	Total
1	Common Course 5 English V	5	4	10	40	50
2	Common Course - Additional Language Course III	5	4	10	40	50
3	Core Course 4 (Organic Chemistry-I)	3	3	10	40	50
4	Core Course 5, Practical 2,Part I	2	-	-	-	-
5	Complementary 1 (Course III)	3	2	8	32	40
6	Complementary 1 (Course III) Practical	2	-	-	-	-
7	Complementary 2 (Course III)	5	3	10	40	50
	Total	25	16	48	192	240

SEMESTER 4

No.	Title of the Course	Hours /week	Credit	Marks		
				IA	ESE	Total
1	Common Course 6 English VI	5	4	10	40	50
2	Common Course - Additional Language Course IV	5	4	10	40	50
3	Core Course 6 (Organic Chemistry -II)	3	3	10	40	50
4	Core Course 5, Practical 2,Part II	2	3	10	40	50
5	Complementary 1 (Course IV)	3	2	8	32	40
6	Complementary 1 (Course IV) Practical	2	4	8	32	40
7	Complementary 2 (Course IV)	5	3	10	40	50
	Total	25	23	66	264	330

SEMESTER 5

No.	Title of the Course	Hours /week	Credit	Marks		
				IA	ESE	Total
1	Open Course	2	2	5	20	25
2	Core Course 7 (Inorganic Chemistry -I)	3	4	10	40	50
3	Core Course 8 (Inorganic Chemistry-II)	3	4	10	40	50
4	Core Course 9 (Physical Chemistry-I)	3	4	10	40	50
5	Core Course 10 (Physical Chemistry-II)	3	4	10	40	50
7	Core Course 11,Practical 3	5	-	-	-	-
8	Core Course 12, Practical 4	5	-	-	-	-
9	Core Course 13 Project/Industrial Visit	1	-	-	-	-
	Total	25	18	45	180	225

SEMESTER 6

No.	Title of the Course	Hours /week	Credit	Marks		
				IA	ESE	Total
1	Core Course 14 (Organic Chemistry-III)	4	4	10	40	50
2	Core Course 15 (Physical Chemistry-III)	3	3	10	40	50
3	Core Course 16 (Physical methods In Chemistry)	3	3	10	40	50
4	Core Course 17(Elective)	3	3	10	40	50
5	Core Course 18, Practical 5	3	3	10	40	50
6	Core Course 11& 12 Practical 3& 4	7	6	10+	40+	50+
				10	40	50
7	Core Course 13 Project Industrial Visit	2	2	4	16+	25
				5		
Total		25	24	74	301	375

Total Credit

120

Total Marks

1800

Scheme of Mark distribution - B Sc Chemistry Programme

Course	No.of Papers	Marks per paper	Total Marks
Common Course-English	6	50	300
Common Course-Addl.language	4	50	200
Complimentary Course-Physics	5(4 Theory +1Practical)	40	200
Complimentary Course-Mathematics	4	50	200
Core Course-Chemistry	17(12Theory +5Practicals)	50	850
Project	1	25	25
Open Course	1	25	25

Credit distribution - B Sc Chemistry programme (Semester I to VI)

Programme	Sem.	Common*		Core Chemistry	Complementary		Open	Total
		Eng	Addl.		Maths	Physics		
BSc (Chemistry)	I	4+3	4	2	3	2		18
	II	4+3	4	2+3	3	2		21
	III	4	4	3	3	2		16
	IV	4	4	3+3	3	2+4		23
	V			4+4+4+4			2	18
	VI			4+3+3+3+3+3+3+2				24
	Total		22	16	56	12	12	2

Components of Core (Chemistry)

The core courses of BSc Chemistry programme will consist of the following components.

- Theory
- Practical
- Project (Investigatory)
- Study tour (Visiting Factory/ science institute/laboratory).

Scheme of Core course (Chemistry)

No.	Semester	Course code	Title of the Course	Credits	Contact hr/week
1	I	1B01CHE	Theoretical and Inorganic Chemistry	2	2
2	II	2B03CHE	Analytical Chemistry	2	2
3	II	1B02CHE & 2B02CHE	*Core Course Practical I Volumetric Analysis	3	2—I Sem 2—II Sem
4	III	3B04CHE	Organic Chemistry-I	3	3
5	IV	4B06CHE	Organic Chemistry-II	3	3
6	IV	3B05CHE & 4B05CHE	*Core Course Practicals 2 Inorganic Qualitative Analysis	3	2—III Sem 2—IV Sem
7	V	5B07CHE	Inorganic Chemistry-I	4	3
8	V	5B08CHE	Inorganic Chemistry-II	4	3
9	V	5B09CHE	Physical Chemistry- I	4	3
10	V	5B10CHE	Physical Chemistry- II	4	3
11	VI	6B14CHE	Organic Chemistry III	4	4
12	VI	6B15CHE	Physical Chemistry III	3	4
13	VI	6B16CHE	Physical Methods in Chemistry	3	3
14	VI	6B17CHE	Elective	3	3
15	VI	5B11CHE & 6B11CHE	*Core Course Practicals 3 Gravimetric Analysis	3	5—V Sem 2—VI Sem
16	VI	5B12CHE & 6B12CHE	*Core Course Practicals 4 Organic Chemistry	3	5---V Sem 3---VI Sem
17	VI	6B18CHE	*Core Course Practicals5 Physical Chemistry	3	5
18	VI	5B13CHE & 6B13CHE	Project & Industrial Visit	2	1—Sem V 1---Sem VI

* External examination will be held at the end of II/ IV/VI semester

Scheme for Core Elective Course

No	Semester	Course code	Title of the course	Contact hour/Week	Credit
1	VI	6B17CHE-A	Environmental Chemistry	3	3
2	VI	6B17CHE-B	Applied Chemistry	3	3
3	VI	6B17CHE-C	Polymer Chemistry	3	3
4	VI	6B17CHE-D	NanoChemistry	3	3

Scheme--- Complementary Course (Chemistry)

No	Semester	Course code	Title of the course	Contact hour/week	Credit
1	I	1C01CHE	Chemistry (For Physical & Biological Sciences)	2	2
2	II	2C02CHE	Chemistry (For Physical & Biological Sciences)	2	2
3	III	3C03CHE(BS)	Chemistry (For Biological Science)	3	2
4	III	3C03CHE(PS)	Chemistry (For Physical Science)	3	2
5	IV	4C04CHE(BS)	Chemistry (For Biological Science)	3	2
6	IV	4C04CHE(PS)	Chemistry (For Physical Science)	3	2
5	I,II, III&IV	4C05CHE*	Complementary Chemistry practical	2	4

* External examination will be conducted at the end of IV semester.

Scheme of Open course

The open course is meant for all the students in the institution except the students of BSc Chemistry programme. External examination will be conducted at the end of Vth semester.

Options available for Open course (Chemistry)

No	Semester	Course code	Title of the course	Contact hour/ week	Credit
1	V	5D01CHE	Chemistry in Service to man	2	2
2	V	5D02CHE	Drugs-Use & Abuse	2	2
3	V	5D03CHE	Environmental Studies	2	2
4	V	5D04CHE	Nanomaterials	2	2

Evaluation pattern

Mark system will be followed instead of direct grading for each question. For each course in the semester letter grade, grade point and % of marks are introduced in 7-point indirect grading system as per KUCBCSSUG 2014. Accordingly 20% of the total marks in each course are for internal evaluation and the remaining 80% for external evaluation.

Internal Evaluation (Core , Complementary & Open)

Components with percentage of marks of Internal Evaluation of Theory

- Attendance-25%
- Test papers-50%
- Assignment/ Seminar/Viva-25%

Internal evaluation is conducted by the concerned Department in mark system. Marks secured for internal evaluation need be send to University.

External Evaluation (Core , Complementary & Open)

External assessment will include Theory, Practical and Project evaluation conducted by University after the completion of a semester. Duration of theory examination for Core & Complementary courses will be 3 hours, where as for Open course is 2 hours. The practical examination for Core & Complementary will be of 4 hour duration.

Project work:

Project works will be carried out in fifth and sixth semesters. Not more than five students can form a group and undertake a project. Each individual student should submit a copy of the project report duly attested by the supervising teacher and Head of the

department. The report has to be presented at the time of practical examination conducted at the end of VI semester for evaluation.

Study tour:

Students are required to visit a factory/Laboratory/Research Institute of repute during the course and have to submit the report of the study tour at the end of the sixth semester during the time of practical examination. No credit will be separately given for study tour report.

Practical record, Project report & Study tour report must be certified by the teacher in charge and countersigned by the Head of the Department. Students should submit certified record of respective practical work at the time of University practical examination.

Mark distributions

Table 1: Internal and External marks for Core (Chemistry) courses:

Item	Marks		Total
	Internal	External	
Theory	10	40	50
Practical	10	40	50
Industrial visit	--	5	5
Project	4	16	20

Table 2: Internal and External marks for Complementary (Chemistry)

Item	Marks		Total
	Internal	External	
Theory	8	32	40
Practical	8	32	40

Table 3: Internal and External marks for Open Course (Chemistry)

Item	Marks		Total
	Internal	External	
Theory	5	20	25

Table 4: Distribution of Internal marks for Theory courses (Core, Complementary & Open).

Attendance	25%
Assignment /Seminar/Viva	25%
*Test paper	50%

* At least two test papers are to be conducted and average of these two is to be taken for awarding mark.

Table 5: Distribution of Internal marks for Practical courses

Attendance	25%
Record + Lab involvement*	50%
Test papers	25%

*On completion of each experiment, a report should be presented to the course teacher. It should be recorded in a bound note-book. The experimental description should include aim, principle, materials/apparatus required/used, method/procedures, and tables of data collected, equations, calculations, graphs, and other diagrams etc. as necessary and final results.

Table 6: Distribution of internal and external marks for Project

Internal (20% of Total)	%	External (80 % of total)	%
Punctuality	20 %	Relevance of Topic/Statement of Objectives and Methodology	20%
Use of data	20%	Presentation/Quality of analysis and findings	30 %
Scheme and Organization of report	30%	Viva Voce	50%
Viva Voce	30 %		

Criteria for awarding marks for Attendance:

Table 7: Distribution of marks for attendance

Attendance %	Marks%
Above 90%	100%
85 to 89%	80%
80 to 84%	60%
76 to 79%	40%
75%	20%

Grading of students

Internal marks alone need to be sent to the University. External examination will be conducted and assessed by the University using mark system. The semester wise performance called SGPA(Semester Grade Point Average) and overall performance on completion of the programme called CGPA (Cumulative Grade Point Average) of a student will be made by the University by taking the marks of internal and external assessments using a 7 Point Indirect Grading System as per KUCBCSSUG 2014. Finally an overall letter grade (called Cumulative Grade) for the entire programme will be awarded by the University. For the detailed calculations of SGPA, CGPA & Overall letter grade readers are directed to refer KUCBCSSUG 2014.

Table 8: Seven Point Indirect Grading System.

Marks	Grade	Interpretation	Grade point average	Range of grade	Class
90 and above	A+	Outstanding	6	5.5 - 6	First class with distinction
80 to 89	A	Excellent	5	4.5 - 5.49	
70 to 79	B	Very good	4	3.5 - 4.49	First class
60 to 69	C	Good	3	2.5 - 3.49	
50-59	D	Satisfactory	2	1.5 - 2.49	Second class
40-49	E	Adequate	1	0.5 - 1.49	Pass
Below 40	F	Failure	0	0.0 - 0.49	Fail

Distribution of Marks & type of questions for Core (Chemistry), Complementary (Chemistry) & Open (Chemistry) courses.

Table 9. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

Table 10. Type of Questions & Marks for External Examination- Complementary Chemistry

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Essay	4	2	5	10
	20	14		32

Table 11. Type of Questions & Marks for External Examination - Open Course

	Total Questions	No. Of Questions to be answered	Mark for each Marks for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	5	3	2	6
Short essay/Problems	5	3	3	9
Total	15	11		20

Distribution of marks for the practical examination:

The distribution of marks will be decided by the concerned Board of Examinations.

ANNEXURE I

Guidelines for the Evaluation of Projects

1. Evaluation of the Project Report shall be done under Mark System.
2. The evaluation of the project will be done at two stages:
 - a) Internal Assessment (supervising teachers will assess the project and award internal Marks)
 - b) External evaluation (external examiner appointed by the University)
 - c) Marks secured for the project will be awarded to candidates, combining the internal and external Marks

3. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

Internal(20% of total)		External(80% of Total)	
Components	% of internal Marks	Components	% of external Marks
Punctuality	20	Relevance of the Topic, Statement of Objectives, Methodology (Reference/ Bibliography)	20
Use of Data	20	Presentation, Quality of Analysis/Use of Statistical tools, Findings and recommendations	30
Scheme/Organization of Report	30	Viva-Voce	50
Viva-Voce	30		

4. Internal Assessment should be completed 2 weeks before the last working day of VIth semester.
5. Internal Assessment marks should be published in the department.
8. Project evaluation shall be done in the VI semester along with practical exams.
9. Chairman Board of Examinations, may at his discretion, on urgent requirements, make certain exception in the guidelines for the smooth conduct of the evaluation of project.

2. PASS CONDITIONS-

1. Submission of the Project Report and presence of the student for viva are compulsory for internal evaluation. No marks shall be awarded to a candidate if she/he fails to submit the Project Report for external evaluation.
2. The student should get a minimum of 40 % marks for pass in the project.
3. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re- done and the report may be re-submitted along with subsequent exams through parent department.



KANNUR UNIVERSITY

(Abstract)

B Sc Chemistry/ B.Sc.Biochemistry/B.Sc.Polymer Chemistry Programmes -Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad/C2/12380/2019

Civil Station P.O Dated 20/06/2019

- Read:-
1. U.O.No.Acad.C2/429/2017 dt.10-10-2017
 2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
 3. U.O No.Acad.C2/429/2017 Vol.II dt.03-06-2019
 4. The Minutes of the meeting of the Board of Studies in ChemistryUG held on 07-06-2019
 5. The Syllabus submitted by the Chairperson, Board of Studies in Chemistry (UG)dated 13/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.
2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies, Workshops and discussions.
3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.
4. Subsequently, as per paper read (4) above, the Board of Studies in Chemistry (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc.Chemistry/B.Sc. Biochemistry/ B.Sc.Polymer Chemistry Programmes to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Chemistry (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc. Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry programmes.
6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) of B.Sc Chemistry, B.Sc Biochemistry and B.Sc Polymer Chemistry programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in Affiliated colleges with effect from 2019 Admission, subject to reporting to the Academic Council.
7. The Scheme, Syllabus & Pattern of Question Papers of B.Sc Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry Programmes are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR(ACADEMIC)
for REGISTRAR

To

The Principals of Colleges offering B.Sc Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry programme

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Chemistry (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC



Forwarded/By Order

SECTION OFFICER



KANNUR UNIVERSITY

BOARD OF STUDIES, CHEMISTRY (UG)

SYLLABUS FOR CHEMISTRY CORE COURSE

COMPLEMENTARY ELECTIVE COURSE AND GENERIC ELECTIVE COURSES

FOR BSc CHEMISTRY PROGRAMME

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

ANNEXURE (i)
KANNUR UNIVERSITY
VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

ANNEXURE (ii)**KANNUR UNIVERSITY****PROGRAMME OUTCOMES (PO)****PO 1.Critical Thinking:**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

The syllabus is prepared based on an interdisciplinary approach and aim to provide the students a deep understanding of the basic concepts of chemical sciences by acquiring the knowledge of terms, facts, concepts, processes, techniques and principles of the subject. It attempts to equip the students to cater to the industrial needs and to utilise them in the utmost practical manner.

The updated syllabus is prepared based on Kannur University Regulations for Choice Based Credit and Semester System for Under-Graduate Programme 2019” (in OBE – Outcome Based Education – system) (KUCBCSSUG 2019) with a view to implement outcome based education (OBE) and curriculum from the academic year 2019 -20 onwards as proposed by higher education agencies .

An OBE curriculum means, starting with a clear picture of what is important for students to be able to do, then organizing the curriculum, instruction and assessment to make sure this learning ultimately happens. Intended learning outcomes (POs, PSOs and COs) which specify what graduates completing BSc Chemistry programme are expected to know, understand and be able to do at the end of their programme of study were discussed at various stages in three day OBE workshop conducted by KSHEC Trivandrum associated with Kannur University. These learning outcomes (POs, PSOs and COs) were further discussed along with content of the syllabus and assessment methods at the workshops conducted for faculty members and other stakeholders for restructuring curriculum by Kannur University and finalised after consulting with intellectuals, academicians, faculty members, researchers and students

The B Sc degree programme in Chemistry designed for students to attain the intended learning outcomes which specified as PSOs (Programme Specific Outcome) and COs (Course Outcome) are clearly stated in the syllabus.

The mission and vision statements and PO statements of the University were given at the beginning of the syllabus and PSO statements before the scheme of the syllabus. The CO statements are given in the beginning of each of the courses. Teachers need to aware these statements as these describe the desired educational accomplishments of the degree programs. The reference materials have been recommended after a thorough study. The revised course pattern, distribution of credits, scheme of evaluation and syllabus approved by the board are given.

There are many personalities whose support and guidance made this restructured syllabus a reality. I express my profound gratitude to the members of the Board of Studies (UG) in Chemistry who provided me extensive personal and professional support during the work of restructuring this syllabus. With immense pleasure and gratitude I remember the untiring support rendered by the faculty members of Chemistry from various Colleges of Kannur University, academic community and all other stake holders who worked for preparing this restructured syllabus and curriculum.

Saheed VK

Chairperson

Board of Studies, Chemistry(UG), Kannur University.

Kannur University**BSc Chemistry Programme****Programme Specific Outcomes (PSOs)**

After successful completion of three year degree program in Chemistry a student should be able to;

PSO 1 Understand the fundamental concepts, principles and processes underlying the academic field of chemistry, its different subfields (analytical, inorganic, organic and physical), and its linkages with related disciplinary areas/subjects;

PSO 2 Demonstrate procedural knowledge that creates different types of professionals in the field of chemistry and related fields such as pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.;

PSO 3Employ critical thinking and the scientific method to design, carry out, record and analyze the results of chemical experiments and get an awareness of the impact of chemistry on the environment and the society.

PSO 4 Use chemical techniques relevant to academia and industry, generic skills and global competencies, including knowledge and skills that enable students to undertake further studies in the field of chemistry or a related field, and work in the chemical and non-chemical industry sectors.

PSO5 Undertake hands on lab work and practical activities which develop problem solving abilities required for successful career in pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.

PSO 6Understand safety of chemicals, transfer and measurement of chemical, preparation of solutions, and find out the green route for chemical reaction for sustainable development.

PSO 7 Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

COURSE STRUCTURE FOR CHEMISTRY (UG) PROGRAMME
2019 ADMISSION

SEMESTER I

No.	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course I	5	4	10	40	50
2	English Common Course II	4	3	10	40	50
3	Additional Common Course I	4	4	10	40	50
4	Core Course 1 (Theoretical & Inorganic Chemistry)	2	2	10	40	50
5	Core Course 2 Practical I Part 1	2	-	-	-	-
6	Complementary Elective -I (Course I)	2	2	8	32	40
7	Complementary Elective Practical	2	-	-	-	-
8	Complementary Elective -II (Course I)	4	3	10	40	50
	Total	25	18	58	232	290

SEMESTER-II

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course III	5	4	10	40	50
2	English Common Course IV	4	3	10	40	50
3	Additional Common Course- II	4	4	10	40	50
4	Core Course 3 (Analytical and Inorganic chemistry- I)	2	2	10	40	50
5	Core Course 2, Practical I - Part 2	2	3	10	40	50
6	Complementary Elective – I (Course II)	2	2	8	32	40
7	Complementary Elective Practical	2	-	-	-	-
8	Complementary Elective -II (CourseII)	4	3	10	40	50
	Total	25	21	68	272	340

SEMESTER-III

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course V	5	4	10	40	50
2	Additional Common Course- III	5	4	10	40	50
3	Core Course4 (Organic Chemistry I)	3	3	10	40	50
4	Core Course 5 Practical 2,Part I	2	-	-	-	-
5	Complementary Elective -1(CourseIII)	3	2	8	32	40
6	Complementary Elective Practical	2	-	-	-	-
7	Complementary Elective -II (CourseIII)	5	3	10	40	50
	TOTAL	25	16	48	192	240

SEMESTER-IV

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course VI	5	4	10	40	50
2	Additional Common Course- IV	5	4	10	40	50
3	Core Course 6(Organic Chemistry II)	3	3	10	40	50
4	Core Course 5 Practical 2,Part II	2	3	10	40	50
5	Complementary Elective -1(CourseIV)	3	2	8	32	40
6	Complementary Elective Practical	2	4	8	32	40
7	Complementary Elective -II (CourseIV)	5	3	10	40	50
	TOTAL	25	23	66	264	330

SEMESTER-V

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	Generic Elective Course	2	2	5	20	25
2	Core Course 7 Analytical and Inorganic Chemistry-II	3	4	10	40	50
3	Core Course 8 (Inorganic Chemistry)	3	4	10	40	50
4	Core Course 9 (Physical Chemistry-I)	3	4	10	40	50
5	Core Course 10 (Physical Chemistry-II)	3	4	10	40	50
6	Core Course 11, Practical 3	5	-	-	-	-
7	Core Course 12, Practical 4	5	-	-	-	-
8	Core Course 13 Project/Industrial Visit	1	-	-	-	-
	TOTAL	25	18	45	180	225

SEMESTER-VI

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	Core Course 14 (Organic Chemistry-III)	4	4	10	40	50
2	Core Course 15 (Physical Chemistry-III)	4	3	10	40	50
3	Core Course 16 (Physical methods In Chemistry)	3	3	10	40	50
4	Core Course 17 Discipline Specific Elective Course	3	3	10	40	50
5	Core Course 18, Practical 5	3	3	10	40	50
6	Core Course 11& 12 Practical 3& 4	7	6	10+ 10	40+ 40	50+ 50
7	Core Course 13 Project Industrial Visit	1	2	4	16+ 5	25
	TOTAL	25	24	74	301	375

First Complementary Elective –Physics, Second Complementary Elective-Mathematics

Total Credit 120

Total Marks 1800

[Type text]

Scheme of Mark distribution - B Sc Chemistry Programme

Course	No.of Papers	Marks per paper	Total Marks
English Common Course	6	50	300
Additional Common Course	4	50	200
Complementary Elective Course -Physics	5(4 Theory +1Practical)	40	200
Complementary Elective Course -Mathematics	4	50	200
Core Course-Chemistry	17(12Theory +5Practicals)	50	850
Project	1	25	25
Generic Elective Course	1	25	25

Credit distribution - B Sc Chemistry Programme (Semester I to VI)

Programme	Sem.	Common*		Core Chemistry	Complementary Elective Course		Generic Elective Course	Total
		Eng	Addl		Mathematics	Physics		
BSc (Chemistry)	I	4+3	4	2	3	2		18
	II	4+3	4	2+3	3	2		21
	III	4	4	3	3	2		16
	IV	4	4	3+3	3	2+4		23
	V			4+4+4+4			2	18
	VI			4+3+3+3+3+3+3+2				24
	Total		22	16	56	12	12	2

Components of Core (Chemistry)

The core courses of BSc Chemistry Programme will consists of the following components.

Theory
 Practical
 Project (Investigatory)
 Study tour (Visiting Factory/ science institute/laboratory).

Scheme of Core course (Chemistry)

No.	Semester	Course code	Title of the Course	Credits	Contact hr/week
1	I	1B01CHE	Theoretical and Inorganic Chemistry	2	2
2	II	2B03CHE	Analytical and Inorganic chemistry-I	2	2
3	II	1B02CHE/PCH & 2B02CHE/PCH	*Core Course Practical I Volumetric Analysis	3	2—I Sem 2—II Sem
4	III	3B04CHE/PCH	Organic Chemistry-I	3	3
5	IV	4B06CHE/PCH	Organic Chemistry-II	3	3
6	IV	3B05CHE/PCH & 4B05CHE/PCH	*Core Course Practicals 2 Inorganic Qualitative Analysis	3	2—III Sem 2—IV Sem
7	V	5B07CHE/PCH	Analytical and Inorganic chemistry-II	4	3
8	V	5B08CHE/PCH	Inorganic Chemistry	4	3
9	V	5B09CHE/PCH	Physical Chemistry- I	4	3
10	V	5B10CHE/PCH	Physical Chemistry- II	4	3
11	VI	6B14CHE/PCH	Organic Chemistry III	4	4
12	VI	6B15CHE/PCH	Physical Chemistry III	3	4
13	VI	6B16CHE/PCH	Physical Methods in Chemistry	3	3
14	VI	6B17CHE/PCH	Discipline Specific Elective Course	3	3
15	VI	5B11CHE/PCH & 6B11CHE/PCH	*Core Course Practicals 3 Gravimetric Analysis	3	5—V Sem 4—VI Sem
16	VI	5B12CHE/PCH & 6B12CHE/PCH	*Core Course Practicals 4 Organic Chemistry	3	5---V Sem 3---VI Sem
17	VI	6B18CHE/PCH	*Core Course Practicals5 Physical Chemistry	3	3
18	VI	5B13CHE/PCH & 6B13CHE/PCH	Project & Industrial Visit	2	1—SemV 1---Sem VI

* External examination will be held at the end of II/ IV/VI semester

Scheme for Discipline Specific Elective Course

No	Semester	Course code	Title of the course	Contact hour/Week	Credit
1	VI	6B17CHE/PCH-A	Environmental Chemistry	3	3
2	VI	6B17CHE/PCH-B	Applied Chemistry	3	3
3	VI	6B17CHE/PCH-C	Polymer Chemistry	3	3
4	VI	6B17CHE/PCH-D	NanoChemistry	3	3

Scheme for Complementary Elective Course (Chemistry)

No	Semester	Course code	Title of the course	Contact hour/week	Credit
1	I	1C01CHE/PCH	Chemistry (For Physical & Biological Sciences)	2	2
2	II	2C02CHE/PCH	Chemistry (For Physical & Biological Sciences)	2	2
3	III	3C03CHE/PCH(BS)	Chemistry (For Biological Science)	3	2
4	III	3C03CHE/PCH(PS)	Chemistry (For Physical Science)	3	2
5	IV	4C04CHE/PCH(BS)	Chemistry (For Biological Science)	3	2
6	IV	4C04CHE/PCH(PS)	Chemistry (For Physical Science)	3	2
5	I,II, III&IV	4C05CHE*/PCH	Complementary Elective Course practical	2	4

* External examination will be conducted at the end of IV semester.

Scheme of Generic Elective Course

The Generic Elective course is meant for all the students in the institution except the students of BSc Chemistry Programme. External examination will be conducted at the end of Vth semester.

Options available for Generic Elective course (Chemistry)

No	Semester	Course code	Title of the course	Contact hour/ week	Credit
1	V	5D01CHE/PCH	Chemistry in Service to man	2	2
2	V	5D02CHE/PCH	Drugs-Use & Abuse	2	2
3	V	5D03CHE/PCH	Environmental Studies	2	2
4	V	5D04CHE/PCH	Nanomaterials	2	2
5	V	5D05CHE/PCH	Chemistry in Every day life	2	2

Evaluation pattern

Mark system will be followed instead of direct grading for each question. For each course in the semester letter grade, grade point and % of marks are introduced in 7-point indirect grading system as per KUCBCSSUG 2019. Accordingly 20% of the total marks in each course are for internal evaluation and the remaining 80% for external evaluation.

Internal Evaluation (Core , Complementary Elective & Generic Elective)
Components with percentage of marks of Internal Evaluation of theory

Test papers-60%

Seminar/Viva-40%

Internal evaluation is conducted by the concerned Department in mark system. Marks secured for internal evaluation need be send to University.

External Evaluation (Core , Complementary Elective & Generic Elective)

External assessment will include Theory, Practical and Project evaluation conducted by University after the completion of a semester. Duration of theory examination for Core & Complementary courses will be 3 hours, whereas for Generic Elective course is 2 hours. The practical examination for Core Course Practical I- Volumetric Analysis will be 3 hours and other Core & Complementary Elective practical exam will be of 4 hour duration.

Project work:

Project works will be carried out in fifth and sixth semesters. Not more than five students can form a group and undertake a project. Each individual student should submit a copy of the project report duly attested by the supervising teacher and Head of the department. The report has to be presented at the time of practical examination conducted at the end of VI semester for evaluation.

Study tour:

Students are required to visit a factory/Laboratory/Research Institute of repute during the course and have to submit the report of the study tour at the end of the sixth semester

[Type text]

during the time of practical examination. No credit will be separately given for study tour report.

Practical record, Project report & Study tour report must be certified by the teacher in charge and countersigned by the Head of the Department. Students should submit certified record of respective practical work at the time of University practical examination.

Mark distributions

Table 1: Internal and External marks for Core (Chemistry) courses:

Item	Marks		Total
	Internal	External	
Theory	10	40	50
Practical	10	40	50
Industrial visit	--	5	5
Project	4	16	20

Table 2: Internal and External marks for Complementary Elective Course (Chemistry)

Item	Marks		Total
	Internal	External	
Theory	8	32	40
Practical	8	32	40

Table 3: Internal and External marks for Generic Elective Course (Chemistry)

Item	Marks		Total
	Internal	External	
Theory	5	20	25

Table 4: Distribution of Internal marks for Theory courses (Core, Complementary Elective & Generic Elective)

Seminar/Viva	40%
*Test paper	60 %

* At least two test papers are to be conducted and average of these two is to be taken for awarding mark.

Table 5: Distribution of Internal marks for Practical courses

Record + Lab involvement*	50%
Test papers/ Viva	50%

*On completion of each experiment, a report should be presented to the course teacher. It should be recorded in a bound note-book. The experimental description should include aim, principle, materials/apparatus required/used, method/procedures, and tables of data collected, equations, calculations, graphs, and other diagrams etc. as necessary and final results.

Table 6: Distribution of internal and external marks for Project

Internal (20% of Total)	%	External (80 % of total)	%
Punctuality	20 %	Relevance of Topic/Statement of Objectives and Methodology	20%
Use of data	20%	Presentation/Quality of analysis and findings	30 %
Scheme and Organization of report	30%	Viva Voce	50%
Viva Voce	30 %		

Distribution of Marks & type of questions for Core Course

Marks including choice:

Unit	Marks

Table 7. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

Distribution of Marks & type of questions for Complementary Elective Course
Marks including choice:

Unit	Marks

Table 8. Type of Questions & Marks for External Examination- Complementary Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Essay	4	2	5	10
	20	14		32

Distribution of Marks for Generic Elective Course
Marks including choice:

Unit	Marks

Table 9. Type of Questions & Marks for External Examination –Generic Elective Course

	Total Questions	No. Of Questions to be Answered	Mark for each Marks for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	5	3	2	6
Short essay/Problems	5	3	3	9
Total	15	11		20

[Type text]

Guidelines for the Evaluation of Projects

1. Evaluation of the Project Report shall be done under Mark System.
2. The evaluation of the project will be done at two stages:
 - a) Internal Assessment (supervising teachers will assess the project and award Internal Marks)
 - b) External evaluation (external examiner appointed by the University)
 - c) Marks secured for the project will be awarded to candidates, combining the Internal and External Marks
3. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

Internal(20% of total)		External(80% of Total)	
Components	% of internal Marks	Components	% of internal Marks
Punctuality	20	Relevance of the topic, Statement of Objectives Methodology (Reference/ Bibliography)	20
Use of Data	20	Presentation, Quality of Analysis/Use of Statistical tools, Findings and recommendations	30
Scheme/Organization of Report	30	Viva-voce	50
Viva-Voce	30		

4. Internal Assessment should be completed 2 weeks before the last working day of VIth semester.
5. Internal Assessment marks should be published in the department.
6. Project evaluation shall be done in the VI semester along with practical exams.
7. Chairman Board of Examinations, may at his discretion, on urgent requirements, make certain exception in the guidelines for the smooth conduct of the evaluation of project.

2. PASS CONDITIONS-

1. Submission of the Project Report and presence of the student for viva are compulsory for internal evaluation. No marks shall be awarded to a candidate if she/he fails to submit the Project Report for external evaluation.
2. The student should get a minimum of 40 % marks of the aggregate and 40% separately for ESE and 10% CE for pass in the project.
3. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re-done and the report may be re-submitted along with subsequent exams through parent department.

(Abstract)

B.Sc Mathematics Programme - Revised syllabus and model question paper under Choice Based Credit Semester System - Implemented w.e.f 2017 admissions - Orders Issued.

ACADEMIC C SECTION

No. Acad/C2/ 4762 /2014

Dated, Civil Station P.O, 23-05-2017

Read: 1. U.O of Even No. dated 12.05.2014

2. Minutes of the meeting of the BOS in Mathematics (UG) held on 20.12.2016.

3. Email from the Chairman , BOS in Mathematics (UG) dated 22.05.2017

ORDER

1. As per paper read (1) above, the scheme syllabus and pattern of question papers for core, complementary and open courses in B.Sc. Mathematics programme were implemented in the university w.e.f 2014 admission.

2. The meeting of the BOS in Mathematics (UG) held on 20.12.2016 vide paper read (2) above has recommended to incorporate certain modifications in the core papers 1B01MAT, 2B02MAT, 3B03MAT, 4B04MAT, 5B09MAT of B.Sc. Mathematics programme to be implemented w.e.f 2017 admissions.

3. The Chairman, Board of Studies in Mathematics (UG) vide paper read (3) above has submitted the revised syllabus of the core papers 1B01MAT, 2B02MAT, 3B03MAT, 4B04MAT, 5B09MAT of B.Sc. Mathematics programme to be implemented w.e.f 2017 admissions.

4. The Vice Chancellor, after examining the matter in detail, and in exercise of the powers of the Academic Council as per section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, has accorded sanction to implement with effect from 2017 admission, the revised syllabus of B.Sc. Mathematics programme incorporating the changes as recommended by the Board of Studies in Mathematics(UG), subject to report to the Academic Council.

P.T.O

5. The modified pages of syllabus and model question papers are appended for reference.
6. U.O as per the paper read (1) above, stands modified to this extent.
7. Orders, are therefore issued accordingly.

Sd/-
**JOINT REGISTRAR (ACADEMIC)
FOR REGISTRAR**

To

1. The Principals of the Affiliated Colleges offering B.Sc Mathematics course.

Copy To:

1. The Chairman, BOS in Mathematics (UG)
2. PS to VC/PA to PVC/PA to Registrar/PA to CE
3. JR/AR I Academic
4. SF/DF/FC.

Forwarded/By Order



Section Officer



For more details; log on www.kannuruniversity.ac.in



KANNUR UNIVERSITY
(Abstract)

B.Sc. Mathematics Programme-Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/13083/2019

Civil Station P.O, Dated 22/06/2019

- Read:-
1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
 2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
 3. U.O No. Acad.C2/429/2017 Vol.II dated 03-06-2019
 4. The Minutes of the Meeting of the Board of Studies in Mathematics held on 06/06/2019
 5. Syllabus of B.Sc. Mathematics Submitted by the Chairperson, Board of Studies in Mathematics (UG)dated 21/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes, such as conducting the meeting of various Boards of Studies, Workshops, discussion etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Mathematics (UG) finalized the Scheme, Syllabus & Pattern of Question Papers for Core, Complementary Elective & Generic Elective Course of B.Sc.Mathematics Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Mathematics(UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc.Mathematics Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Papers (Core/Complementary Elective/Generic Elective Course) of the B.Sc.Mathematics programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Papers of the B.Sc. Mathematics Programme are uploaded in the University website (www.kannuruniversity.ac.in)


Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering B.Sc. Mathematics programme

- Copy to:-
1. The Examination Branch (through PA to CE)
 2. The Chairperson, Board of Studies in Mathematics (UG)
 3. PS to VC/PA to PVC/PA to Registrar
 4. DR/AR-I, Academic
 5. The Computer Programmer (for uploading in the website)
 6. SF/DF/FC

Forwarded/By Order


SECTION OFFICER





KANNUR UNIVERSITY

BOARD OF STUDIES, MATHEMATICS (UG)

**SYLLABUS FOR
MATHEMATICS CORE COURSE,
COMPLEMENTARY ELECTIVE COURSES
AND GENERIC ELECTIVE COURSES**

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY

VISION AND MISSION STATEMENTS

Vision

To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavours.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

PROGRAMME OUTCOMES (PO)

PO 1. Critical Thinking

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2. Effective Citizenship

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3. Effective Communication

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4. Interdisciplinarity

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

Modern education is facing challenges to cater to the requirements of the expanding world of knowledge and information. Research studies in Basic Sciences, especially in Mathematics is to be encouraged in our country. Novel developments in the field of Mathematics are to be incorporated into the syllabus so as to cope with the challenges of ever growing field of knowledge.

The UG Board of Studies in Mathematics has designed a syllabus that familiarizes the students with the basic concepts of the subject. It helps the students to meet the current employment requirements and provides them ample scope for further study in the subject. The syllabi for Core Courses, Complementary Elective Courses and Generic Elective Courses promote self learning through assignments, seminars and project work in addition to class room learning.

The syllabus and curriculum has been prepared after concerted efforts and deliberations at various levels and it meets the programme specific outcomes. The reference materials have been recommended after a thorough study. The Board of Studies puts forward this syllabus for implementation from 2019 admission onwards. We thank all those who have helped us by giving critical suggestions for improvement.

Dr. C.P. Santhosh
Chairman
UG Board of Studies in Mathematics
Kannur University

KANNUR UNIVERSITY
PROGRAMME SPECIFIC OUTCOMES OF
B.SC. MATHEMATICS PROGRAMME

- PSO 1:** Understand the basic concepts and tools of Mathematical logic, Set theory, Number theory, Geometry, Calculus, Algebra, Abstract structures, Linear Algebra, Analysis, Laplace transforms, Fourier series, Graph theory, and Optimization and methods of proofs.
- PSO 2:** Model real world problems into Mathematical problems and find solutions and understand the application of Mathematics in other Sciences and Engineering.

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KANNUR UNIVERSITY
BSc MATHEMATICS PROGRAMME
WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title	Credits	Hours per week	Total Credits	Total Hours
I	English Common Course 1	4	5	20	25
	English Common Course 2	3	4		
	Additional Common Course 1	4	4		
	Core Course 1	4	4		
	First Complementary Elective Course 1	3	4		
	Second Complementary Elective Course 1	2	4		
II	English Common Course 3	4	5	20	25
	English Common Course 4	3	4		
	Additional Common Course 2	4	4		
	Core Course 2	4	4		
	First Complementary Elective Course 2	3	4		
	Second Complementary Elective Course 2	2	4		
III	English Common Course 5	4	5	17	25
	Additional Common Course 3	4	5		
	Core Course 3	4	5		
	First Complementary Elective Course 3	3	5		
	Second Complementary Elective Course 3	2	5		
IV	English Common Course 6	4	5	21	25
	Additional Common Course 4	4	5		
	Core Course 4	4	5		
	First Complementary Elective Course 4	3	5		
	Second Complementary Elective Course 4 (T+P)	6(2+4)	5		
V	Core Course 5	4	4	21	25
	Core Course 6	4	5		
	Core Course 7	4	5		
	Core Course 8	3	4		
	Core Course 9	4	5		
	Generic Elective Course	2	2		
VI	Core Course 10	4	5	21	25
	Core Course 11	4	5		
	Core Course 12	4	5		
	Core Course 13	4	5		
	Core Course 14 (Discipline Specific Elective Course)	3	5		
	Project	2	---		
Total				120	

CREDIT DISTRIBUTION STATEMENT

Course	Credit
English Common Course	22
Additional Common Course	16
Core Course	56
First Complementary Elective Course - Statistics	12
Second Complementary Elective Course - Physics/Computer Science	12
Generic Elective Course	2
Total	120

2

KANNUR UNIVERSITY
(Abstract)

BSc Physics Programme - Revised Scheme, Syllabus & Model Question Papers of Core, Complementary and Open Courses under Choice Based Credit Semester System for Under Graduate Programme - implemented with effect from 2014 admission - Orders Issued.

ACADEMIC BRANCH

No. Acad/C2/886/2014

Dated, Civil Station P.O, 20-05-2014

Read: 1. U.O No. Acad/C2/2232/2014 dated 14-03-2014

2. Minutes of the meeting of the Board of Studies in Physics (UG) held on 01-01-2014

3. Minutes of the meeting of the Faculty of Science held 25-03-2014

4. Letter dated 23-01-2014 from the Chairman, BOS in Physics (UG)

ORDER

1. The Revised Regulations for UG Programme under Choice based Credit Semester System were implemented in this University with effect from 2014 admission as per paper read (1) above.

2. As per paper read (2) above the Board of Studies in Physics (UG) finalized the Scheme, Syllabus & model Question Papers for Core, Complementary & open courses of BSc Physics programme to be implemented with effect from 2014 admission.

3. As per read (3) above the Faculty of Science held on 25-03-2014 approved Scheme, syllabus & model question papers for core/complementary & open courses of BSc Physics programme to be implemented with effect from 2014 admission.

4. The Chairman, Board of Studies in Physics (UG) vide paper read (4) above has submitted the finalized copy of Scheme, syllabus & Model question papers for core/complementary and open courses of BSc Physics programme for implementation with effect from 2014 admission.

5. The Vice Chancellor, after examining the matter in detail, and in exercise of the powers of the Academic Council as per section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised scheme, syllabus & model question papers of BSc Physics Programme with effect from 2014 admission.

6. Orders, are therefore issued implementing the revised scheme, syllabus & model question papers for core, complementary & open courses of BSc Physics programme under CBCSS with effect from 2014 admission subject to report to Academic Council

7. Implemented revised Syllabus is appended.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
FOR REGISTRAR

To

1. The Principals of Affiliated Colleges offering B.Sc Physics Programme
2. The Examination Branch (through PA to CE)

Copy To:

1. The Chairman, BOS Physics (UG)
2. PS to VC/PA to PVC/PA to Registrar
3. DR/AR I Academic
4. Central Library
5. SE/DF/FC.

Forwarded/By Order



[Signature]
Section Officer

❖ For more details log on to www.kannur.university.ac.in

[Handwritten mark]

KANNUR UNIVERSITY

SCHEME & SYLLABUS OF

UG (PHYSICS)

Based on Kannur University regulations: KUCBCSSUG 2014

(Kannur University Choice Based Credit Semester System for Under Graduate system 2014)

BSc Core (Physics), Complementary (Physics) & Open (Physics) courses

(With effect from 2014 admissions)



Contents

- ❖ **Curriculum of BSc (Physics) Programme**
- ❖ **Scheme of Core (Physics), Complementary (Physics) & Open(Physics) courses**
- ❖ **Assessment pattern of Core(Physics), Complementary(Physics) & Open(Physics) courses**
- ❖ **Pattern of theory external examination Question papers – Core (Physics), Complementary (Physics), & Open (Physics) courses.**
- ❖ **Syllabi of**
 - **Core(Physics),**
 - **Complementary(Physics) &**
 - **Open(Physics) courses**
- ❖ **Model question papers of Core (Physics), Complementary (Physics), & Open (Physics) courses**

Curriculum of BSc (Physics) Programme

Scope: By doing the BSc (Physics) programme students are aimed at developing interest in physics in order to continue further in the field of physics or to attain the necessary physics and allied background which an employer needs.

The BSc (Physics) programme curriculum consists of:

- Common (English) courses & Common (Additional language-Optional) courses
- Core (Physics) courses
- Complementary I (Maths) & Complementary II (Optional) courses
- Open (Optional) course

For the definitions of the terms mentioned above readers are requested to refer the UG regulations-2014 of Kannur University (KUCBCSSUG-2014) available at the website www.kannuruniversity.ac.in.

The Common (English), Common (Addl. language) & Complementary courses will be conducted during semester I to IV. The Core courses will span from semester I to VI. Open course will be during V semester alone.

Credit & Mark distribution of BSc (Physics) Programme

Total credits for the BSc (Physics) programme will be 120 & total marks: 1800 distributed through six semesters with the following details.

Table 1: Distribution of Credits & Marks for the BSc (Physics) programme.

Item	Credits	Marks
Common course (English)	22	300
Common(Addl. language) Optional	16	200
Complementary I(Maths)	12	200
Complementary II(Optional)	12	200
Core(Physics) courses	56	875
Open(Optional) course	2	25
Total	120	1800

Table 2: Semester wise Credit & Mark distribution of BSc (Physics) programme:

Sem.	Common		Core Physics	Complementary		Open	Total Credits	Total Marks
	Eng	Addl.		Maths	Compl.II			
I	4+3	4	3	3	2		19	290
II	4+3	4	3	3	2		19	290
III	4	4	3	3	2		16	240
IV	4	4	3+4	3	2+4		24	330
V			3+3+3+3+3			2	17	275
VI			3+3+3+3+3+4+4+2				25	375
Total	22	16	56	12	12	2	120	1800

Table 2(a):

SEMESTER I						
S No.	Title of the course	Hrs/week	Credits	Marks		
				IA**	ESE***	Total
1	Common course (English) I	5	4	10	40	50
2	Common course (English) II	4	3	10	40	50
3	Common course(Addl. language) VII	4	4	10	40	50
4	Core course (Theory-1B01PHY)	2	3	10	40	50
5	Core course (Practical I-4B05PHY)*	2	-	-	-	-
6	Complementary (I) Theory I (Maths)	4	3	10	40	50
7	Complementary (II) Theory I	2	2	8	32	40
8	Complementary (II) Practical I *	2	-	-	-	-
Total		25	19	58	232	290

*External examination at the end of fourth semester

Internal assessment ; * End Semester Examination (external assessment)

Table 2(b):

SEMESTER II						
S No	Title of the course	Hrs/week	Credits	Marks		
				IA	ESE	Total
1	Common course (English) III	5	4	10	40	50
2	Common course (English) IV	4	3	10	40	50
3	Common course(Addl. language) VIII	4	4	10	40	50
4	Core course (Theory-2B02PHY)	2	3	10	40	50
5	Core course (Practical I-4B05PHY)*	2	-	-	-	-
6	Complementary (I) Theory II(Maths)	4	3	10	40	50
7	Complementary (II) Theory II	2	2	8	32	40
8	Complementary (II) Practical *	2	-	-	-	-
Total		25	19	58	232	290

*External examination at the end of fourth semester

Table 2(c):

SEMESTER III						
S No.	Title of the course	Hrs/week	Credits	Marks		
				IA	ESE	Total
1	Common course (English) V	5	4	10	40	50
2	Common course(Addl. language) IX	5	4	10	40	50
3	Core course (Theory-3B03PHY)	3	3	10	40	50
4	Core course (Practical I-4B05PHY)*	2	-	-	-	-
5	Complementary (I) Theory III(Maths)	5	3	10	40	50
6	Complementary (II) Theory III	3	2	8	32	40
7	Complementary (II) Practical *	2	-	-	-	-
Total		25	16	48	192	240

*External examination at the end of fourth semester

Table 2(d):

SEMESTER IV						
S No.	Title of the course	Hrs/week	Credits	Marks		
				IA	ESE	Total
1	Common course (English) VI	5	4	10	40	50
2	Common course(Addl. language) X	5	4	10	40	50
3	Core course (Theory-4B04PHY)	3	3	10	40	50
4	Core course (Practical I -4B05PHY)	2	4	10	40	50
5	Complementary (I) Theory IV(Maths)	5	3	10	40	50
6	Complementary (II) Theory IV	3	2	8	32	40
7	Complementary (II) Practical	2	4	8	32	40
Total		25	24	66	264	330

Table 2(e):

SEMESTER V						
S No.	Title of the course	Hrs/week	Credits	Marks		
				IA	ESE	Total
1	Open course	2	2	5	20	25
2	Core course (Theory-5B06PHY)	3	3	10	40	50
3	Core course (Theory-5B07PHY)	3	3	10	40	50
4	Core course (Theory-5B08PHY)	3	3	10	40	50
5	Core course (Theory-5B09PHY)	3	3	10	40	50
6	Core course (Theory-5B10PHY)	3	3	10	40	50
7	Core course (Practical II -6B16PHY)!	4	-	-	-	-
8	Core course (Practical III -6B17PHY)! 	4	-	-	-	-
Total		25	17	55	220	275

! External examination at the end of sixth semester

Table 2(f):

SEMESTER VI						
S No.	Title of the course	Hrs/week	Credits	Marks		
				IA	ESE	Total
1	Core course (Theory -6B11PHY	3	3	10	40	50
2	Core course (Theory-6B12PHY)	3	3	10	40	50
3	Core course (Theory-6B13PHY)	3	3	10	40	50
4	Core course (Theory-6B14PHY)	3	3	10	40	50
5	Core course (Theory-6B15PHY) - Elective	3	3	10	40	50
6	Core course (Practical II-6B16PHY)	4	4	10	40	50
7	Core course (Practical III-6B17PHY)	4	4	10	40	50
8	Project (6B18PHY)	2	2	5	20	25
9	Study tour (6B19PHY)	-	-	-	-	-
Total		25	25	75	300	375

Components of Core (Physics)

The core courses of BSc (Physics) programme will consist of the following components.

- Theory
- Practical
- Project (Investigatory)
- Study tour (Visiting science institute/laboratory).

Objectives of theory, Practical, Project & Study tour

- **Theory courses:** The design of the theory syllabus is to lay the foundations of physics by learning the history, concepts involved, its language (mathematics), problem solving, and theoretical/experimental developments in various branches of Physics.
- **Practical courses:** To verify the theory they have learned using the laboratory, to develop skill (ability to handle apparatus) there by making them confident to handle delicate instruments, to perform precise measurements in future, data analysis by drawing graph, error analysis, computer based skill & to realize limitation of experimental measurements. In other words it aims at the needs that an employer expects from a physics graduate/ to prepare them for scientific research.
- **Project:** To develop investigation aptitude in Physics/Life. Selection of the topic for the project must be based on the physics (theory/experimental) they have learned through Semesters I to IV. The topic may be theoretical, experimental or a combination of both. Besides familiarisation of books/journals, familiarisation of software such as Mathematica, Matlab, Origin, Grapher, Latex etc. are also expected.
It also aims at promoting scientific report writing practice*
- **Study tour:** Visiting of a science institute is aimed to get an awareness/idea of the set up/working/research occurring in institutes/laboratory.

Components of complementary physics will include theory and practical; Open course will have theory only.

*A commonly accepted form of an investigatory project report in science/physics will include:

- (1) An introductory section containing a brief historical development of theory/experimental background, objectives and relevance of the present investigation.
- (2) The present work &
- (3) Discussion of results he/she has obtained, conclusion & bibliography.

Scheme of Core (Physics), Complementary (Physics) & Open (Physics)

The distribution of various courses, course code, credits, marks & contact hours (known as scheme) for core physics, complementary physics, and open physics will be as follows.

(i) Scheme of Core (Physics)

For Core (Physics), total credits: 56 & total marks: 875

Table 3. Scheme: BSc (Physics)-Core

S No	Sem ester	Course code	Title of Course	Credits	Hrs/w eek	Marks!		
						IA	ESE	total
1	I	1B01PHY	Physics primers	3	2	10	40	50
2	II	2B02PHY	Electronics-I	3	2	10	40	50
3	III	3B03PHY	Allied Physics	3	3	10	40	50
4	IV	4B04PHY	Optics	3	3	10	40	50
5	I,II, III, IV	4B05PHY *	Practical 1	4	2	10	40	50
6	V	5B06PHY	Electrodynamics-I	3	3	10	40	50
7	V	5B07PHY	Thermal Physics	3	3	10	40	50
8	V	5B08PHY	Classical Mechanics & Relativity	3	3	10	40	50
9	V	5B09PHY	Python programming	3	3	10	40	50
10	V	5B10PHY	Atomic, Nuclear and Particle Physics	3	3	10	40	50
11	VI	6B11PHY	Electrodynamics- II	3	3	10	40	50
12	VI	6B12PHY	Photonics&Spectroscopy	3	3	10	40	50
13	VI	6B13PHY	Quantum mechanics	3	3	10	40	50
14	VI	6B14PHY	Electronics-II	3	3	10	40	50
15	VI	6B15PHY **	Elective	3	3	10	40	50
16	V,VI	6B16PHY ***	Practical II	4	4	10	40	50
17	V,VI	6B17PHY ***	Practical III	4	4	10	40	50
18	VI	6B18PHY ***	Project	2	2	5	20	25
19	V or VI	6B19PHY!!	Study tour	-	-	-	-	-

* External examination (ESE) will be held at the end of IV semester

** Options available are listed in Table 3(a): 6B15PHY (Elective)

*** External examination (ESE) will be held at the end of VI semester

! For detailed distribution of marks, see the section: Assessment pattern

!! Audit course: Course for which no credits are awarded.

Table-3(a) Options available for elective course (6B15PHY) :

S No	Title of the course
1	A. Plasma Physics.
2	B.Astronomy & Astrophysics
3	C. Atmospheric Physics
4	D. Nanoscience
5	E. Material Science
6	F.Computational Physics

(ii) Scheme of Complementary Physics courses

Table-4 Scheme of Complementary (Physics) courses:

Complementary (Physics) courses are expected to provide physics back ground for students of other BSc programmes. Total credits: 12 & total marks: 200, distributed as per the table given below.

S No	Semester	Course code	Title of the course	Hrs/week	Credits	Marks*		
						IA	ESE	total
1	I	1C01PHY	Complementary Physics I (Mechanics)	2	2	8	32	40
2	II	2C02PHY	Complementary Physics II (Electricity, Magnetism and Thermal Physics)	2	2	8	32	40
3	III	3C03PHY	Complementary Physics III (Optics and Photonics)	3	2	8	32	40
4	IV	4C04PHY	Complementary Physics IV (Modern Physics and Electronics)	3	2	8	32	40
5	I,II,III &IV	4C05PHY **	Complementary Physics practical	2	4	8	32	40

*For detailed distribution of marks, see the section: Assessment pattern

** External examination will be conducted at the end of IV semester.

(iii) Scheme of Open course-Physics

The open course is meant for all the students in the institution except the students of BSc (Physics) programme. Motivation behind open course is that integration of concepts/theories/techniques from two or more disciplines will enable to advance understanding / solve problems whose solutions are beyond the scope of a single discipline. External examination will be conducted at the end of V semester.

Total credits: 2; Total marks: 25.

Table 5: Scheme of Open course-Physics:

S No	Sem ester	Course code	Title of the course	Hrs/we ek	Cre dits	Marks*		
						IA	ESE	total
1	V	5D01PHY	Open course **	2	2	5	20	25

* For detailed distribution of marks, see the section: Assessment pattern

**Table 5(a): Options available for Open course (Physics)

S No	Title of the course
1	A. Environmental Physics
2	B. Joy of star watching
3	C. Disaster Management
4	D. Biophysics

Assessment pattern

A general pattern of assessment as per KUCBCSSUG 2014 will be followed. Accordingly 20% of the total marks will be reserved for internal assessment (IA) and the remaining 80% through external examination (ESE). It is applicable for Core, Complementary and Open courses as well.

Internal assessment (Core (physics), Complementary (physics) & Open (physics)):

Internal assessment will include

- Regularity in attending the classes (Attendance)
- Test papers
- Assignment
- Seminar
- Viva

Internal assessment is continuous throughout the semester and to be conducted by the concerned Department in mark system.

Objectives of Attendance/Test paper/Assignment/Seminar/Viva:

- **Attendance:** To develop punctuality in students.
- **Test paper:** To assess the hard work/understanding of the subject and thereby to induce students the need for hard work in life.....
- **Assignments:** The objectives of assignment in general are to increase the knowledge/ to promote the abilities and skills of the students/ to extend what they know in to new situations/to develop the traits for developing physics/ to reinforce what students have already learned/ to prepare them for forthcoming complex lessons....
- **Seminar:** During a seminar assigned readings are discussed, questions raised and debates conducted in order to promote the interaction aspects of life...
- **Viva voce:** It is a measure of student's understanding of a subject/their ability to verbally explain the subject to others. (During viva voce a student may be made to face a group of teachers rather than a single teacher as far as possible)...

Topics for Assignment /Seminar/Viva

Students must be encouraged to familiarise with as much books/Journals/e-journals/internet resources as possible through assignment /seminar/viva. Topics for assignment/Seminar/viva for internal assessment may be given so as to induce them the various traits demanded by the term "Education". It must include topics such as **disaster management, drug abuse, alcoholism, de addiction centres, messages for abstention drug**, besides the subject area in order to remind their social commitments/prevention of social evils.

The total number of test papers/assignment/seminar/viva that may be conducted during a semester is decided by the concerned department depending on the time available/ student's capacity.

External assessment (Core (physics), Complementary (physics), &Open (physics)):

External assessment will include Theory, Practical & Project evaluation conducted by University after the completion of a semester called end semester examination (ESE). Duration of theory examination for Core (Physics) & Complementary (physics) courses will be 3 hours, where as for Open (physics) course is 2 hours. The practical examination for Core (Physics) & Complementary (physics) will be of 3 hour duration. Evaluation of the project will be made along with practical examination of core(Physics).

Practical log book: of students must be submitted to the external examiners during their University practical examination.

Project report & Study tour report: Students have to submit their project report & report of the study tour along with practical examination. No credit will be given for study tour report.

Practical log book, Project report & Study tour report must be certified by the teacher in charge and countersigned by the Head of the Department.

Table 6: Distribution of internal marks for Theory courses (Core, Complementary & Open).

Attendance	25%
*Assignment /Seminar/Viva	25%
**Test paper	50 %

* A minimum of one general assignment and one physics assignment are to be conducted and average mark is to be taken.

** At least two test papers are to be conducted and average of these two is to be taken for awarding marks.

Table 7: Distribution of internal marks for Practical courses (Core &Complementary)

Attendance	25%
* Record + **Lab involvement	50%
Test papers	25%

*A student is required to maintain a log book of their practical works which must include a brief theory of the each experiment, observations, tabulation, calculation, graph, result etc., regularly signed by the teacher in charge. Fair record is not required.

**Students may be asked to write a brief report (brief theory, formula, diagram/ circuit diagram, model graph) of each experiment before they enter in to the laboratory. Students must be encouraged to draw a sketch of the apparatus/instruments before they start doing the experiment for better familiarisation.

Table 8: Distribution of internal and external marks for Project

Internal (20% of total)	%	External (80 % of total)	%
Punctuality	20 %	Relevance of topic/statement of objectives and Methodology	20%
Use of data	20%	Presentation/Quality of analysis and findings	30 %
Scheme and organization of report	30%	Viva voce	50%
Viva voce	30 %		

Criteria for awarding marks for Attendance:

Table 9: Distribution of marks for attendance

Attendance %	Marks%
Above 90%	100%
85 to 89%	80%
80 to 84%	60%
76 to 79%	40%
75%	20%

Grading of students

Internal marks alone need to be sent to the University. External examination will be conducted and assessed by the University using mark system. The semester wise performance called SGPA(Semester Grade Point Average) and overall performance on completion of the programme called CGPA (Cumulative Grade Point Average) of a student will be made by the University by taking the marks of internal and external assessments using a 7 Point Indirect Grading System (table 10) as per KUCBCSSUG 2014. Finally an overall letter grade (called Cumulative Grade) for the entire programme will be awarded by the University. For the detailed calculations of SGPA, CGPA & Overall letter grade readers are directed to refer KUCBCSSUG 2014.

Table 10: Seven Point Indirect Grading System.

% Marks	Grade	Interpretation	Grade point average	Range of grade	Class
90 and above	A+	Outstanding	6	5.5 - 6	First class with distinction
80 to 89	A	Excellent	5	4.5 - 5.49	
70 to 79	B	Very good	4	3.5 - 4.49	First class
60 to 69	C	Good	3	2.5 - 3.49	
50-59	D	Satisfactory	2	1.5 - 2.49	Second class
40-49	E	Adequate	1	0.5 - 1.49	Pass
Below 40	F	Failure	0	0.0 - 0.49	Fail

Distribution of Marks & type of questions for Core (Physics), Complementary (Physics) & Open (Physics) courses.

Table 11. Type of questions & Marks for external examination (theory) - Core Physics

Type of questions	No. of questions	No. of questions to be answered	Marks for each question	Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Long essay	4	2	5	10
Total	24	17		40

Distribution of marks & appointment of examiners for the external practical examination (Core Physics):

The distribution of marks for the external practical examination of core (Physics) will be decided by the concerned Board of examinations. There will be two examiners for the external practical and project examination.

Table 12. Type of Questions & Marks for external examination (theory) - Complementary Physics:

Type of questions	No. of questions	No. of questions to be answered	Mark for each question	Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Long essay	4	2	5	10
Total	20	14		32

Distribution of marks & appointment of examiners for the external practical examination (Complementary Physics):

Distribution of marks for the external practical examination of complementary physics will be decided by the concerned Board of Examinations. There will be two examiners for the external practical examination.

Table 13. Type of Questions & marks for external examination (theory) - Open course (Physics):

Type of questions	Total questions	No. of questions to be answered	Marks for each question	Marks
Very short answer	5	5	1	5
Short answer	5	3	2	6
Short essay/Problems	5	3	3	9
Total	15	11		20



KANNUR UNIVERSITY
(Abstract)

B.Sc. Physics Programme-Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/12291/2019

Dated, Civil Station P.O 21/ 06/ 2019

- Read:-
1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
 2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
 3. U.O.No. Acad.C2/429/2017 Vol.II dated 03-06-2019
 4. The Minutes of the Meeting of the Board of Studies in Physics(UG) held on 06/06/2019
 5. Syllabus of B.Sc Physics Programme Submitted by the Chairperson, Board of Studies in Physics (UG) dated 12.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG Programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies and Workshops, discussion etc.

3. The Revised Regulation for UG Programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently ,as per paper read (4) above, the Board of Studies in Physics (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc. Physics Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Physics (UG) submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc. Physics Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper (Core/Complementary Elective/Generic Elective Course) of B.Sc. Physics Programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.Sc. Physics Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering B.Sc. Physics programme

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in B.Sc. Physics (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer (for uploading in the website)
6. SF/DF/FC



Forwarded/By Order


SECTION OFFICER



KANNUR UNIVERSITY

BOARD OF STUDIES -PHYSICS (UG)

**SYLLABUS FOR PHYSICS CORE,
COMPLEMENTARY ELECTIVE
& GENERIC ELECTIVE COURSES
OF BSc PROGRAMME**

**CHOICE BASED CREDIT AND SEMESTER SYSTEM
(OBE – Outcome Based Education – system)**

(2019 ADMISSION ONWARDS-)

KANNUR UNIVERSITY
VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY
PROGRAMME OUTCOMES (PO)

PO 1.Critical Thinking:

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

The Board of Studies in Physics (UG) strives to offer students with a solid scientific and technical foundation and to promote them to build up vision in tackling problems and seeking solutions through the reformed outcome based curriculum and syllabus. This curriculum and syllabus clearly states the graduate attributes/outcomes and is developed after numerous workshops and discussions with different stakeholders.

The B.Sc. Physics degree course will open up exciting higher studies/employment opportunities for students. The course offers essential knowledge in theoretical Physics as well as practical knowledge to the students to apply it in real-life state of affairs. B.Sc. Physics aspirant needs to have basic knowledge in mathematical tools and techniques to pursue various courses in this programme.

The teachers should place much greater emphasis on supporting curricular activities aimed for achieving the desired attributes and programme outcomes, even if these are not part of the end semester examinations. Rote learning should be discouraged. The act of seeking new information and creation of new knowledge should be encouraged.

Appropriate three-day induction programmes/bridge courses can be offered to the first year B.Sc. Physics students to cope with the UG programme in Physics. The concerned Department/Institution has a flexibility to frame/adopt the bridge courses by adjusting the teaching hours accordingly.

The Board of Studies in Physics (UG) considered the introduction of outcome based curriculum and syllabus in affiliated colleges for the UG programme in Physics and resolved to implement the same from 2019 admission onwards.

Sheela M Joseph
Chairperson
Board of Studies, Physics (UG)
Kannur University

Kannur University
Programme Specific Outcome of BSc Physics Programme

PSO1: Understand and apply the principles of Classical mechanics, Quantum mechanics, Thermodynamics, Nuclear physics and Electrodynamics

PSO 2: Understand and apply the principles of Solid state physics, Optics, Photonics and Spectroscopy

PSO 3: Understand the principles of Electronics, Design and test electronic circuits

PSO 4: Understand and apply the principles of Mathematical Physics and Computational Physics and do Error analysis in measurements

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KANNUR UNIVERSITY BSc PHYSICS PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

(BSc:Common English: 22, Additional Common: 16, Core: 56,

First complementary Elective: 12,Second complementary Elective:12, Generic Elective: 2)

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	Common Course(English)I	4	5	18	25
	Common Course(English)II	3	4		
	Common Course (Addl Lang) VII	4	4		
	Core Course(Theory 1B01PHY)	2	2		
	Core Course(Practical 4B05PHY*)	-	2		
	First Complementary Elective Theory Maths I	3	4		
	Second Complementary Elective Theory I	2	2		
Second Complementary Elective Practical I *	-	2			
II	Common Course(English)III	4	5	18	25
	Common Course(English)IV	3	4		
	Common Course (Addl Lang) VIII	4	4		
	Core Course(Theory 2B02PHY)	2	2		
	Core Course(Practical 4B05PHY*)	-	2		
	First Complementary Elective Theory Maths II	3	4		
	Second Complementary Elective Theory II	2	2		
Second Complementary Elective Practical I *	-	2			
III	Common Course(English)V	4	5	16	25
	Common Course (Addl Lang) IX	4	5		
	Core Course(Theory 3B03PHY)	3	3		
	Core Course(Practical 4B05PHY*)	-	2		
	First Complementary Elective Theory Maths III	3	5		
	Second Complementary Elective Theory III	2	3		
	Second Complementary Elective Practical I *	-	2		
IV	Common Course(English)VI	4	5	24	25
	Common Course (Addl Lang) X	4	5		
	Core Course(Theory 4B04PHY)	3	3		
	Core Course(Practical 4B05PHY)	4	2		
	First Complementary Elective Theory Maths IV	3	5		
	Second Complementary Elective Theory IV	2	3		
	Second Complementary Elective Practical I	4	2		

V	Generic Elective Course!!	2	2	17	25
	Core Course (Theory-5B06PHY)	4	4		
	Core Course (Theory-5B07PHY)	4	4		
	Core Course (Theory-5B08PHY)	4	4		
	Core Course (Theory-5B09PHY)	3	3		
	Core Course (Practical II-6B15PHY**)	-	4		
	Core Course (Practical III 6B16PHY**)	-	4		
VI	Core Course (Theory-6B10PHY)	4	4	27	25
	Core Course (Theory-6B11PHY)	4	4		
	Core Course (Theory-6B12PHY)	4	4		
	Core Course (Theory-6B13PHY)	3	3		
	Discipline Specific elective 6B14PHY)	2	2		
	Core Course (Practical II-6B15PHY)	4	4		
	Core Course (Practical III 6B16PHY)	4	4		
	Project&Study Tour*** 6B17PHY	2	-		
Total				120	150

* External examination will be conducted at the end of Fourth Semester

** External examination will be conducted at the end of Sixth Semester

*** Study tour report (Industrial visit/ Scientific Institution visit) should be submitted along with the project report

!!Generic elective courses offered by Physics is shown in PART C

First Complementary Elective (Compulsory): Mathematics

Second Complementary Elective: Chemistry/ Electronics/ Computer Science

**PART A:
PHYSICS CORE COURSES
WORK AND CREDIT DISTRIBUTION**

(2019 ADMISSION ONWARDS)

Course code	Course title	Sem	Hours per week	Credit	Exam hours	Marks		
						CE	ESE	Total
1B01PHY	MECHANICS I	I	2	2	3	10	40	50
2B02PHY	MATHEMATICAL PHYSICS AND ERROR ANALYSIS	II	2	2	3	10	40	50
3B03PHY	MECHANICS II	III	3	3	3	10	40	50
4B04PHY	ELECTRONICS I	IV	3	3	3	10	40	50
4B05PHY	GENERAL PHYSICS PRACTICAL I*	IV	2	4	3	10	40	50
5B06PHY	QUANTUM MECHANICS	V	4	4	3	10	40	50
5B07PHY	ELECTROSTATICS AND MAGNETOSTATICS	V	4	4	3	10	40	50
5B08PHY	THERMODYNAMICS AND STATISTICAL MECHANICS	V	4	4	3	10	40	50
5B09PHY	ELECTRONICS II	V	3	3	3	10	40	50
6B10PHY	SOLID STATE PHYSICS AND SPECTROSCOPY	VI	4	4	3	10	40	50
6B11PHY	OPTICS AND PHOTONICS	VI	4	4	3	10	40	50
6B12PHY	NUCLEAR, PARTICLE & ASTROPHYSICS	VI	4	4	3	10	40	50
6B13PHY	ELECTRODYNAMICS AND CIRCUIT THEORY	VI	3	3	3	10	40	50
6B14PHY	DISCIPLINE SPECIFIC ELECTIVE !	VI	2	2	3	10	40	50
6B15PHY	GENERAL PHYSICS PRACTICAL II**	VI	4	4	3	10	40	50
6B16PHY	ELECTRONICS PRACTICAL III**	VI	4	4	3	10	40	50
6B17PHY	PROJECT*** & STUDY TOUR	VI	-	2	-	5	20	25

*External examination will be conducted at the end of Fourth Semester

** External examination will be conducted at the end of Sixth Semester

***External examination will be conducted at the end of Sixth Semester.

Study tour report (Industrial visit/ Scientific Institution visit) should be submitted along with the project report.

!Options available are listed in table I

Table I

COURSE CODE	COURSE TITLE
6B14 PHY(1)	PYTHON PROGRAMMING
6B14 PHY(2)	NANOSCIENCE
6B14 PHY(3)	MATERIAL SCIENCE
6B14 PHY(4)	COSMOLOGY
6B14 PHY(5)	PLASMA PHYSICS

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

CONTINUOUS INTERNAL ASSESSMENT-THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT 1 Test paper	60%	Best of two
COMPONENT 2 Open book problem solving/Seminar/Viva	40%	One

CONTINUOUS INTERNAL ASSESSMENT- PRACTICAL

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT 1 Lab Skill	25%	
COMPONENT 2 Punctuality	25%	
COMPONENT 3 Record	25%	A logbook of practicals should be maintained which must include theory, observation, tabulation, calculation, graph, result etc
COMPONENT 4 Examination	25%	A model exam should be conducted before external examination & considered for internals

CONTINUOUS INTERNAL ASSESSMENT- PROJECT

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT 1 Topic	20%	Relevance of topic
COMPONENT 2 Punctuality	20%	
COMPONENT 3 Scheme & report	20%	
COMPONENT 4 Viva-voce	20%	
COMPONENT 5 Study tour report	20%	Industrial visit/ Scientific Institution visit


KANNUR UNIVERSITY

(Abstract)

Bachelor of Business Administration(Travel & Tourism Management) (BBA/BBA-TTM) Programme -
Scheme, Syllabi and Model Question Papers - Core/Complementary/Open Courses under Choice Based
Credit Semester System-Implemented with effect from 2014 Admission - Orders issued.

ACADEMIC BRANCH

U.O No. Acad/C1/2881/2014

Dated, Civil Station (PO), 3-05-2014

- Read: 1. U.O.No.Acad/C2/2232/2014 dated 14/03/2014
2. Minutes of the meeting of the Board of Studies in Management Studies (Cd) held on
24-03-2014
3. Minutes of the meeting of the Faculties of Commerce and Management Studies held
on 28-03-2014
4. Letter dated 7-04-2014 from the Chairman, Board of Studies in Management Studies
(Cd)

ORDER

1. The Revised Regulations for Choice based Credit Semester System have been implemented in this University with effect from 2014 admission vide paper read (1) above.

2. As per the paper read (2) above, Board of Studies in Management Studies (Cd) finalized the Scheme, Syllabi and Model Question Papers of BBA/BBA-TTM Programmes under Choice Based Credit Semester System with effect from 2014 admission.

3. As per the paper read (3) above the meeting of Faculty of Commerce and Management Studies approved the Scheme, Syllabi and model question papers for BBA/BBA(TTM) w.e.f.2014 admission.

4. As per the paper read (4) above, the Chairman, Board of Studies in Management Studies (Cd) vide paper read (4) above, has forwarded the Scheme, Syllabi and Model Question Papers for BBA/BBA (TTM) Programmes for implementation with effect from 2014 admission.

5. The Vice Chancellor after considering the matter in detail and in exercise of the powers of Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement Scheme, Syllabus and Model Question Papers (Core/Complementary/Open Courses) for BBA/BBA(TTM) under Choice Based Credit Semester System with effect from 2014 admission subject to report Academic Council.

6. Orders are, therefore, issued accordingly.

7. The Implemented Scheme, Syllabi and Model Question Papers are appended.

Sd/-
DEPUTY REGISTRAR (Academic)
For REGISTRAR

To


The Principals of Colleges offering BBA/BBA(TTM) Courses.

(PTO)

286-
5/5/14

1. The Examination Branch (through PA to CE)
2. PS to VC/PA to /PA to Registrar /
3. Chairman, BOS Management Studies (Cd)
4. PA to CE
5. DR/AR I Academic
6. SF/DF/FC.

Forwarded/ by Order


Section Officer

For more details; log on www.kannur university.ac.in



KANNUR UNIVERSITY

(U.O.No.Acad/C1/2881/2014,dt.3-05-2014)

SCHEME AND SYLLABI OF BACHELOR OF BUSINESS ADMINISTRATION (BBA)

UNDER CBCSS PATTERN

(KUCBCSSUG 2014)

KANNUR UNIVERSITY

SCHEME AND SYLLABI OF BACHELOR OF BUSINESS ADMINISTRATION UNDER KUCBCSSUG 2014

The Regulation of UG Programme (KUCBCSS UG 2014) is available in the university website. Following are the additional information with regard to BBA Programme under Choice Based Credit Semester System to be implemented in the academic session 2014-15.

1. **Title of the programme:** This DEGREE shall be called BACHELOR OF BUSINESS ADMINISTRATION .
2. **Eligibility for admission:** Admission shall be made from the Candidates who have passed the Plus Two or equivalent examination with 45% for non commerce subject (not applicable to SC/ST Students) and pass mark for Commerce subject. A weightage of 25 marks be given for each Commerce subject studied by the Candidate in the qualifying examination subject to a maximum of 75 marks.
3. **Duration of the programme:** The duration of the BBA programme of study is three academic years with six semesters.
4. **Medium of Instruction:** The medium of instruction and examination shall be English.

6.0		The total credits	Number	Credits
1	Common Courses	English	4 courses	14
		Additional Language	2 courses	8
		General	4 courses	16
2	Complementary Courses		5 courses	15
3	Open Courses		1 course	2
4	Core Courses	Courses	19 courses	62
		Industrial visit and report	1 course	1
		Placement Training & Project report	1 course	2
Total			37	120

Table of Common Courses (English and Additional Language) for BBA

Sl. No	Course Code	Type of course	Course Title	Semester	Hours/Week	Credits	Marks
1	1A01ENG	Common I	English I	I	5	4	
2	1A02 ENG	Common II	English II	I	4	3	
3	1A07---	Common III	Additional Language I	I	5	4	
4	2A03ENG	Common IV	English III	II	5	4	
5	2A04ENG	Common V	English IV	II	4	3	
6	2A08---	Common VI	Additional Language II	II	5	4	

Table of Common Courses (General Courses) for BBA Programmes

Sl. No	Course Code	Type of course	Course Title	Semester	Hours/Week	Credits	Marks
1	3A11 COM/BBA	Common XI	IT in Business	III	5	4	E - 30 P - 10 I - 10 T - 50
2	3A12 COM/BBA	Common XII	Numerical Skills	III	4	4	E - 40 I - 10 T - 50
3	4A13COM/BBA	Common XIII	Entrepreneurship Development & Project Management	IV	5	4	E - 40 I - 10 T - 50
4	4A14 COM/BBA	Common XIV	Business Ethics & Corporate Social Responsibility	IV	4	4	E - 40 I - 10 T - 50

E: External P: Practical I : Internal T : Total

Table of Complementary Courses for BBA Programmes

Sl. No	Course Code	Type of course	Course Title	Semester	Hours/Week	Credits	Marks
1	1C01 BBA	Complementary I	Business Statistics	I	5	3	E - 40 I - 10 T - 50
2	1C02 BBA	Complementary II	Business Economics	I	3	3	E - 40 I - 10 T - 50
3	2C03 BBA	Complementary III	Quantitative Techniques for Business Decisions	II	5	3	E - 40 I - 10 T - 50
4	3C04 BBA	Complementary IV	Legal Aspects of Business	III	5	3	E - 40 I - 10 T - 50
5	4C05 BBA	Complementary V	Business Research Methods	IV	4	3	E - 40 I - 10 T - 50

Table of Open Courses for BBA Programmes

Sl. No	Course Code	Type of course	Course Title	Semester	Hours/Week	Credits	Marks
1	5D01 BBA	Open I	Basic Accounting/Financial System and Services/Disaster Management	V	2	2	E - 40 I - 10 T - 50

Table of Core Courses for BBA Programmes

Sl. No	Course Code	Type of course	Course Title	Semester	Hours/Week	Credits	Marks
1	1B01 BBA	Core I	Principles & Practice of Management	I	3	3	E - 40 I - 10 T - 50
2	2B02 BBA	Core II	Business Environment	II	3	3	E - 40 I - 10 T - 50
3	2B03 BBA	Core III	Business Communication	II	3	3	E - 40 I - 10 T - 50
4	3B04 BBA	Core IV	Financial Accounting	III	5	4	E - 40 I - 10 T - 50
5	3B05 BBA	Core V	Operations Management	III	4	3	E - 40 I - 10 T - 50
6	3B06 BBA	Core VI	Managerial Skill Development Course (MSDC)	III	2	1	I - 25 T - 25
7	4B07 BBA	Core VII	Marketing Management	IV	4	3	E - 40 I - 10 T - 50
8	4B08 BBA	Core VIII	Corporate Accounting	IV	5	3	E - 40 I - 10 T - 50
9	4B09 BBA	Core IX	Financial Management	IV	4	3	E - 40 I - 10 T - 50
10	4B10 BBA	Core X	Industrial Visit and Report (Study Tour)	IV		1	I - 25 T - 25
11	5B11 BBA	Core XI	Cost Accounting	V	5	4	E - 40 I - 10 T - 50
12	5B12 BBA	Core XII	Human Resource Management	V	5	4	E - 40 I - 10 T - 50
13	5B13 BBA	Core XIII	Banking Theory, Law & Practice	V	4	3	E - 40 I - 10 T - 50

14	5B14 BBA	Core XIV	Organisational Behaviour	V	5	4	E - 40 I - 10 T - 50
15	5B15 BBA	Core XV	Retail Management	V	4	3	E - 40 I - 10 T - 50
16	6B16 BBA	Core XVI	Strategic Management	VI	5	4	E - 40 I - 10 T - 50
17	6B17 BBA	Core XVII	Capital Market & Investment Management	VI	5	4	E - 40 I - 10 T - 50
18	6B18 BBA	Core XVIII	International Business	VI	4	3	E - 40 I - 10 T - 50
19	6B19 BBA	Core XIX	Event Management	VI	4	3	E - 40 I - 10 T - 50
20	6B20 BBA	Core XX	Management Accounting	VI	5	4	E - 40 I - 10 T - 50
21	6B21 BBA	Core XXI	Placement Training & Project Report	VI	3	2	E - 40 I - 10 T - 50

TotalMarksDistribution

1.	English	200
2.	Additional Languages	100
3.	Common Course	200
4.	Open Course	50
5.	Core Course	1000
6.	Complementary	250
	Total	1800

STRUCTURE OF BBA DEGREE PROGRAMME

Semester I

Sl. No.	Course Code	Type of course	Course Title	Hours/Week	Hours/ Sem	Credits	Exam Duration
1	1A01ENG	Common I	English I	5	90	4	3
2	1A02 ENG	Common II	English II	4	72	3	3
3	1A07---	Common III	Additional Language I	5	90	4	3
4	1B01 BBA	Core I	Principles & Practice of Management	3	54	3	3
5	1C01 BBA	Complementary I	Business Statistics	5	90	3	3
5	1C02 BBA	Complementary II	Business Economics	3	54	3	3
Total				25	450		
Sl. No	Course Code	Type of course	Course Title	Hours/Week	Hours/ Sem	Credits	Exam Duration
1	2A03ENG	Common IV	English III	5	90	4	3
2	2A04ENG	Common V	English IV	4	72	3	3
3	2A08---	Common VI	Additional Language II	5	90	4	3
4	2B02 BBA	Core II	Business Environment	3	54	3	3
5	2B03 BBA	Core III	Business Communication	3	54	3	3
6	2C03 BBA	Complementary III	Quantitative Techniques for Business Decisions	5	90	3	3
Total				25	450	20	

Semester III

Sl. No	Course Code	Type of course	Course Title	Hours/Week	Hours / Sem	Credits	Exam Duration
1	3A11/ COM/ BBA	Common XI	IT in Business	Theory	3	54	3
				Practical	2	36	1
2	3A12/ COM/	Common XII	Numerical Skills	4	72	4	3
3	3B04 BBA	Core IV	Financial Accounting	5	90	4	3
4	3B05 BBA	Core V	Operations Management	4	72	3	3
5	3B06 BBA	Core VI	Managerial skill Development Course (MSDC)	2	36	1	
6	3C04 BBA	Complementary IV	Legal Aspects of Business	5	90	3	3
Total				25	450	19	

Semester IV

Sl. No	Course Code	Type of course	Course Title	Hours/Week	Hours/Sem	Credits	Exam Duration
1	4A13COM/BBA	Common XIII	Entrepreneurship Development & Project Management	4	72	4	3
2	4A14COM/BBA	Common XIV	Business Ethics and CSR	4	72	4	3
3	4B07 BBA	Core VII	Marketing Management	4	72	3	3
4	4B08 BBA	Core VIII	Corporate Accounting	5	90	3	3
5	4B09 BBA	Core IX	Financial Management	4	72	3	3
6	4B10 BBA	Core X	Industrial Visit & Report(Study Tour)			1	
7	4C05 BBA	Complementary V	Business Research Methods	4	72	3	3
Total				25	450	21	

Semester V

Sl. No	Course Code	Type of course	Course Title	Hours/Week	Hours/Sem	Credits	Exam Duration
1	5B11 BBA	Core XI	Cost Accounting	5	90	4	3
2	5B12 BBA	Core XII	Human Resource Management	5	90	4	3
3	5B13 BBA	Core XIII	Banking Theory Law & Practice	4	72	3	3
4	5B14 BBA	Core XIV	Organisational Behaviour	5	90	4	3
5	5B15 BBA	Core XV	Retail Management	4	72	3	3
6	5D01 BBA	Open I		2	36	2	2
Total				25	450	20	

Semester VI

Sl. No	Course Code	Type of course	Course Title	Hours/Week	Hours / Sem	Credits	Exam Duration
1	6B16 BBA	Core XVI	Strategic Management	4	72	4	3
2	6B17 BBA	Core XVII	Capital Market & Investment Management	5	90	4	3
3	6B18 BBA	Core XVIII	International Business	4	72	3	3
4	6B19 BBA	Core XIX	Event Management	4	72	3	3
5	6B20 BBA	Core XX	Management Accounting	5	90	4	3
6	6B21 BBA	Core XXI	Placement Training & Project Report	3	54	2	
Total				25	450	20	

5. **Open Courses:** BBA Students shall take one open courses (2Credits) offered by other departments in the V semester.

6. **Managerial Skill Development Course (MSDC):** The course on Management Development is intended for developing the current/latest business knowledge, understanding of the economic situation of the nation and soft skills/employability skills of the BBA students. This course shall be handled by a teacher having genuine interest and latest knowledge in current business, economic survey and union budget. The course shall be conducted in such a way that the above knowledge areas will be covered using various methodologies such as presentations, group discussions, assignments quiz competitions etc. that will enhance the soft/employability skills. The maximum marks for the course shall be 25. The evaluation of the course will be done internally on the basis of a written examination for 20 marks and presentations, assignment and attendance for 5 marks.

7. **Industrial Visit & Project Report:** Every student shall prepare and submit a Report based on industrial visits during the IV Semester under the guidance of a faculty member one month before the end of the semester. Evaluation shall be done internally. The maximum marks for the course shall be 25.

8. **Placement Training & Project Report**

During the sixth semester the candidate shall do a research project on a business/management topic.

Maximum four students as group can take up a topic and the students in consultation and with the consent of the assigned guide may identify a topic and do research on that topic. To have more academic freedom and flexibility, the project should not be attached to any organization.

The candidates together shall prepare and submit a project report to the Department. The report shall be printed and spiral bound with not less than 50 A4 size pages. The project report should be submitted to the Head of the Department on the last working day of the sixth semester.

Project work shall have the following stages

- Project proposal presentation
- Field work and data analysis
- Report writing
- Draft project report presentation
- Final project report submission

The candidate shall prepare at least two copies of the report: one copy for submission to the Department and one copy for the student which he/she has to bring with him/her at the time of viva voce. More copies may be prepared if the guide or both asks for one copy.

Structure of the report

Title page

Certificate from guide countersigned by HOD

Acknowledgements

Contents

Chapter I: Introduction (Organization profile, Research problem, objectives of the study, Research methodology etc.)

Chapter II: Review of literature

Chapters III: and IV: Data Analysis (2 or 3 chapters)

Chapter V: Summary, Findings and Recommendations.

Appendix (Questionnaire, specimen copies of forms, other exhibits etc.)

Bibliography (books, journal articles etc. used for the project work).

Evaluation of project report

The project report shall have internal and external evaluations:

Maximum 50 marks shall be awarded by internal panel of teachers. Out of the internal 50 marks 30 marks shall be given on the basis of the draft report presentation and 20 marks be given for the participation and contribution of the student in various stages of project.

Maximum 50 marks shall be awarded by external examiners. Out of the external 50 marks,

25 marks shall be given for the project report evaluation and 25 marks shall be given for the performance in viva voce examination.

9. **Requirement for passing the course:** For passing the BBA degree program the student shall be required to achieve a minimum of 120 credits of which 38 credits shall be from common courses, 65 credits from core courses, 15 credits from complementary courses and 2 credits from open courses.



KANNUR UNIVERSITY
(Abstract)

Bachelor of Business Administration (BBA) Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

ACADEMIC BRANCH

No.Acad.C1/12392/2019

Dated, Civil Station P.O.,22 .06. 2019

-
- Read:-
1. U.O.No.Acad.C2/429/2017 dated,10-10-2017
 2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
 3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.
 4. The Minutes of the Meeting of the Board of Studies in Management Studies (UG) held on 07.06.2019
 5. Syllabus of BBA Programme , Submitted by the Chairperson, Board of Studies in Management Studies (UG), dated , 13.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.
2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies ,Workshops, discussions etc.
3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.
4. Subsequently, as per paper read (4) above, the Board of Studies in Management Studies (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core,

Complementary Elective & Generic Elective Course of BBA Programme to be implemented with effect from 2019 Admission.

5. Further, as per paper read (5) above, the Chairperson, Board of Studies in Management Studies (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of BBA Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Papers (Core/Complementary Elective/Generic Elective Course) of BBA Programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Papers of BBA Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

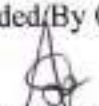
Sd/-
DEPUTY REGISTRAR(ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering BBA Programme

- Copy to:-
1. The Examination Branch (through PA to CE)
 2. The Chairperson, Board of Studies in Management Studies (UG)
 3. PS to VC/PA to PVC/PA to Registrar
 4. DR/AR-I, Academic
 5. The Computer Programmer(for uploading in the website)
 6. SF/DF/FC



Forwarded/By Order


SECTION OFFICER



KANNUR UNIVERSITY

BOARD OF STUDIES, Management Studies (UG)

BACHELOR OF BUSINESS ADMINISTRATION PROGRAMME

(BBA)

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(CBCSS)

Under

Outcome Based Education

(OBE)

(2019 ADMISSION ONWARDS)

Kannur University

Vision and Mission Statement*

Proposed Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady taluk of Wayanad Revenue District.

Proposed Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

Kannur University
Programme Outcomes

PO 1.Critical Thinking:

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.
3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

Preface

The BBA Programme aims at equipping the students with new ideas and changes in the sphere of business and management. It is imperative to update the syllabus to impart the latest developments in business world and changing the view of our students about the global changes.

In the light of UGC guidelines and Higher Education Council's directives, the programme curriculum has been revised to meet the requirements of the modern time. The present revision aims at familiarizing students with latest practices in management in the area of finance, human resource development and marketing. It also aims at acquiring skills in accounting and quantitative techniques in the areas of decision making and management, and building entrepreneurial spirit and competencies, and develops research aptitude.

Dr. BINDU K
Chairperson
Board of Management Studies UG

BACHELOR OF BUSINESS ADMINISTRATION PROGRAMME (BBA)

Programme Specific Outcome
of
Bachelor of Business Administration Programme

PSO 1:

Gain knowledge and skills in the areas of Management principles and practices, finance, human resource management and marketing

PSO 2:

Acquire knowledge in accounting principles and practices and its application in real business settings

PSO 3:

Apply concepts, theories, tools and techniques of statistics, information techniques, economics and numerical skills for decision making

PSO 4:

Build entrepreneurial spirit, develop research attitude and entrepreneurial competencies and managerial abilities

INDEX

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PART B: Discipline specific elective courses-work and credit statement and syllabus	57-80
PART C: Generic elective Courses	81-90
PART D: Model Question Papers	91- onwards

KANNUR UNIVERSITY

BBA PROGRAMME

Credit and courses			
Sl no	Category of course	Number of courses	Credits
1	English Common course(ECC)	2×4 =8 2×3=6	14
2	Additional Common course(ACC)	2×4=8	8
3	General Awareness Course Ability Enhancement Course (AEC) Skill Enhancement Course (SEC)	2×4=8 2×4=8	16
4	Core course(CC) Discipline Specific Elective course (DSEC)		64
5	Complementary elective Course(CEC)	4×4=16	16
6	Generic Elective Course(GEC)	1×2=2	2
Total			120

Semester	Course Title*	Type of Course	Credits	Hours per week	Total Credits	Total Hours
I	English Common Course I	ECC	4	5	22	25
	English Common Course II	ECC	3	4		
	Additional Common Course I	ACC	4	5		
	Core Course I. Principles and Practices of Management	CC	3	3		
	Complementary Elective Course 1 Statistics for business decisions	CEC	4	4		
	Complementary Elective Course 2 Managerial Economics	CEC	4	4		
II	English Common Course III	ECC	4	5	21	25
	English Common Course IV	ECC	3	4		
	Additional Common Course II	ACC	4	5		
	Core Course 2 Business Environment	CC	2	3		
	Core Course 3 Entrepreneurship Development	CC	4	4		
	Complementary Elective Course 3 Quantitative Technique for Business Decisions	CEC	4	4		

III	Skill Enhancement Course I Numerical skills	SEC	4	5	20	25
	Ability Enhancement Course I Personality development and communication skills	AEC	4	4		
	Core Course 4 Financial Accounting	CC	4	6		
	Core Course 5 Marketing Management	CC	4	5		
	Complementary Elective Course 4 Legal Aspects Business	CEC	4	5		
IV	Core Course 6 Human Resource Management	CC	4	6	21	25
	Core Course 7 Financial Management	CC	4	5		
	Core Course 8 Operations management	CC	4	5		
	Core Course 9 Industrial Visit and Report	DSEC	1	0		
	Skill Enhancement Course II IT Tools for business	SEC	4	5		
	Ability Enhancement Course II Environmental studies	AEC	4	4		
V	Core Course 10 Business Research Methods	CC	4	5	18	25
	Core Course 11 Accounting for management	CC	4	6		
	Core Course 12 Elective I	DSE	4	6		
	Core course 13 Elective II	DSE	4	6		
	Generic Elective Course	GEC	2	2		
VI	Core Course 14 Organisation Behaviour	CC	4	6	18	25
	Core Course 15 Banking Theory and Practice	CC	4	5		
	Core Course 16 Project Report and viva voce	CC	2	2		
	Core Course 17 Elective III	DSE	4	6		
	Core Course 18 Elective IV	DSE	4	6		
Total					120	150

PART A:
BBA CORE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
1B01BBA	Core Course I. Principles And Practice Of Management	I	3	3	3
2B02BBA	Core Course 2 Business Environment	II	3	2	3
2B03BBA	Core Course 3 Entrepreneurship Development	II	4	4	3
3B04BBA	Core Course 4 Financial Accounting	III	6	4	3
3B05BBA	Core Course 5 Marketing Management	III	5	4	3
4B06BBA	Core Course 6 Human Resource Management	IV	6	4	3
4B07BBA	Core Course 7 Financial Management	IV	5	4	3
4B08BBA	Core Course 8 Operations Management	IV	5	4	3
4B09BBA	Core Course 9 Industrial Visit And Report	IV	0	1	-
5B10BBA	Core Course 10 Business Research Methods	V	5	4	3
5B11BBA	Core Course 11 Accounting For Management	V	6	4	3
5B12BBA	Core 12 Elective I	V	6	4	3
5B13BBA	Core 13 Elective II	V	6	4	3
6B14 BBA	Core Course 14 Organisation Behaviour	VI	6	4	3
6B15BBA	Core Course 15 Banking Theory and Practice	VI	5	4	3
6B16BBA	Core Course 16 Project Report and Viva Voce Examination	VI	2	2	-
6B17BBA	Core Course 17 Elective III	VI	6	4	3
6B18BBA	Core Course 18 Elective IV	VI	6	4	3

DISCIPLINE SPECIFIC ELECTIVE COURSES**I FINANCE**

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B12BBA	Advanced Financial Management	V	6	4	3
5B13BBA	Income tax law and Practice	V	6	4	3
6B17BBA	Insurance and Risk management	VI	6	4	3
6B18BBA	Stock And Commodity Markets	VI	6	4	3

II HUMAN RESOURCE MANAGEMENT

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B12BBA	Human Resource Development	V	6	4	3
5B13BBA	Performance and Compensation Management	V	6	4	3
6B17BBA	Counselling and negotiation skills for managers	VI	6	4	3
6B18BBA	Organisational Change and Development	VI	6	4	3

III MARKETING

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B12BBA	Consumer Behaviour	V	6	4	3
5B13BBA	Advertising and Brand Management	V	6	4	3
6B17BBA	Logistics Management	VI	6	4	3
6B18BBA	Retail Management	VI	6	4	3

PART B
GENERAL AWARENESS COURSE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
3A11BBA	Skill Enhancement Course I Numerical Skills	III	5	4	3
3A12BBA	Ability Enhancement Course I Personality Development and Communication Skills	III	4	4	3
4A13BBA	Skill Enhancement Course II IT Tools For Business	IV	Theory 3 Practical 2	4	2
4A14BBA	Ability Enhancement Course II Environmental Studies	IV	4	4	3

PART C
COMPLEMENTARY ELECTIVE COURSE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
1C01BBA	Statistics for business decisions	I	4	4	3
1C02BBA	Managerial Economics	I	4	4	3
2C03BBA	Quantitative Techniques For Business Decisions	II	4	4	3
3C04BBA	Legal Aspects Of Business	III	5	4	3

GENERIC ELECTIVE COURSE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5D01BBA	Customer Relationship Management	V	2	2	2
5D02BBA	Service Marketing	V	2	2	2
5D03BBA	E- Commerce	V	2	2	2
5D04BBA	Event Management	V	2	2	2
5D05BBA	Disaster Management	V	2	2	2

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4 (40 MARKS)
INTERNAL	1(10 MARKS)

*20 marks for theory and 20 marks for practical for courses having practical (IT in business)

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT1 INTERNAL TEST	2	TWO TESTS (6 MARKS)
COMPONENT 2 ASSINGMENT/SEMINAR/VIVA	1	INDIVIDUAL OR GROUP (4 MARKS)

EVALUATION FOR GENERIC ELECTIVE

ASSESSMENT	WEIGHTAGE
EXTERNAL	4 (20 MARKS)
INTERNAL	1(5 MARKS)

KANNUR UNIVERSITY
(Abstract)

BCA- Revised Scheme & Syllabus of Core and Open Courses under Choice Based Credit Semester System for Under Graduate Programme - implemented with effect from 2014 admission - Orders Issued.

ACADEMIC BRANCH

No. Acad/C2/7857/2014 (II)

Dated, Civil Station P.O, 04 - 07-2014

Read: 1.U.O No. Acad/C2/2232/2014 dated 14-03-2014

2. Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 27-01-2014
3. Minutes of the meeting of the Faculty of Technology held 01-04-2014
4. Letter dated 24.06.2014 from the Chairman, BOS in Computer Science (UG)

ORDER

1. The Revised Regulations for UG Programme under Choice based Credit & Semester System were implemented in this University with effect from 2014 admission as per paper read (1) above.
2. As per paper read (2) above the Board of Studies in Computer Science(UG) finalized the Scheme, Syllabus & model Question Papers for Core & open courses of BCA programme to be implemented with effect from 2014 admission..
3. As per read (3) above the Faculty of Technology (UG) held on 01.04.2014 approved Scheme, syllabus & model question papers for core & open courses of BCA programme to be implemented with effect from 2014 admission.
4. The Chairman, Board of Studies in Computer Science (UG) vide paper read (4) above has submitted the finalized copy of Scheme, syllabus & Model question papers for core and open courses of BCA programme for implementation with effect from 2014 admission.
5. The Vice Chancellor, after examining the matter in detail, and in exercise of the powers of the Academic Council as per section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised scheme, syllabus& model question papers of BCA Programme with effect from 2014 admission.
6. Orders, are therefore issued implementing the revised scheme, syllabus & model question papers for core & open courses of BCA programme under CBCSS with effect from 2014 admission subject to report to Academic Council
7. Implemented revised Syllabus is appended.

Sd/-
REGISTRAR

To

1. The Principals of Affiliated Colleges offering BCA Programme
2. The Examination Branch (through PA to CE)

Copy To:

1. The Chairman, BOS Computer Science (UG)
2. PS to VC/PA to PVC/PA to Registrar
3. DR/AR I Academic
4. Central Library
5. SF/DF/FC.

Forwarded/By Order



Section Officer



❖ For more details log on to www.kannur_university.ac.in

Handwritten initials

KANNUR UNIVERSITY



COURSE STRUCTURE AND SYLLABUS

for

UNDERGRADUATE PROGRAMME

In

COMPUTER APPLICATION

CORE & OPEN COURSES

Under

CHOICE BASED CREDIT AND SEMESTER SYSTEM

w. e. f. 2014 ADMISSION

General Guidelines, Curricula, Syllabus and Scheme of examinations for BCA Programme w.e.f 2014 admission onwards

BCA, an undergraduate programme under the Faculty of Technology of Kannur University, consists of Computer Application as core subject with one complementary subject (Mathematics). The duration of the programme is six semesters distributed over a period of three years. A semester consists of 90 working days including examination days distributed over a minimum of 18 weeks of five working days each.

COURSES

The number of courses required to complete the programme shall be 40. 'Course' means a segment of subject matter to be covered in a semester (traditionally referred to as paper). The courses include Common Courses including General Course, Complementary Course, Core Course and Open Course. The break-up of the courses is as follows:

Course Type	Total Numbers
Common courses (English + Additional language)	06
Common courses (General)	04
Complementary	04
Core	25
Open Course	01
Total	40

BCA - Course Structure

Semester –I

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Common course English I	5		4	50
2	Common course English II	4		3	50
3	Common course Additional Language I	5		4	50
4	Complementary I - Mathematics I	4		3	50
5	Common course - Informatics for Computer Application	3		4	50
6	Core course 1 - Programming in C	2	2	2	50
	Total	23	2	20	300

Semester –II

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Common course English III	5		4	50
2	Common course English IV	4		3	50
3	Common course Additional Language II	5		4	50
4	Complementary II - Mathematics II	4		3	50
5	Core course 2 -Digital Systems	3		2	50
6	Core course 3–Object Oriented Programming Using C++	2		3	50
7	Core course 4 -Lab – I (Programming in C)			2	25
8	Core course 5 -Lab –II (Programming in C++)		2	2	25
	Total	23	2	23	350

Semester –III

No.	Title of the Course	Hours/Week		Credit	Marks
		Theor y	Practical		
1	Common course – Data Structure	4	3	4	50
2	Common course – Data Base Management System	4	2	4	50
3	Complementary III - Mathematics III	4		3	50
4	Core course 6 -Computer Organization	4		3	50
5	Core course 7 -Introduction to Microprocessors	4		3	50
	Total	20	5	17	250

Semester –IV

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Common course - Numerical Analysis	4		4	50
2	Complementary IV - Mathematics IV	4		3	50
3	Core course 8 - Operating system	4		3	50
4	Core course 9 -Java Programming	4		3	50
5	Core course 10 -Linux Administration	4		3	50
6	Core course 11- Lab –III Data Structure & DBMS			3	25
7	Core course 12 Lab – IV Java Programming, Shell Programming and Linux Administration		5	3	25
	Total	20	5	22	300

Semester –V

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Core course 13 - Software Engineering	4		3	50
2	Core course 14 - Data Communication & Networks	4		3	50
3	Core course 15 - Enterprise Java Programming	4	4	3	50
4	Core course 16 - C# and .Net Programming	3	4	2	50
5	Open course	2		2	25
	Total	17	8	13	225

Semester –VI

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Core course 17 - Web Technology	2		2	50
2	Core course 18 - Data Mining & Data Warehousing	4		3	50
3	Core course 19 - Elective I	4		3	50
4	Core course 20 - Elective II	4		3	50
5	Core course 21 - System Software	3		2	50
6	Core course 22 - Lab – V Enterprise Java Programming			3	25
7	Core course 23 - Lab – VI .Net Programming			3	25
8	Core course 24 - Lab – VII Web Technology		3	2	25
9	Core course 25 - Lab – VIII Project		5	4	50
	Total	17	8	25	375

Common course:

Means a course that comes under the category of courses, including compulsory English and additional language courses and a set of general courses. There are 10 common courses for the BCA programme. This includes four English courses (two courses each in first and second semesters), two additional language courses (one course each in first and second semesters) and four General courses (one in first semester, two in third semester and one in fourth semester). The syllabi of general courses include the topics related to Computer Application.

Complementary Course:

Means a course which is generally related to the core course (traditionally referred to as subsidiary paper). There is one Complementary subject for BCA programme. The total number of Complementary courses offered for BCA shall be FOUR. Complementary courses are offered during first to fourth semesters.

Core course:

Means a compulsory course in a subject related to a particular degree programme. The core subject Computer Application consists of 17 theory papers, 7 practical papers and 1 project work. The semester wise list of Core and General Courses is given in the following tables.

Open course:

Means a course which can be opted by a student at his/her choice. There shall be one open course in core subjects in the fifth semester. The open course shall be open to all the students in the institution except the students in the parent department. For the purpose of open course B.Sc Computer Science and BCA should be considered as a single department. The students can opt for that course from any other department in the institution. Each department can decide the open course from a pool of three courses offered by the university. A department can offer only one open course in one semester.

Scheme Core, General and Open - Courses (BCA)

S.No	Sem	Course Code	Course Name	Hours/Week		Credits
				Theory	Practical	
1	I	1A11BCA	Informatics for Computer Application	3		4
2	I	1B01BCA	Programming in C	2	2	2
3	II	2B02BCA	Digital Systems	3		2
4	II	2B03BCA	Object Oriented Programming Using C++	2		3
5	II	2B04BCA	Lab – I Programming in C			2
6	II	2B05BCA	Lab – II Programming in C++		2	2
7	III	3A12BCA	Data Structure	4	3	4
8	III	3A13BCA	Database Management System	4	2	4
9	III	3B06BCA	Computer Organization	4		3
10	III	3B07BCA	Introduction to Microprocessors	4		3
11	IV	4A14BCA	Numerical Analysis	4		4
12	IV	4B08BCA	Operating System	4		3
13	IV	4B09BCA	Java Programming	4		3
14	IV	4B10BCA	Linux Administration	4		3
15	IV	4B11BCA	Lab–III Data Structures and DBMS			3
16	IV	4B12BCA	Lab–IV Java Programming, Shell Programming and Linux Administration		5	3

17	V	5B13BCA	Software Engineering	4		3
18	V	5B14BCA	Data Communication & Networks	4		3
19	V	5B15BCA	Enterprise Java Programming	4	4	3
20	V	5B16BCA	C# and .Net Programming	3	4	2
21	V	5D - -BCA	Open Course	2		2
22	VI	6B17BCA	Web Technology	2		2
23	VI	6B18BCA	Data Mining & Data Warehousing	4		3
24	VI	6B19BCA	Elective I	4		3
25	VI	6B20BCA	Elective II	4		3
26	VI	6B21BCA	System Software	3		2
27	VI	6B22BCA	Lab – V Enterprise Java Programming			3
28	VI	6B23BCA	Lab – VI .Net Programming			3
29	VI	6B24BCA	Lab – VII Web Technology		3	2
30	VI	6B25BCA	Lab – VIII Project		5	4

Scheme of Open course for 5th semester

Sl. No.	Sem	Course Code	Name of the Course	Hours / Week	Credit
1	V	5D01BCA	Programming with C	2	2
2	V	5D02BCA	Web Technology	2	2
3	V	5D03BCA	Database Management System	2	2

Electives:

Course 6B19BCA shall be selected from Section A and Course 6B20BCA shall be selected from Section B

No	Sem	Course Code	Course Name	Hours/Week	Credits
SECTION A					
1	VI	6B19BCA - E01	Information Security	4	3
2	VI	6B19BCA - E02	Information Storage System	4	3
3	VI	6B19BCA - E03	Mobile Communications	4	3
SECTION B					
4	VI	6B20BCA - E04	Algorithm Analysis and Design	4	3
5	VI	6B20BCA - E05	Network Programming	4	3
6	VI	6B20BCA - E06	Digital Image Processing	4	3

CREDITS

Each course shall have certain credits. For passing the BCA programme the student shall be required to achieve a minimum of 120 credits of which 38 credits (14 credits for English courses, 8 credits for Additional language courses and 16 credits for General courses) shall be from common courses. Minimum credits required for core, complementary and open courses put together are 82.

CREDIT DISTRIBUTION (LRP- BCA)

SUBJECT	SEMESTER	COMMON		GENERAL	CORE	COMPLEMENTARY	OPEN	TOTAL
		ENGLISH	ADDITIONAL		Computer Application	Maths		
COMPUTER APPLICATION	I	4+3	4	4	2	3	----	20
	II	4+3	4	----	2+3+2+2	3	----	23
	III	----	----	4+4	3+3	3	----	17
	IV	----	----	4	3+3+3+3+3	3	----	22
	V	----	----	----	3+3+3+2	----	2	13
	VI	----	----	----	2+3+3+3+2+3+3 +2+4	----	----	25
	TOTAL	14	8	16	68	12	2	120

ATTENDANCE

Minimum 75% attendance is compulsory for theory as well as practical courses, failing which a student is not eligible to appear for university examinations.

SEMINARS / ASSIGNMENTS

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

PROJECT WORK

Every student of BCA Programme shall have to work on a project of four credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation (Project) at the end of sixth semester. Individual projects are recommended but in an instance where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to **FOUR**.

RECORDS

A record is compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works.

COURSE EVALUATION

The evaluation scheme for each course shall contain two parts

1. Internal Assessment (IA)
2. External Evaluation (End Semester Evaluation ESE)

20% weight shall be given to the internal evaluation. The remaining 80% weight shall be for the external evaluation. The distribution of marks for each course is given in following table:

Scheme of mark distribution of BCA programme

Courses		No of Courses	Marks Per Course			Total Marks
			Int	Ext	Total (Int + Ext)	
Common	English	4	10	40	50	200
	Addl. Language	2	10	40	50	100
	General	4	10	40	50	200
Complementary	Mathematics	4	10	40	50	200
Core	Theory	17	10	40	50	850
	Practical	7	5	20	25	175
	Project	1	10	40	50	50
Total						1800

Internal Assessment:

20% of the total marks in each course are for internal assessment. The marks secured for internal assessment only need be sent to university by the colleges concerned. The internal assessment shall be based on a predetermined transparent system involving written test, assignments/ seminars/ Viva and attendance in respect of theory courses and submissions and records, tests and attendance in respect of practical courses. Components with percentage of marks of Internal Evaluation of Theory Courses are-

Attendance	- 25%
Assignment/ Seminar/Viva	- 25%
Test paper	- 50%

For practical courses-

Attendance	- 25%
Submissions and Record	- 25%
Practical Test Paper	- 50%

(If a fraction appears in total internal marks, nearest whole number is to be taken)

Attendance of each course shall be evaluated as below

Attendance %	% Marks Allotted
Above 90%	100%
85 to 89%	80%
80 to 84 %	60%
75 to 79 %	40%
Less than 75%	Not eligible for University exam

Theory External Evaluation:

External evaluation carries 80% of marks. All question papers shall be set by the university. The external examination in theory courses is to be conducted with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined Scheme of valuation and answer keys provided by the University. Details regarding the End Semester Evaluation of core and open courses are

given below:

1. Core Courses

- Maximum Marks for each course - **40 Marks**
- Duration of examination - **3 Hrs.**

Sl.No	Type of Question	Marks	Number of Questions to be answered / total number of questions	Max. Marks
1	A bunch of 8 one word answer questions	0.5	08/08	4
2	Short answer	2	07/10	14
3	Short Essay /Programs	3	04/6	12
4	Essay Type	5	02/4	10

2. Open Course

- Maximum Marks for open course - **20 Marks**
- Duration of examination - **2 Hrs.**

Sl.No	Type of Question	Marks	Number of Questions to be answered / total number of questions	Max. Marks
1	A bunch of 8 one word answer questions	0.5	08/08	4
2	Short answer	2	03/05	6
3	Short Essay /Programs	3	02/04	6
4	Essay Type	4	01/02	4

External Evaluation Practical

External evaluation carries 80% of marks. All question papers shall be set by the

university. The external examination in practical courses shall be conducted by **TWO** external examiners appointed by the University. No practical examination will be conducted in odd semester. Practical examinations shall be conducted in the even semester (II, IV and VI). The Scheme of Examinations and Model Question Papers of all the theory and practical courses offered under core, general and open courses are include in the detailed syllabus. Practical examination assessment of different components may be taken as below.

Components	Part A	Part B
Program writing	3	3
Compilation/Execution (without errors)	2	2
Correct Output	2	2
Modification	1	1
Viva-voice	2	2
Total	10	10

Project Evaluation

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

Internal (20% of the total)			External (80% of Total)		
Components	% of Marks	Marks	Components	% of Marks	Marks
Punctuality	20	02	Written Synopsis/Abstract	12.5	5
Relevance of topic System study / Design of tables	20	02	Content of the Project	12.5	5
			Quality of project work/Use of software/ tools	12.5	5
			Perfection of the work (Designs of tables/ Input & Output forms)	25	10
			Live demo	12.5	5
Project Report	30	03	Viva-Voce	25	10
Presentation & Viva-voce	30	03			
Total	100	10	Total	100	40

External Examiners will be appointed by the University in consultation with the Chairperson of the Board. Project evaluation shall be done along with the external examination of Core Practical lab IV & V in sixth semester.

Pass Conditions:

Submission of the project report and presentation of the student for viva are compulsory for the evaluation. No marks shall be awarded to a candidate if she/he fails to submit the project report for external evaluation. The student should get a minimum of 40 % marks for pass in the project. There shall be no improvement chance for the Marks obtained in the Project Report. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re-done and the report may be re-submitted along with subsequent exams through parent department.



KANNUR UNIVERSITY
(Abstract)

Bachelor of Computer Application (BCA) Programme- Scheme, Syllabus and Pattern of Question Papers of Core and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/12371/2019/i

Civil Station P.O, Dated 21/06/2019

- Read:-
1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
 2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
 3. U.O No.Acad.C2/429/2017 Vol.II dated 03-06-2019
 4. The Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 07-06-2019
 5. Syllabus of Bachelor of Computer Application (BCA) submitted by the Chairperson, Board of Studies in Computer Science (UG) dated 13/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.
2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies , Workshops, discussions etc.
3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.
4. Subsequently, as per paper read (4) above, the Board of Studies in Computer Science (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core & Generic Elective of Bachelor of Computer Application (BCA) Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Computer Science (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of Bachelor of Computer Application (BCA) Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core /Generic Elective Course) of Bachelor of Computer Application (BCA)programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to report before the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of Bachelor of Computer Application (BCA) Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering BCA
(Bachelor of Computer Application programme)

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Computer Science (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer (for uploading in the website)
6. SF/DF/FC

Forwarded/By Order



SECTION OFFICER



KANNUR UNIVERSITY

BOARD OF STUDIES-COMPUTER SCIENCE (UG)

***SYLLABUS FOR
BACHELOR OF COMPUTER APPLICATIONS(B C A)
CORE AND GENERIC ELECTIVE COURSES***

**CHOICE BASED CREDIT AND SEMESTER SYSTEM
(OBE-Outcome Based Education System)**

(2019 ADMISSION ONWARDS)

Kannur University
Vision and Mission Statement

Vision:To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manantavadytaluk of Wayanad Revenue District”

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region’s intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

Programme Outcomes (PO)

PO 1.Critical Thinking:

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminationsand empathetic social awareness about various kinds of marginalization.
3. Internalize certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernization of the post-colonial society.

PO 3.Effective Communication:

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

The Board of Studies in Computer Science bears deep academic venture and curriculum vision in forming the syllabus for undergraduate programme of Kannur University. The curriculum and syllabus pinpoint the creation of technical caliber of students through class room learning, workshops, seminars, presentations and summative and formative assessments.

As the present era moves with advancements in Science and Technology, the Board of Studies in computer Science of Kannur University predominantly emphasize employment-based curriculum formation to make the students extremely competent in global scenario.

Recent algorithms, Networks, Operating Systems etc. are the crux of vast developing technical dimensions of the computer science and Engineering. This curriculum and syllabus clearly states the graduate attributes/Outcomes and is developed after numerous workshops and discussions with different stakeholders. The Board of Studies in Computer Science has resolved to introduce the syllabus in the affiliated colleges for UG programme from 2019 admission onwards. I place records of gratitude to the members of board of studies, Faculties and stake holders to help me in the formation of syllabus.

Lt. Thomas Scaria

Chairperson

Board of Studies, Computer Science (UG)
Kannur University

KANNUR UNIVERSITY

Programme Specific Outcome of B.Sc. Computer Science Programme

PSO1	Understand the concepts of Computer Science and Applications.
PSO2	Understand the concepts of System Software and Application Software.
PSO3	Understand the concepts of Algorithms and Programming.
PSO4	Understand the concepts of Computer Networks.
PSO5	Design, develop, implement and test software systems to meet the given specifications, following the principles of Software Engineering.

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KANNUR UNIVERSITY

BCA PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	Common Course – English I	4	5	19	25
	Common Course – English II	3	4		
	Common Course – Additional Language I	4	5		
	General Awareness Course I – 1A11BCA Informatics for Computer Applications	2	3		
	Core Course I – 1B01BCA Programming In C	2	2		
	Core Course IV – 2B04BCA Lab I: Programming In C*	0	2		
	Complementary Elective (Mathematics I)	4	4		
II	Common Course – English III	4	5	22	25
	Common Course – English IV	3	4		
	Common Course – Additional Language II	4	5		
	Core Course II – 2B02BCA Digital Systems	3	3		
	Core Course III – 2B03BCA Object Oriented Programming Using C++	2	2		
	Core Course IV – 2B04BCA Lab I: Programming In C*	1	0		
	Core Course V – 2B05BCA Lab II: Programming In C++*	1	2		
	Complementary Elective (Mathematics II)	4	4		
III	General Awareness Course II – 3A12BCA Data Structures	4	4	18	25
	General Awareness Course III – 3A13BCA Database Management System	4	4		
	Core Course VI – 3B06BCA Introduction to Microprocessors	3	4		
	Core Course VII – 3B07BCA Java Programming	3	4		
	General Awareness Course V – 4A15BCA Lab III: Data Structure and DBMS**	0	3		
	Core Course XI – 4B11BCA Lab IV: Java Programming, Shell Programming & Linux Administration**	0	2		
	Complementary Elective (Mathematics III)	4	4		

IV	General Awareness Course IV – 4A14BCA Discrete Mathematical Structures	4	4	21	25
	Core Course VIII – 4B08BCA Operating Systems	3	4		
	Core Course IX – 4B09BCA Computer Organization	3	4		
	Core Course X – 4B10BCA Linux Administration	3	4		
	General Awareness Course V – 4A15BCA Lab III: Data Structure and DBMS**	2	2		
	Core Course XI – 4B11BCA Lab IV: Java Programming, Shell Programming & Linux Administration **	2	3		
	Complementary Elective (Mathematics IV)	4	4		
V	Core Course XII – 5B12BCA Software Engineering	3	3	16	25
	Core Course XIII – 5B13BCA Enterprise Java Programming	4	4		
	Core Course XIV – 5B14BCA- Python Programming	2	2		
	Core Course XV – 5B15BCA Web Technology	2	2		
	Core Course XVI – 5B16BCA Discipline Specific Elective I	3	4		
	Core Course XXI– 6B21BCA Lab V: Enterprise Java Programming***	0	3		
	Core Course XXII– 6B22BCA Lab VI: Python Programming***	0	3		
	Core Course XXIII– 6B23BCA Lab VII: Web Technology***	0	2		
	General Elective Course	2	2		
VI	Core Course XVII – 6B17BCA Design and Analysis of Algorithm	4	4	24	25
	Core Course XVIII – 6B18BCA Introduction to Compiler	3	4		
	Core Course XIX – 6B19BCA Data Communication & Networks	3	3		
	Core Course XX – 6B20BCA Discipline Specific Elective II	3	3		
	Core Course XXI– 6B21BCA Lab V: Enterprise Java Programming***	2	2		
	Core Course XXII– 6B22BCA Lab VI: Python Programming***	3	2		
	Core Course XXIII– 6B23BCA Lab VII: Web Technology***	2	2		
	Core Course XXIV – 6B24BCA Project	4	5		
Total				120	150

*External examination will be conducted at the end of second semester

**External examination will be conducted at the end of fourth semester

***External examination will be conducted at the end of sixth semester

Complementary Elective: Mathematics

Total Marks of the Programme- 1850 Marks (Eng 200 Marks, Additional
Common Course 100 Marks, Core 1350, Complementary Elective 200 Marks)

PART A
BCACORE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS (INTERNAL + EXTERNAL)
1A11BCA	INFORMATICS FOR COMPUTER APPLICATIONS	1	3	2	3	10+40
1B01BCA	PROGRAMMING IN C	1	2	2	3	10+40
2B02BCA	DIGITAL SYSTEMS	2	3	3	3	10+40
2B03BCA	OBJECT ORIENTED PROGRAMMING USING C++	2	2	2	3	10+40
2B04BCA	LAB I: PROGRAMMING IN C	2	I SEM 2 II SEM 0	1	3	5+20
2B05BCA	LAB II: PROGRAMMING IN C++	2	2	1	3	5+20
3A12BCA	DATA STRUCTURES	3	4	4	3	10+40
3A13BCA	DATABASE MANAGEMENT SYSTEM	3	4	4	3	10+40
3B06BCA	INTRODUCTION TO MICROPROCESSORS	3	4	3	3	10+40
3B07BCA	JAVA PROGRAMMING	3	4	3	3	10+40
4A14BCA	DISCRETE MATHEMATICAL STRUCTURES	4	4	4	3	10+40
4B08BCA	OPERATING SYSTEMS	4	4	3	3	10+40
4B09BCA	COMPUTER ORGANIZATION	4	4	3	3	10+40
4B10BCA	LINUX ADMINISTRATION	4	4	3	3	10+40
4A15BCA	LAB III: DATA STRUCTURES AND DBMS	4	III SEM 3 IV SEM 2	2	3	5+20
4B11BCA	LAB IV: JAVA PROGRAMMING, SHELL PROGRAMMING & LINUX ADMINISTRATION	4	III SEM 2 IV SEM 3	2	3	5+20
5B12BCA	SOFTWARE ENGINEERING	5	3	3	3	10+40
5B13BCA	ENTERPRISE JAVA PROGRAMMING	5	4	4	3	10+40
5B14BCA	PYTHON PROGRAMMING	5	2	2	3	10+40
5B15BCA	WEB TECHNOLOGY	5	2	2	3	10+40
5B16BCA	DISCIPLINE SPECIFIC ELECTIVE I	5	4	3	3	10+40
5D--BCA	GENERIC ELECTIVE COURSE	5	2	2	2	5+20

6B17BCA	DESIGN AND ANALYSIS OF ALGORITHM	6	4	4	3	10+40
6B18BCA	INTRODUCTION TO COMPILER	6	4	3	3	10+40
6B19BCA	DATA COMMUNICATION & NETWORKS	6	3	3	3	10+40
6B20BCA	DISCIPLINE SPECIFIC ELECTIVE II	6	3	3	3	10+40
6B21BCA	LAB V: ENTERPRISE JAVA PROGRAMMING	6	V SEM 3 VI SEM 2	2	3	5+20
6B22BCA	LAB VI: PYTHON PROGRAMMING	6	V SEM 3 VI SEM 2	3	3	5+20
6B23BCA	LAB VII: WEB TECHNOLOGY	6	V SEM 2 VI SEM 2	2	3	5+20
6B24BCA	PROJECT	6	5	4	-	20+80
*AN INDUSTRIAL VISIT (STUDY TOUR) IS RECOMMENDED FOR THE PROJECT WORK						

LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B16BCA-E01	INFORMATION SECURITY	5	4	3	3
5B16BCA-E02	MOBILE COMMUNICATIONS	5	4	3	3
5B16BCA-E03	C# AND .NET PROGRAMMING	5	4	3	3
5B16BCA-E04	BIO-INFORMATICS	5	4	3	3
6B20BCA-E01	DATA MINING AND DATA WAREHOUSING	6	3	3	3
6B20BCA-E02	NETWORK PROGRAMMING	6	3	3	3
6B20BCA-E03	DIGITAL IMAGE PROCESSING	6	3	3	3
6B20BCA-E04	CLOUD COMPUTING	6	3	3	3

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

CONTINUOUS INTERNAL ASSESSMENT FOR THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT1: TEST	80%	MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE MARKS OBTAINED IN THE TESTS CONDUCTED.
COMPONENT 2: ASSIGNMENT/ SEMINAR/VIVA	20%	ANY ONE COMPONENT

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	Short Answer	6 Questions x 1 Mark = 6 Marks
	Answer all questions	6 Questions x 1 Mark = 6 Marks
Part B	Short Essay	8 Questions x 2 Marks = 16 Marks
	Answer any 6 questions	6 Questions x 2 Marks = 12 Marks
Part C	Essay	6 Questions x 3 Marks = 18 Marks
	Answer any 4 questions	4 Questions x 3 Marks = 12 Marks
Part D	Long Essay	4 Questions x 5 Marks = 20 Marks
	Answer any 2 questions	2 Questions x 5 Marks = 10 Marks
Total Marks Including Choice: 60		
Maximum Marks for the Course: 40		

CONTINUOUS EVALUATION FOR PRACTICAL

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT 1: LAB SKILLS, OBSERVATION NOTE AND PUNCTUALITY	20% FOR LAB SKILL 20% FOR OBSERVATION NOTE AND PUNCTUALITY	OBSERVATION NOTE IS MANDATORY. MARKS SHOULD BE GIVEN CONSIDERING OBSERVATION NOTE LAB SKILLS AND PUNCTUALITY.
COMPONENT1: TEST	60%	MODEL EXAMINATION SHOULD BE CONDUCTED BEFORE EXTERNAL EXAM AND CONSIDERED FOR INTERNAL MARK

END SEMESTER EVALUATION FOR PRACTICAL

*EXCEPT : 2B04BCA PROGRAMMING IN C- LAB

COMPONENT	PART A	PART B
Code Writing	3	3
Output	3	3
Modification for Part A or Part B	3	
Record	2	
Viva	3	
Total Marks	20	

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	2 Questions x 10 Mark = 20 Marks	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Part B	2 Questions x 10 Mark = 20 Marks	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Total Marks Including Choice: 40		
Maximum Marks for the Course: 20		

SEMINARS/ASSIGNMENTS/VIVA

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

RECORDS

One rough record (Observation Note) and one fair record are compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works. Record mark is calculated at the time of End Semester Evaluation. Observation notes are compulsory in Lab hours. Students should get signature for each program done in the lab from the faculties and those programs are recommended for fair record.

PROJECT WORK

Every student of B.Sc. Computer Science Programme shall have to work on a project of FIVE credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation at the end of sixth semester. Individual projects are recommended but, in an instance, where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to THREE.

PROJECT EVALUATION

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. Assessment of different components may be taken as below.

CONTINUOUS EVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Punctuality	20%
Relevance of topic System study / Design of tables	20%
Project Report	30%
Presentation & Viva-voce	30%
Total	100%

END SEMESTER EVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Written Synopsis/Abstract	12.5%
Content of the Project	12.5%
Quality of project work/Use of software/ tools	12.5%
Perfection of the work (Designs of tables/ Input & Output forms)	25%
Live demo	12.5%
Viva-voce	25%
Total	100%



KANNUR UNIVERSITY
(Abstract)

B.Sc. Computer Science Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

No.Acad.C2/12371/2019

Academic Branch

Civil Station P.O, Dated 21/06/2019

- Read:-
1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
 2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
 3. U.O No.Acad.C2/429/2017 Vol.II dated 03-06-2019
 4. The Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 07-06-2019
 5. Syllabus of B.Sc. Computer Science submitted by the Chairperson, Board of Studies in Computer Science (UG) dated 13/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.
2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies, Workshops, discussions etc.
3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.
4. Subsequently, as per paper read (4) above, the Board of Studies in Computer Science (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc.Computer Science Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Computer Science (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc Computer Science Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) of B.Sc. Computer Science programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to report before the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.Sc.Computer Science Programme are uploaded in the University website (www.kannuruniversity.ac.in)


Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
for REGISTRAR

To
The Principals of Colleges offering B.Sc. Computer Science Programme

- Copy to:-
1. The Examination Branch (through PA to CE)
 2. The Chairperson, Board of Studies in Computer Science (UG)
 3. PS to VC/PA to PVC/PA to Registrar
 4. DR/AR-I, Academic
 5. The Computer Programmer (for uploading in the website)
 6. SF/DF/FC

Forwarded/By Order


SECTION OFFICER







KANNUR UNIVERSITY

BOARD OF STUDIES-COMPUTER SCIENCE(UG)

***SYLLABUS FOR B.SC. COMPUTER SCIENCE CORE,
COMPLEMENTARY ELECTIVE COURSE FOR
B.SC. MATHEMATICS/STATISTICS/PHYSICS/
ELECTRONICS PROGRAMMES AND
GENERIC ELECTIVE COURSES***

**CHOICE BASED CREDIT AND SEMESTER SYSTEM
(OBE-Outcome Based Education System)**

(2019 ADMISSION ONWARDS)

Kannur University
Vision and Mission Statement

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manantavadytaluk of Wayanad Revenue District”

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region’s intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

Programme Outcomes (PO)

PO 1. Critical Thinking:

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2. Effective Citizenship:

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.
3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3. Effective Communication:

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

PO 4. Interdisciplinarity:

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

Technological innovations have redefined the traditional concepts of education, profession and lifestyles in the contemporary scenario. Computer Systems are a part of every aspect of prevalent culture from home video game consoles to hospital monitoring equipment. Computer scientists design, build and improve these systems, finding new applications for sophisticated technology. India has been one of the leading exporters of IT talent and Indian computer professionals have played major role in the growth and development of IT sector in various countries.

The Board of Studies in Computer Science travails to offer students with a solid technological foundation through the reformed curriculum for undergraduate programme of Kannur University. The curriculum aims at developing technical caliber among students through academic explorations in the classroom, extended academic activities like seminars, workshops and conferences. Formative and summative assessments will absolutely be in tune with the learning outcomes and the instructional strategies.

In this era of unprecedented technological developments, the Board of Studies in Computer Science of Kannur University substantially emphasizes employment-based curriculum to empower the students with refined technical competence. This curriculum categorically states the graduate attributes / outcomes and has been developed after various workshops and academic deliberations with different stakeholders at various levels. The Board of Studies in Computer Science has resolved to introduce the syllabus for UG Programme in the affiliated colleges from 2019 admission onwards and I would like to place on record my gratefulness to the members of the Board of Studies, faculty and stakeholders for having helped me in the formulation of this syllabus.

Lt. Thomas Scaria

Chairperson

Board of Studies, Computer Science (UG)
Kannur University

KANNUR UNIVERSITY

Programme Specific Outcome of B.Sc. Computer Science Programme

PSO1	Understand the concepts of Computer Science and Applications.
PSO2	Understand the concepts of System Software and Application Software.
PSO3	Understand the concepts of Algorithms and Programming.
PSO4	Understand the concepts of Computer Networks and Operating Systems
PSO5	Design, develop, implement and test software systems to meet the given specifications, following the principles of Software Engineering.

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KANNUR UNIVERSITY

BSC COMPUTER SCIENCE PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	Common Course – English I	4	5	18	25
	Common Course – English II	3	4		
	Common Course – Additional Language I	4	5		
	Core Course I – 1B01CSC Introduction to C Programming	2	1		
	Core Course III – 2B03CSC Lab 1: C Programming*	0	2		
	Complementary Elective I (Mathematics /Statistics)	3	4		
	Complementary Elective II (Physics)	2	2		
	Complementary Elective II (Physics- Practical)	-	2		
II	Common Course – English III	4	5	20	25
	Common Course – English IV	3	4		
	Common Course – Additional Language II	4	5		
	Core Course II – 2B02CSC Advanced C Programming	2	1		
	Core Course III – 2B03CSC Lab 1: C Programming*	2	2		
	Complementary Elective I (Mathematics /Statistics)	3	4		
	Complementary Elective II (Physics)	2	2		
	Complementary Elective II (Physics- Practical)	-	2		
III	General Awareness Course I – 3A11CSC Programming in C++	3	3	15	25
	General Awareness Course II – 3A12CSC Database Management System	3	3		
	Core Course IV – 3B04CSC Data Structures	4	4		
	Core Course VI – 4B06CSC Lab II: Data Structures Using C++**	0	3		
	Core Course VII – 4B07CSC Lab III: Database Management System**	0	2		
	Complementary Elective I (Mathematics /Statistics)	3	5		
	Complementary Elective II (Physics)	2	3		
	Complementary Elective II (Physics- Practical)	-	2		

IV	General Awareness Course III – 4A13CSC Digital Electronics	3	3	24	25
	General Awareness Course IV – 4A14CSC Operating Systems	3	3		
	Core Course V – 4B05CSC Software Engineering	4	4		
	Core Course VI – 4B06CSC Lab II: Data Structures Using C++**	3	3		
	Core Course VII – 4B07CSC Lab III: Database Management System**	2	2		
	Complementary Elective I (Mathematics /Statistics)	3	5		
	Complementary Elective II (Physics)	2	3		
	Complementary Elective II (Physics- Practical)	4	2		
V	Core Course VIII – 5B08CSC Web Technology	4	4	17	25
	Core Course IX – 5B09CSC Java Programming	4	4		
	Core Course X – 5B10CSC Computation Using Python	3	3		
	Core Course XI – 5B11CSC- Discipline Specific Elective I	4	4		
	Core Course XVI – 6B16CSC Lab IV: Java Programming***	0	4		
	Core Course XVII – 6B17CSC Lab V: Web Technology and Python Programming***	0	4		
	General Elective Course	2	2		
VI	Core Course XII – 6B12CSC Computer Networks	4	4	26	25
	Core Course XIII – 6B13CSC Compiler Design	4	4		
	Core Course XIV – 6B14CSC Computer Organization	3	3		
	Core Course XV – 6B15CSC- Discipline Specific Elective II	4	4		
	Core Course XVI – 6B16CSC Lab IV: Java Programming***	3	2		
	Core Course XVII – 6B17CSC Lab V: Web Technology and Python Programming***	3	2		
	Core Course XVIII – 6B18CSC Project	5	6		
Total				120	150

Total Marks of the Programme – 1750 Marks (Eng-200 Marks, Additional Common Course 100 Marks, Core 1050 Marks, First Complementary Elective 200 Marks and Second Complementary Elective -200 Marks)

*External examination will be conducted at the end of second semester

**External examination will be conducted at the end of fourth semester

***External examination will be conducted at the end of sixth semester

First Complementary Elective: Mathematics/Statistics

Second Complementary Elective: Physics

PART A

B.SC. COMPUTER SCIENCE CORE COURSES
WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS^(INTERNAL + EXTERNAL)
1B01CSC	INTRODUCTION TO C PROGRAMMING	1	1	2	3	10+40
2B03CSC	LAB I: C PROGRAMMING	1	2	0	-	-
2B02CSC	ADVANCED C PROGRAMMING	2	1	2	3	10+40
2B03CSC	LAB I: C PROGRAMMING	2	2	2	3	5+20
3A11CSC	PROGRAMMING IN C++	3	3	3	3	10+40
3A12CSC	DATABASE MANAGEMENT SYSTEM	3	3	3	3	10+40
3B04CSC	DATA STRUCTURES	3	4	4	3	10+40
4B06CSC	LAB II: DATA STRUCTURES USING C++	3	3	0	-	-
4B07CSC	LAB III: DATABASE MANAGEMENT SYSTEM	3	2	0	-	-
4A13CSC	DIGITAL ELECTRONICS	4	3	3	3	10+40
4A14CSC	OPERATING SYSTEMS	4	3	3	3	10+40
4B05CSC	SOFTWARE ENGINEERING	4	4	4	3	10+40
4B06CSC	LAB II: DATA STRUCTURES USING C++	4	3	3	3	5+20
4B07CSC	LAB III: DATABASE MANAGEMENT SYSTEM	4	2	2	3	5+20
5B08CSC	WEB TECHNOLOGY	5	4	4	3	10+40
5B09CSC	JAVA PROGRAMMING	5	4	4	3	10+40
5B10CSC	COMPUTATION USING PYTHON	5	3	3	3	10+40
5B11CSC	DISCIPLINE SPECIFIC ELECTIVE I	5	4	4	3	10+40
5D--CSC	GENERIC ELECTIVE COURSE	5	2	2	2	5+20
6B16CSC	LAB IV: JAVA PROGRAMMING	5	4	0	-	-
6B17CSC	LAB V: WEB TECHNOLOGY & PYTHON PROGRAMMING	5	4	0	-	-
6B12CSC	DATA COMMUNICATION AND COMPUTER NETWORKING	6	4	4	3	10+40

6B13CSC	COMPILER DESIGN	6	4	4	3	10+40
6B14CSC	COMPUTER ORGANIZATION	6	3	3	3	10+40
6B15CSC	DISCIPLINE SPECIFIC ELECTIVE II	6	4	4	3	10+40
6B16CSC	LAB IV: JAVA PROGRAMMING	6	2	3	3	5+20
6B17CSC	LAB V: WEB TECHNOLOGY & PYTHON PROGRAMMING	6	2	3	3	5+20
6B18CSC	PROJECT*	6	6	5	-	20+80
*AN INDUSTRIAL VISIT (STUDY TOUR) IS RECOMMENDED FOR THE PROJECT WORK						

TOTAL MARKS OF CORE COURSES 1050

LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B11CSC-A	ALGORITHM DESIGNING	5	4	4	3
5B11CSC-B	LINUX ADMINISTRATION	5	4	4	3
5B11CSC-C	COMPUTER GRAPHICS	5	4	4;	3
6B15CSC-A	INFORMATION SECURITY	6	4	4	3
6B15CSC-B	DATA MINING	6	4	4	3
6B15CSC-C	BIO-INFORMATICS	6	4	4	3

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

CONTINUOUS EVALUATION FOR THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT1: TEST	80%	MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE MARKS OBTAINED IN THE TESTS CONDUCTED.

COMPONENT 2: ASSIGNMENT/ SEMINAR/VIVA	20%	ANY ONE COMPONENT
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PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	Short Answer	6 Questions x 1 Mark = 6 Marks
	Answer all questions	6 Questions x 1 Mark = 6 Marks
Part B	Short Essay	8 Questions x 2 Marks = 16 Marks
	Answer any 6 questions	6 Questions x 2 Marks = 12 Marks
Part C	Essay	6 Questions x 3 Marks = 18 Marks
	Answer any 4 questions	4 Questions x 3 Marks = 12 Marks
Part D	Long Essay	4 Questions x 5 Marks = 20 Marks
	Answer any 2 questions	2 Questions x 5 Marks = 10 Marks
Total Marks Including Choice: 60		
Maximum Marks for the Course: 40		

CONTINUOUS EVALUATION FOR PRACTICAL

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT 1: LAB SKILLS, OBSERVATION NOTE AND PUNCTUALITY	20% FOR LAB SKILL 20% FOR OBSERVATION NOTE AND PUNCTUALITY	OBSERVATION NOTE IS MANDATORY. MARKS SHOULD BE GIVEN CONSIDERING OBSERVATION NOTE LAB SKILLS AND PUNCTUALITY.
COMPONENT 1: TEST	60%	MODEL EXAMINATION SHOULD BE CONDUCTED BEFORE EXTERNAL EXAM AND CONSIDERED FOR INTERNAL MARK

END SEMESTER EVALUATION FOR PRACTICAL

*EXCEPT : 2B03CSC ADVANCED C PROGRAMMING - LAB

COMPONENT	PART A	PART B
Code Writing	3	3
Output	3	3
Modification for Part A or Part B	3	
Record	2	
Viva	3	
Total Marks	20	

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION- PRACTICAL

Part A	2 Questions x 10 Mark = 20 Marks	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Part B	2 Questions x 10 Mark = 20 Marks	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Total Marks Including Choice: 40		
Maximum Marks for the Course: 20		

SEMINARS/ASSIGNMENTS/VIVA

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

RECORDS

One rough record (Observation Note) and one fair record are compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works. Record mark is calculated at the time of End Semester Evaluation. Observation notes are compulsory in Lab hours. Students should get signature for each program done in the lab from the faculties and those programs are recommended for fair record.

PROJECT WORK

Every student of B.Sc. Computer Science Programme shall have to work on a project of FIVE credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation at the end of sixth semester. Individual projects are recommended but, in an instance, where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to THREE.

PROJECT EVALUATION

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. Assessment of different components may be taken as below.

CONTINUOUS EVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Punctuality	20%
Relevance of topic System study / Design of tables	20%
Project Report	30%
Presentation & Viva-voce	30%
Total	100%

END SEMESTER EVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Written Synopsis/Abstract	12.5%
Content of the Project	12.5%
Quality of project work/Use of software/ tools	12.5%
Perfection of the work (Designs of tables/ Input & Output forms)	25%
Live demo	12.5%
Viva-voce	25%
Total	100%

KANNUR UNIVERSITY
(Abstract)

BSc Computer Science Programme - Revised Scheme & Syllabus of Core, Complementary and Open Courses under Choice Based Credit Semester System for Under Graduate Programme - implemented with effect from 2014 admission - Orders Issued.

ACADEMIC BRANCH

No. Acad/C2/7857/2014 (1)

Dated, Civil Station P.O, 04 - 07-2014

Read: 1.U.O No. Acad/C2/2232/2014 dated 14-03-2014

2. Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 27-01-2014
3. Minutes of the meeting of the Faculty of Technology held 01-04-2014
4. Letter dated 24.06.2014 from the Chairman, BOS in Computer Science (UG)

ORDER

1. The Revised Regulations for UG Programme under Choice based Credit & Semester System were implemented in this University with effect from 2014 admission as per paper read (1) above.

2. As per paper read (2) above the Board of Studies in Computer Science(UG) finalized the Scheme , Syllabus & model Question Papers for Core, Complementary & open courses of BSc Computer Science programme to be implemented with effect from 2014 admission.

3. As per read (3) above the Faculty of Technology held on 01-04-2014 approved Scheme, syllabus & model question papers for core/complementary & open courses of BSc Computer Science programme to be implemented with effect from 2014 admission.

4. The Chairman, Board of Studies in Computer Science (UG) vide paper read (4) above has submitted the finalized copy of Scheme, syllabus & Model question papers for core/complementary and open courses of BSc Computer Science programme for implementation with effect from 2014 admission.

5. The Vice Chancellor, after examining the matter in detail, and in exercise of the powers of the Academic Council as per section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised scheme, syllabus& model question papers of BSc Computer Science Programme with effect from 2014 admission.

6. Orders, are therefore issued implementing the revised scheme, syllabus & model question papers for core, complementary& open courses of BSc Computer Science programme under CBCSS with effect from 2014 admission subject to report to Academic Council

7. Implemented revised Syllabus is appended.

Sd/-
REGISTRAR

To

1. The Principals of Affiliated Colleges offering B.Sc Computer Science Programme
2. The Examination Branch (through PA to CE)

Copy To:

1. The Chairman, BOS Computer Science (UG)
2. PS to VC/PA to PVC/PA to Registrar
3. DR/AR I Academic
4. Central Library
5. SF/DF/FC.

Forwarded/By Order



Section Officer



❖ For more details log on to www.kannur_university.ac.in

Handwritten initials

KANNUR UNIVERSITY



COURSE STRUCTURE AND SYLLABUS

For

UNDERGRADUATE PROGRAMME

In

COMPUTER SCIENCE

CORE, COMPLEMENTARY

And

OPEN COURSES

Under

CHOICE BASED CREDIT AND SEMESTER SYSTEM

w. e. f. 2014 ADMISSION

**General Guidelines, Curricula, Syllabus and Scheme of examinations
for B.Sc (Computer Science) Programme w.e.f 2014 admission
onwards.**

B.Sc. Computer Science, an undergraduate programme under the Faculty of Technology of Kannur University, consists of Computer Science as core subject with two complimentary subjects. The duration of the programme is six semesters distributed over a period of three years. A semester consists of 90 working days including examination days distributed over a minimum of 18 weeks of five working days each.

COURSES

The number of courses required to complete the programme shall be 40. 'Course' means a segment of subject matter to be covered in a semester (traditionally referred to as paper). The courses include Common Courses including General Course, Complimentary Course, Core Course and Open Course. The break-up of the courses is as follows; Detailed course structure is given in table 1.

Common courses (English + Additional language)	0 6
Common courses (General)	0 4
Complimentary I	0 5
Complimentary II	0 5
Core	1 9
Open Course	0 1
Total	4 0

COURSE STRUCTURE

B.Sc Computer Science[Core]

Semester –I

No.	Course Name	Hours/Week		Credit	Marks
		Theory	Practical		
1	Common course- English I	5		4	50
2	Common course- English II	4		3	50
3	Common course- Additional Language I	5		4	50
4	Core course-1 Introduction to Computers & Programming Languages	1	2	3	50
5	Complementary I (Mathematics)	4		3	50
6	Complementary II	4		3	50
	Total	23	2	20	300

Semester –II

No.	Course Name	Hours/Week		Credit	Marks
		Theory	Practical		
1	Common course- English III	5		4	50
2	Common course- English IV	4		3	50
3	Common course -Additional Language II	5		4	50
4	Core course- 2 Advanced Programming in C	1		2	50
5	Core course -3 Lab-1 Advanced C Programming		2	1	25
6	Complementary I- (Mathematics-II)	4		3	50
7	Complementary II-	4		3	50
	Total	23	2	20	325

Semester –III

No.	Course Name	Hours/Week		Credit	Marks
		Theory	Practical		
1	General course-1 Programming with C++	3	2	4	50
2	General course-2 Digital Electronics	4		4	50
3	Core course-4 Data Structure	3	3	4	50
4	Complementary I (Mathematics-III)	5		3	50
5	Complementary II	5		3	50
	Total	20	5	18	250

Semester –IV

No.	Course Name	Hours/Week		Credit	Marks
		Theory	Practical		
1	General course-3 Database Management System	3		4	50
2	General course-4 Operating System	4		4	50
3	Core course-5 C# and.NET Programming	3		4	50
4	Core course -6 lab –II (Programming with C++ & Data Structure)		2	1	25
5	Core course-7 Lab-II (.NET Programming & DBMS)		3	2	25
6	Complementary I (Mathematics-IV)	5		3	50
7	Complementary II	5		3	50
	Total	20	05	21	300

Semester –V

No.	Course Name	Hours/Week		Credit	Marks
		Theory	Practical		
1	Core course-8 Software Engineering	3		4	50
2	Core course-9 Web Technology	2	3	3	50
3	Core course-10 Java Programming	3	3	4	50
4	Core course -11 Linux Administration	3	2	3	50
5	Core course -12 Elective-I	4		4	50
6	Open Course	2		2	25
	Total	17	08	20	275

Semester –VI

No.	Course Name	Hours/Week		Credit	Marks
		Theory	Practical		
1	Core course-13 System Software	4		3	50
2	Core course-14 Data Communication & Networks	4		3	50
3	Core course-15 Computer Organization	3		3	50
4	Core course -16 Elective-II	4		3	50
5	Core course -17 Lab IV – Java & Shell Programming		3	2	25
6	Core course-18 Lab IV Web Technology		2	2	25
7	Core course -19 Lab V- Project	2	3	5	100
	Total	17	08	21	350

Common course:

Means a course that comes under the category of courses, including compulsory English and additional language courses and a set of general courses. There are 10 common courses for the BSc. Computer Science programme. This includes four English courses (two courses each in first and second semesters), two additional language courses (one course each in first and second semesters) and four General courses (two each in third and fourth semesters). The syllabi of general courses include the topics related to Computer Science.

Complementary Course:

Means a course which is generally related to the core course (traditionally referred to as subsidiary paper). There are two complimentary subjects for BSc. Computer Science programme. The total number of courses offered in each subjects shall be FIVE. Complementary courses are offered during first to fourth semesters.

Core course:

Means a compulsory course in a subject related to a particular degree programme. The core subject Computer Science consists of 13 theory papers, 5 practical papers and 1 project work. The semester wise list of Core and General Courses is given in Table 2.

Open course:

Means a course which can be opted by a student at his/her choice. There shall be one open course in core subjects in the fifth semester. The open course shall be open to all the students in the institution except the students in the parent department. The students can opt for that course from any other department in the institution. Each department can decide the open course from a pool of three courses offered by the university. The list of open courses in Computer Science is given in Table 3. for the purpose of open course B.Sc Computer Science and BCA should be considered as a single department.

Table 2. Scheme of Core and General Courses

No	Se m	Course Code	Course Name	Hours/Week		Credit	Total Crd/s
				Theory	Pract ical		
1	1	1B01CSC	Introduction to Computers & Programming Languages	1	2	3	3
2	2	2B02CSC	Advanced Programming in C	1		2	3
3	2	2B03CSC	Lab-I Advanced C Programming		2	1	
4	3	3A11CSC	Programming with C++	3	2	4	12
5	3	3A12CSC	Digital Electronics	4		4	
6	3	3B04CSC	Data Structure	3	3	4	
7	4	4A13CSC	Database Management System	3		4	15
8	4	4A14CSC	Operating System	4		4	
9	4	4B05CSC	C# and .NET Programming	3		4	
10	4	4B06CSC	Lab-II (Programming with C++ & Data Structure)		2	1	
11	4	4B07CSC	Lab-III (.NET Programming & DBMS)		3	2	
12	5	5B08CSC	Software Engineering	3		4	20
13	5	5B09CSC	Web Technology	2	3	3	
14	5	5B10CSC	Java Programming	3	3	4	
15	5	5B11CSC	Linux Administration	3	2	3	
16	5	5B12CSC	Elective-I	4		4	
17	5	5D---CSC	Open Course	2		2	
18	6	6B13CSC	System Software	4		3	21
19	6	6B14CSC	Data Communication & Networks	4		3	
20	6	6B15CSC	Computer Organization	3		3	
21	6	6B16CSC	Elective -II	4		3	
22	6	6B17CSC	Lab IV- Java & Shell Programming		3	2	
23	6	6B18CSC	Lab V Web Technology		2	2	
24	6	6B19CSC	Project	2	3	5	

Elective –I							
N o	Se m	Course Code	Course Name	Hours/Week		Credit	Marks
				Theor y	Practi cal		
1	5	5B12CSC - E01	Algorithm Analysis and Design	4	--	4	50
2	5	5B12CSC –E02	Computer Graphics	4	--	4	50
3	5	5B12CSC –E03	Data Mining	4	--	4	50
Elective –II							
1	6	6B16CSC – E04	Compiler Design	4	--	3	50
2	6	6B16CSC – E05	Data Compression	4	--	3	50
3	6	6B16CSC – E06	Information Security	4	--	3	50

Table 3. Scheme of OPEN COURSES for 5th Semester

Sl. No	Se m	Course Code	Name of the Course	Hours/ Week	Credit	Marks
1	5	5D01CSC	Programming with C	2	2	25
2	5	5D02CSC	Web Technology	2	2	25
3	5	5D03CSC	Data Base Management System	2	2	25

Scheme of Complementary Courses

No	Sem	Course Code	Course Name	Theory	Practical	Credit	Total credit/s	Marks
1	1	1C01CSC	Fundamentals of Computers & Programming languages	2	2	2	2	40
2	2	2C02CSC	Programming in C	2	2	2	2	40
3	3	3C03CSC	Data Base Management System	3	2	3	3	40
4	4	4C04CSC	Visual Programming	3		3	5	40
5	4	4C05CSC	Lab-I (C Programming, DBMS & Visual Basic)		2	2		40
TOTAL						12		200

CREDITS

Each course shall have certain credits. For passing the BSc. Computer Science programme the student shall be required to achieve a minimum of 120 credits of which 38 credits (14 credits for English courses, 8 credits for Additional language courses and 16 credits for General courses) shall be from common courses. Minimum credits required for core, complementary and open courses put together are 82. The distribution of credits for various courses is given in Table 3.

CREDIT DISTRIBUTION (LRP-COMPUTER SCIENCE)

SUBJECT	SEM	COMMON		GENERAL	CORE	COMPLEMENTARY		OPEN	TOTAL
		ENGLISH	ADDITIONAL			Maths	Stat		
COMPUTER SCIENCE	I	4+3	4	----	3	3	3	----	20
	II	4+3	4	----	2+1	3	3	----	20
	III	----	----	4+4	4	3	3	----	18
	IV	----	----	4+4	4+1+2	3	3	----	21
	V	----	----	----	4+4+4+4+2	----	----	2	20
	VI	----	----	----	3+3+3+3+2+2+5	----	----	----	21
TOTAL		14	8	16	56	12	12	2	120

ATTENDANCE

Minimum 75% attendance is compulsory for theory as well as practical courses, failing which a student is not eligible to appear for university examinations.

SEMINARS/ASSIGNMENTS

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination. The format of the title page of assignment /seminar report is given in Appendix I

PROJECT WORK

Every student of B.Sc. Computer Science Programme shall have to work on a project of **FIVE** credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation at the end of sixth semester. Individual projects are recommended but in an instance where the number of supervising teachers is less, the project may be done

as group. The maximum number of students in a group shall be limited to **THREE**. The format of the title page of Dissertation is given in Appendix II

RECORDS

A record is compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works.

COURSE EVALUATION

The evaluation scheme for each course shall contain two parts

- a) Internal Assessment (IA)
- b) External Evaluation (End Semester Evaluation ESE)

20% weight shall be given to the internal evaluation. The remaining 80% weight shall be for the external evaluation. The distribution of marks for each course is given in Table 4.

Table 4. Scheme of mark distribution of BSc. Computer Science programme

Courses		No. of courses	Marks per course			Total Marks
			Int.	Ext.	Total (Int+Ext)	
Common	English	4	10	40	50	200
	Addl. Language	2	10	40	50	100
General		4	10	40	50	200
Complementary	I (Mathematics)	4	10	40	50	200
	II (Statistics (without Practical)	4	10	40	50	200
	/Electronics/Physics)	5	8	32	40	200
Core	Theory	13	10	40	50	650
	Practical	5	05	20	25	125
	Project	-	20	80	100	100
Open course		1	5	20	25	25
Total						1800

Internal Assessment:

20% of the total marks in each course are for internal assessment. The marks secured for internal assessment only need be sent to university by the colleges concerned. The internal assessment shall be based on a predetermined transparent system involving written test, assignments/ seminars/ Viva and attendance in respect of theory courses and submissions and records, tests and attendance in respect of practical courses. Components with percentage of marks of Internal Evaluation of

Theory Courses are-

Attendance	- 25%
Assignment/ Seminar/Viva	- 25%
Test paper	- 50%

For practical courses-

Attendance	- 25%
Submissions and Record	- 25%
Practical Test Paper	- 50%

(If a fraction appears in total internal marks, nearest whole number is to be taken)

Attendance of each course shall be evaluated as below-

Attendance %	% Marks Allotted
Above 90%	100%
85 to 89%	80%
80 to 84 %	60%
75 to 79 %	40%
Less than 75 %	Not eligible for University exam

Theory External Evaluation:

External evaluation carries 80% of marks. All question papers shall be set by the university. The external examination in theory courses is to be conducted with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined Scheme of valuation and answer keys provided by the University. Details regarding the End Semester Evaluation of core complementary and open courses are given below:

1. Core Courses

- Maximum Marks for each course - **40 Marks**
- Duration of examination - **3 Hrs.**

Sl.No	Type of Question	Marks	Number of Questions to be answered / total number of questions	Max. Marks
01	A bunch of 8 one word answer questions	0.5	08/08	04
02	Short answer	2	07/10	14
03	Short Essay /Programs	3	04/06	12
04	Essay Type	5	02/04	10

2. Complementary Courses

- Maximum Marks for each course - **32 Marks**
- Duration of examination - **3 Hrs.**

Sl.No	Type of Question	Marks	Number of Questions to be answered / total number of questions	Max. Marks
01	A bunch of 6 one word answer questions	0.5	06/06	03
02	Short answer	2	05/08	10
03	Short Essay /Programs	3	03/05	09
04	Essay Type	5	02/04	10

3. Open Course

- Maximum Marks for open course - **20 Marks**
- Duration of examination - **2 Hrs.**

Sl.No	Type of Question	Marks	Number of Questions to be answered / total number of questions	Max. Marks
01	A bunch of 8 one word answer questions	0.5	08/08	04
02	Short answer	2	03/05	06
03	Short Essay /Programs	3	02/04	06
04	Essay Type	4	01/02	04

External Evaluation Practical

External evaluation carries 80% of marks. All question papers shall be set by the university. The external examination in practical courses shall be conducted by **TWO** external examiners appointed by the University. No practical examination will be conducted in odd semester. Practical examinations shall be conducted in the even semester (II, IV and VI). The Scheme of Examinations and Model Question Papers of all the theory and practical courses offered under core, general and open courses are include in the detailed syllabus. Practical examination assessment of different components may be taken as below.

Components	Part A	Part B
Program code	3	3
Error free Execution	2	2
Perfect Output	2	2
Modification	1	1
Viva-voce	2	2
Total	10	10

Project Evaluation

Evaluation of the Project Work shall be done under Mark System at two stages:

- a) Internal Assessment (supervising teachers will assess the project and award internal Marks)
- b) External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

Internal (20% of the Total)			External (80% of Total)		
Components	% of Marks	Marks	Components	% of Marks	Marks
Punctuality	20	04	Writing synopsis/Abstract	12.5	10
			Content of the Report	12.5	10
Relevance of topic System study / Design of tables	20	04	Quality of project work/ Use of software/ tools	12.5	10
			Perfection of the work done (Designs of tables/ Input & Output forms)	25	20
Project Report	30	06	Live demo	12.5	10
Presentation & Viva-voce	30	06	Viva-Voce	25	20
Total	100	20	Total	100	80

External Examiners will be appointed by the University in consultation with the Chairperson of the Board. Project evaluation shall be done along with the external examination of Core Practical lab IV & V in sixth semester.


KANNUR UNIVERSITY

(Abstract)

BA Economics /Development Economics Programmes - Revised Scheme, Syllabi and Model Question Papers - Core/Complementary/Open Courses under Choice Based Credit Semester System-Implemented with effect from 2014 Admission - Orders issued.

ACADEMIC BRANCH

U.O No. Acad/C1/4271/2014

Dated, Civil Station (PO). 3-05-2014

- Read: 1. U.O.No.Acad/C2/2232/2014 dated 14/03/2014
2. Minutes of the meeting of the Board of Studies in Economics UG held on 15-01-2014
3. Minutes of the meeting of the Faculty of Humanities held on 27-03-2014
4. Letter dated 11-04-2014 from the Chairman, Board of Studies Economics UG

ORDER

1. The Revised Regulations for Choice based Credit Semester System have been implemented in this University with effect from 2014 admission vide paper read (1) above.

2. As per the paper read (2) above, Board of Studies in Economics (UG) finalized the Scheme, Syllabi and Model Question Papers for BA Economics/Development Economics under Choice Based Credit Semester System with effect from 2014 admission.

3. As per the paper read (3) above the meeting of Faculty of Humanities approved the Scheme, Syllabi and Model question papers for BA Economics/Development Economics w.e.f.2014 admission.

4. The Chairman, Board of Studies in Economics (UG), vide paper (4) read above has forwarded the Scheme, Syllabi and Model Question Papers for BA Economics/Development Economics for implementation with effect from 2014 admission.

5. The Vice Chancellor after considering the matter in detail and in exercise of the powers of Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement the revised Scheme, Syllabi and Model Question Papers (Core/Complementary/Open Courses) for BA Economics/Development Economics under Choice Based Credit Semester System with effect from 2014 admission subject to report Academic Council.

6. Orders are, therefore, issued accordingly.

7. The Implemented Scheme, Syllabi and Model Question Papers are appended.

Sd/-
DEPUTY REGISTRAR (Academic)
For REGISTRAR

To
The Principals of Colleges offering BA Economics/Developing Economics Programme.

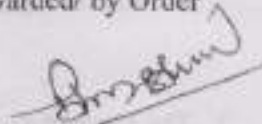
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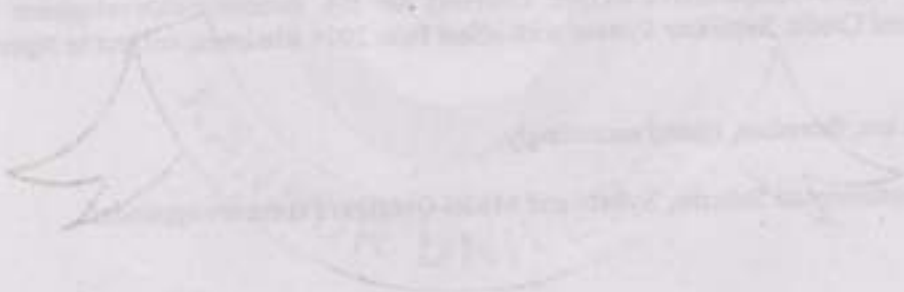
1. The Examination Branch (through PA to CE)
2. PS to VC/PA to /PA to Registrar /
3. Chairman BOS Economics (UG)
4. PA to CE
5. DR/AR I Academic
6. SF/DF/FC.



Forwarded/ by Order


Section Officer

For more details; log on www.kannuruniversity.ac.in



KANNUR UNIVERSITY



COURSE STRUCTURE

SYLLABUS

And

MODEL QUESTION PAPERS

For

BA ECONOMICS/DEVELOPMENT ECONOMICS

Under

**Kannur University Regulations for
Choice Based Credit and Semester System
For Under-Graduate Curriculum 2014
(KUCBCSSUG 2014)**

KANNUR UNIVERSITY
BOARD OF STUDIES IN ECONOMICS (UG)
RESTRUCTURED CURRICULUM OF UNDERGRADUATE ECONOMICS PROGRAMME
2014 Admission onwards

Economics is one of the most dynamic and fast growing disciplines coming under the purview of social sciences. Its horizon begins from the boundary of social sciences but expands comprehensively to other sciences on account of its relatively fairer degree of objectivity and profoundly greater strength of applicability of quantitative techniques. Its widening perspectives and high degree of adaptability and flexibility to link itself with other sciences make it a unique field of interdisciplinary and multidisciplinary advancement of scientific knowledge. Finding knowledge gaps and filling these gaps are happening in this field at a remarkable pace and intensity. Thus, complicated socio-economic problems get transitory or enduring solutions.

Association of economics with management studies, environmental sciences, demography, health sciences, etc. has opened multiple branches of economics. Environmental economics, resource economics, managerial economics, gender economics, health economics, etc. are few such branches. Besides these interdisciplinary and multidisciplinary areas of scientific knowledge, economics has its newer branches like constitutional economics, econophysics, neuro-economics etc.

Economics uses the tools of various disciplines like management studies, mathematics, statistics, and their sophisticated software and has become an integral part of knowledge explosion. It has interdisciplinary approaches in teaching and learning, research and exploration, and formulation and application of socio political and economic policies. Combining these advancements with our great achievements in science and technology we can make our farms and firms less risky . For this we need to connect our knowledge and research centers directly or indirectly with the farms and firms. Along with the establishment of research and knowledge centers we need to enrich and update the syllabi at the undergraduate level, which is the very foundation of Higher Education. The ongoing syllabi at the undergraduate level are not a perfect and smooth continuation and expansion of the syllabi at Higher Secondary level of education. They need modifications and improvements in tune with the latest developments in economic thought, technique and analysis, and the rapidly changing socio-economic environment of our country.

The revised syllabi, a product of a series of workshops conducted under the aegis of the U G Board of Studies and enriched by the active participation of faculty members, research scholars and experts of academia, are expected to impart professionalism and provide insight into the newly emerging areas of knowledge. A good number of teachers and academicians within and outside the State have contributed their knowledge, experience and service to this academic exercise. The deliberation of the experts from various fields and existing syllabi of different universities have been immensely used for framing the new syllabi of the BA Economics Programme. It is also to be pointed out that before finalizing the syllabi, experts from other universities were consulted and their suggestions incorporated. The new and revised syllabi are expected to meet the requirements of the time and materialize the mission and vision of the Higher Education.

DR NJ SALEENA
Chairperson, Board of Studies in Economics (UG)
Kannur University

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TABLE FOR COURSE STRUCTURE FOR BA
ECONOMICS/DEVELOPMENT ECONOMICS PROGRAMME

Subject	Sem	Common Course			General	Core					Compleme ntary		Open	Total
		English (First Language)	HIN/MAL/URD (Second Language)			Economics								
English Literat ure & Langua ge	I	4	3	4	5					4	-		20	
	II	4	3	4	4					4	-		19	
	III	4		4	5	4					4		21	
	IV	4		4	4	4					4		20	
	V	----		---	4	4	4	4	4			2	22	
	VI				4	4	4	4	2				18	
	Total	22 Credits (300 Marks)		16 Credits (200 Marks)		64 Credits (775 Marks)					8	8	2	120
	38 Credits (500 Marks)				82 Credits (1000 Marks)					16 Credits (200 Marks)		2Credits (25 Marks)		
Grand Total													1500 Marks	
Total Credit													120	

B A ECONOMICS/ DEVELOPMENT ECONOMICS

Total number of Common courses : 10

Total Credit : 38

Total number of

a) Core courses : 15+Project work

b) Complementary Courses : 4

Total Credits

a) Core courses : 64

b) Complementary Courses : 16

Total number of Open Courses : 1

Total Credits : 2

Total Credit for B A Programme : 120

Scheme and Marks Distribution for BA Programme in Economics

Sem	Course	Course Code	Name of the Paper	Hours/ week	Credit	Marks
1	Common	1A01ENG	Common Course I English	5	4	40+10=50
	Common	1A02ENG	Common Course II English	4	3	40+10=50
	Common (Language)	1A07MAL/HIN/ ARB/URD	Common Course I Additional Language	4	4	40+10=50
	Core	1B01ECO	Micro Economic Analysis-I	6	5	40+10=50
	Complimentary	1C0	Complimentary I	6	4	40+10=50
2	Common	2A03ENG	Common Course III English	5	4	40+10=50
	Common	2A04ENG	Common Course IV English	4	3	40+10=50
	Common (Language)	2A08MAL/HIN/ ARB/URD	Common Course II Additional Language	4	4	40+10=50
	Core	2B02ECO	Micro Economic Analysis-II	6	4	40+10=50
	Complementary	2C0	Complimentary II	6	4	40+10=50
3	Common	3A05ENG	Common Course V English	5	4	40+10=50
	Common (Language)	3A09 MAL/HIN/ ARB/URD	Common Course III Additional Language	5	4	40+10=50
	Core	3B03ECO	Macro Economic Analysis-I	5	5	40+10=50
	Core	3B04ECO	International Economics	4	4	40+10=50
	Complementary	3C0	Complimentary 1	6	4	40+10=50
4	Common	4A06ENG	Common Course VI English	5	4	40+10=50
	Common (Language)	4A10MAL/HIN/ ARB/URD	Common Course IV Additional Language	5	4	40+10=50
	Core	4B05ECO	Macro Economic Analysis-II	5	4	40+10=50
	Core	4B06ECO	Environmental Economics	4	4	40+10=50
	Complementary	4C0	Complimentary II	6	4	40+10=50
5	Open	5D0ECO	-----	2	2	20+05=25
	Core	5B07ECO	Basic Tools for Economic Analysis-1	6	4	40+10=50
	Core	5B08ECO	Alternative Economics	4	4	40+10=50
	Core	5B09ECO	Research Methods and Techniques for Economic Analysis	4	4	40+10=50
	Core Core	5B10ECO 5B11ECO	Development Economics Economics of Banking and Finance	4 5	4 4	40+10=50 40+10=50
6	Core	6B12ECO	Basic Tools for Economic Analysis-II	6	4	40+10=50
	Core	6B13ECO	Central Themes in Indian Economy	5	4	40+10=50
	Core	6B14ECO	Public Economics	6	4	40+10=50
	Core	6B15ECO	Basic Econometric analysis	5	4	40+10=50
	Project	6B16 ECO(Pr)	Project	3	2	20+05=25

CORE COURSES

- **MICRO ECONOMIC ANALYSIS I**
- **MICRO ECONOMIC ANALYSIS II**
- **MACRO ECONOMIC ANALYSIS I**
- **INTERNATIONAL ECONOMICS**
- **MACRO ECONOMIC ANALYSIS II**
- **ENVIRONMENTAL ECONOMICS**
- **BASIC TOOLS FOR ECONOMIC ANALYSIS I**
- **ALTERNATIVE ECONOMICS**
- **RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS**
- **DEVELOPMENT ECONOMICS**
- **ECONOMICS OF DEVELOPMENT AND PLANNING 1**
- **ECONOMICS OF BANKING AND FINANCE**
- **BASIC TOOLS FOR ECONOMIC ANALYSIS II**
- **CENTRAL THEMES IN INDIAN ECONOMY**
- **ECONOMICS OF DEVELOPMENT AND PLANNING 11**
- **PUBLIC ECONOMICS**
- **BASIC ECONOMETRIC ANALYSIS**
- **PROJECT**

COMPLEMENTARY COURSES

ECONOMICS / NON ECONOMICS FACULTY

- **MATHEMATICS FOR ECONOMIC ANALYSIS- I**
- **MATHEMATICS FOR ECONOMIC ANALYSIS- II**
- **MATHEMATICAL ECONOMICS-I**
- **MATHEMATICAL ECONOMICS-II**
- **INTRODUCTORY ECONOMICS- I (FOR NON ECONOMICS FACULTY ONLY)**
- **INTRODUCTORY ECONOMICS- II (FOR NON ECONOMICS FACULTY ONLY)**
- **HISTORY OF ECONOMIC THOUGHT-I**
- **HISTORY OF ECONOMIC THOUGHT-II**
- **POPULATION STUDIES**
- **REGIONAL ECONOMICS**
- **AGRICULTURAL ECONOMICS**
- **GENDER ECONOMICS**

OPEN COURSES

Six open Courses are listed during the V Semester. Colleges have the freedom to select any one of the Open Courses.

Semester-V

- **ECONOMICS OF TRAVEL AND TOURISM**
- **KERALA ECONOMY**
- **ECONOMICS OF SHARE MARKET**

COURSE STRUCTURE FOR BA ECONOMICS/DEVELOPMENT ECONOMICS

TABLE FOR COMMON COURSES

Sl No.	Semester	Course Code	Title of the paper	Contact Hour/week	Credits	Marks
1	1	1A01ENG	Common Course I English	5	4	40+10=50
2	1	1A02ENG	Common Course II English	4	3	40+10=50
3	1	1A07MAL/HIN/ARB/URD	Common Course I Additional	4	4	40+10=50
4	11	2A03 ENG	Common Course III English	5	4	40+10=50
5	11	2A04 ENG	Common Course IV English	4	3	40+10=50
6	11	2A08MAL/HIN/ARB/URD	Common Course II Additional	4	4	40+10=50
7	111	3A05ENG	Common Course V English	5	4	40+10=50
8	111	3A09MAL/HIN/ARB/URD	Common Course III Additional	5	4	40+10=50
9	IV	4A06ENG	Common Course VI English	5	4	40+10=50
10	IV	4A10MAL/HIN/ARB/URD	Common Course IV Additional	5	4	40+10=50

TABLE FOR CORE COURSES: BA ECONOMICS PROGRAMME

SL. No	Semester	Course Code	Name of the paper	Contact Hour/ week	Credits
1	I	1B01ECO	Micro Economic Analysis-I	6	5
2	II	2B02ECO	Micro Economic Analysis-II	6	4
3	III	3B03ECO	Macro Economic Analysis-I	5	5
4	III	3B04ECO	International Economics	4	4
5	IV	4B05ECO	Macro Economic Analysis-II	5	4
6	IV	4B06ECO	Environmental Economics	4	4
7	V	5B07ECO	Basic Tools for Economic Analysis-I	6	4
8	V	5B08ECO	Alternative Economics	4	4
9	V	5B09ECO	Research Methods and Techniques for Economic Analysis	4	4
10	V	5B10ECO	Development Economics	4	4
11	V	5B11ECO	Economics of Banking and Finance	5	4
12	VI	6B12ECO	Basic Tools for Economic Analysis-II	6	4
13	VI	6B13ECO	Central Themes in Indian Economy	5	4
14	VI	6B14ECO	Public Economics	6	4
15	VI	6B15ECO	Basic Econometric Analysis	5	4
16	VI	6B16 ECO (Pr)	Project	3	2

**TABLE FOR CORE COURSES: BA DEVELOPMENT ECONOMICS
PROGRAMME**

SL. No	Semester	Course Code	Title of the course	Contact Hour/week	Credits
1	I	1B01ECO	Micro Economic Analysis-I	6	5
2	II	2B02ECO	Micro Economic Analysis-II	6	4
3	III	3B03ECO	Macro Economic Analysis-I	5	5
4	III	3B04ECO	International Economics	4	4
5	IV	4B05ECO	Macro Economic Analysis-II	5	4
6	IV	4B06ECO	Environmental Economics	4	4
7	V	5B07ECO	Basic Tools for Economic Analysis-I	6	4
8	V	5B08ECO	Alternative Economics	4	4
9	V	5B09ECO	Research Methods and Techniques for Economic Analysis	4	4
10	V	5B10 DEV ECO	Economics of Development and Planning -I	4	4
11	V	5B11ECO	Economics of Banking and Finance	5	4
12	VI	6B12ECO	Basic Tools for Economic Analysis-II	6	4
13	VI	6B13 DEV ECO	Economics of Development and Planning -II	5	4
14	VI	6B14ECO	Public Economics	6	4
15	VI	6B15ECO	Basic Econometric Analysis	5	4
16	VI	6B16DEV ECO(Pr)	Project	3	2

**TABLE FOR COMPLEMENTARY COURSES: BA ECONOMICS/
DEVELOPMENT ECONOMICS PROGRAMME**

SL. No	Semester	Course Code	Title of the course	Contact Hours/week	Credits
1	I	1C01ECO	Mathematics for Economic Analysis-I	6	4
2	II	2C02ECO	Mathematics for Economic Analysis-II	6	4
3	III	3C03ECO	Mathematical Economics-I	6	4
4	IV	4C04ECO	Mathematical Economics-II	6	4
5	I	1C05ECO	Introductory Economics-I(Non Economics Programmes Only)	6	4
6	II	2C06ECO	Introductory Economics-II (For Non Economic Programmes Only)	6	4
7	III	3C07ECO	History of Economic Thought-I	6	4
8	IV	4C08ECO	History of Economic Thought-II	6	4
9	1	1C09ECO	Population Studies	6	4
10	II	2C10ECO	Regional Economics	6	4
11	III	3C11ECO	Agricultural Economics	6	4
12	IV	4C12ECO	Gender Economics	6	4

**TABLE FOR OPEN COURSES: BA ECONOMICS/ DEVELOPMENT
ECONOMICS**

SEMESTER-V

Sl.No	Course Code	Title of the course	Contact Hours/week	Credits
1	5D01ECO	Economics of Travel and Tourism	2	2
2	5D02ECO	Kerala Economy	2	2
3	5D03ECO	Economics of Share Market	2	2

B A ECONOMICS PROGRAMME
CORE COURSE STRUCTURE

Sl. No	Course Code	Name of the paper	Semester in which the paper is offered	Credits for each paper	Contact hours per week	Examination Time	Marks
1	1B01ECO	Micro Economic Analysis-I	I	5	6	3 hrs	40+10=50
2	2B02ECO	Micro Economic Analysis-II	II	4	6	3 hrs	40+10=50
3	3B03ECO	Macro Economic Analysis-I	III	5	5	3 hrs	40+10=50
4	3B04ECO	International Economics	III	4	4	3 hrs	40+10=50
5	4B05ECO	Macro Economic Analysis-II	IV	4	5	3 hrs	40+10=50
6	4B06ECO	Environmental Economics	IV	4	4	3 hrs	40+10=50
7	5B07ECO	Basic Tools for Economic Analysis-I	V	4	6	3 hrs	40+10=50
8	5B08ECO	Alternative Economics	V	4	4	3 hrs	40+10=50
9	5B09ECO	Research Methods and Techniques for Economic Analysis	V	4	4	3 hrs	30+10★ + 10=50
10	5B10ECO	Development Economics	V	4	4	3 hrs	40+10=50
11	5B11ECO	Economics of Banking and Finance	V	4	5	3 hrs	40+10=50
12	6B12ECO	Basic Tools for Economic Analysis-II	VI	4	6	3 hrs	40+10=50
13	6B13ECO	Central Themes in Indian Economy	VI	4	5	3 hrs	40+10=50
14	6B14ECO	Public Economics	VI	4	6	3 hrs	40+10=50
15	6B15ECO	Basic Econometric Analysis	VI	4	5	3 hrs	40+10=50
	6B16ECO (Pr)	Project	VI	2	3	-----	20+5=25

★Computer Practical

**B A DEVELOPMENT ECONOMICS PROGRAMME
CORE COURSES STRUCTURE**

Sl. No	Course Code	Name of the paper	Semester in which the paper is offered	Credits for each paper	Contact hours per week	Examination Time	Marks
1	1B01ECO	Micro Economic Analysis-I	I	5	6	3 hrs	40+10=50
2	2B02ECO	Micro Economic Analysis-II	II	4	6	3 hrs	40+10=50
3	3B03ECO	Macro Economic Analysis-I	III	5	5	3 hrs	40+10=50
4	3B04ECO	International Economics	III	4	4	3 hrs	40+10=50
5	4B05ECO	Macro Economic Analysis-II	IV	4	5	3 hrs	40+10=50
6	4B06ECO	Environmental Economics	IV	4	4	3 hrs	40+10=50
7	5B07ECO	Basic Tools for Economic Analysis-I	V	4	6	3 hrs	40+10=50
8	5B08ECO	Alternative Economics	V	4	4	3 hrs	40+10=50
9	5B09ECO	Research Methods and Techniques for Economic Analysis	V	4	4	3 hrs	30+10* + 10=50
10	5B10DEV ECO	Economics of Development and Planning -I	V	4	4	3 hrs	40+10=50
11	5B11ECO	Economics of Banking and Finance	V	4	5	3 hrs	40+10=50
12	6B12ECO	Basic Tools for Economic Analysis-II	VI	4	6	3 hrs	40+10=50
13	6B13DEV ECO	Economics of Development and Planning -II	VI	4	5	3 hrs	40+10=50
14	6B14ECO	Public Economics	VI	4	6	3 hrs	40+10=50
15	6B15ECO	Basic Econometric Analysis	VI	4	5	3 hrs	40+10=50
	6B16DEV ECO(Pr)	Project	VI	2	3		20+05=25

★Computer Practical

**B A ECONOMICS/DEVELOPMENT ECONOMICS PROGRAMME
COMPLEMENTARY COURSES**

Sl. No	Course Code	Name of the paper	Semester in which the paper is offered	Credits for each paper	Contact hours per week	Examination Time	Marks
1	1C01ECO	Mathematics for Economic Analysis-I	I	4	6	3 hrs	40+10=50
2	2C02ECO	Mathematics for Economic Analysis-II	II	4	6	3 hrs	40+10=50
3	3C03ECO	Mathematical Economics-I	III	4	6	3 hrs	40+10=50
4	4C04ECO	Mathematical Economics-II	IV	4	6	3 hrs	40+10=50
5	1C05ECO	Introductory Economics-I(Non Economics Programmes Only)	I	4	6	3 hrs	40+10=50
6	2C06ECO	Introductory Economics-II(For Non Economic Programmes Only)	II	4	6	3 hrs	40+10=50
7	3C07ECO	History of Economic Thought-I	III	4	6	3 hrs	40+10=50
8	4C08ECO	History of Economic Thought-II	IV	4	6	3 hrs	40+10=50
9	1C09ECO	Population Studies	I	4	6	3 hrs	40+10=50
10	2C10ECO	Regional Economics	II	4	6	3 hrs	40+10=50
11	3C11ECO	Agricultural Economics	III	4	6	3 hrs	40+10=50
12	4C12ECO	Gender Economics	IV	4	6	3 hrs	40+10=50

**B A ECONOMICS/DEVELOPMENT ECONOMICS
OPEN COURSES**

Six open Courses are listed during the V Semester. The Colleges have the freedom to select any one of the Open Courses.

SEMESTER-V

Sl. No	Course Code	Name of the paper	Semester in which the paper is offered	Credits for each paper	Contact hours per week	Examination Time	Marks
1	5D01ECO	Economics of Travel and Tourism	V	2	2	2hrs	20+5=25
2	5D02ECO	Kerala Economy	V	2	2	2 hrs	20+5=25
3	5D03ECO	Economics of Share Market	V	2	2	2hrs	20+5=25

B.A.ECONOMICS/DEVELOPMENT ECONOMICS
COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM
(Effective from 2014-2015)

Semester I

Course Code	Course Category	Course Title	Hour	Credit	Examination Time
1A01ENG	Common Course (English)	- -----	5	4	3hrs
1A02ENG	Common Course (English)	-----	4	3	3hrs
1A07/MAL/HIN/ARB/URD	Common Course (Language)	-----	4	4	3hrs
1B01ECO	Core Course	Micro Economic Analysis-1	6	5	3hrs
IC	Complementary Course		6	4	3hrs

B.A.ECONOMICS/DEVELOPMENT ECONOMICS
COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM
(Effective from 2014-2015)

Semester II

Course Code	Course Category	Course Title	Hour	Credit	Examination Time
2A03ENG	Common Course (English)	-----	5	4	3hrs
2A04ENG	Common Course (English)	-----	4	3	3hrs
2A08/MAL/HIN/ARB/URD	Common Course (Language)	-----	4	4	3hrs
2B02ECO	Core Course	Micro economic Analysis-11	6	4	3hrs
2C	Complementary Course		6	4	3hrs

B.A.ECONOMICS/DEVELOPMENT ECONOMICS
COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM
(Effective from 2014-2015)
Semester III

Course Code	Course Category	Course Title	Hour	Credit	Examination Time
3A05ENG	Common Course (English)	-----	5	4	3hrs
3A09/MAL/HIN/ARB/URD	Common Course (Language)	-----	5	4	3hrs
3B03ECO	Core Course	Macroeconomic Analysis-1	5	5	3hrs
3B04ECO	Core Course	International Economics	4	4	3hrs
3C	Complementary Course	-----	6	4	3hrs

B.A.ECONOMICS/DEVELOPMENT ECONOMICS
COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM
(Effective from 2014-2015)
Semester IV

Course Code	Course Category	Course Title	Hour	Credit	Examination Time
4A06ENG	Common Course (English)	-----	5	4	3hrs
4A10/MAL/HIN/ARB/URD	Common Course (Language)	-----	5	4	3hrs
4B05ECO	Core Course	Macro economic Analysis-11	5	4	3hrs
4B06ECO	Core Course	Environmental Economics	4	4	3hrs
4C	Complementary Course	-----	6	4	3hrs

B.A.ECONOMICS
COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM
(Effective from 2014-2015)
Semester V

Course Code	Course Category	Course Title	Hour	Credit	Examination Time
5DECO	Open Course	-----	2	2	2hrs
5B07ECO	Core Course	Basic Tools for Economic Analysis-1	6	4	3hrs
5B08ECO	Core Course	Alternative Economics	4	4	3hrs
5B09ECO	Core Course	Research Methods and Techniques for Economic Analysis	4	4	2hrs+Practicals
5B10ECO	Core Course	Development Economics	4	4	3hrs
5B11ECO	Core Course	Economics of Banking and Finance	5	4	3hrs

B.A. DEVELOPMENT ECONOMICS
COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM
(Effective from 2014-2015)
Semester V

Course Code	Course Category	Course Title	Hour	Credit	Examination Time
5D ECO	Open Course	-----	2	2	2hrs
5B07ECO	Core Course	Basic Tools for Economic Analysis-1	6	4	3hrs
5B08ECO	Core Course	Alternative Economics	4	4	3hrs
5B09ECO	Core Course	Research Methods and Techniques for Economic Analysis	4	4	2hrs+Practicals
5B10DEVECO	Core Course	Economics of Development and Planning-1	4	4	3hrs
5B11ECO	Core Course	Economics of Banking and Finance	5	4	3hrs

B.A.ECONOMICS
COURSE STRUCTURE UNDER CHOICE BASED CREDIT SYSTEM
(Effective from 2014-2015)
Semester VI

Course Code	Course Category	Course Title	Hour	Credit	Examination Time
6B12ECO	Core Course	Basic Tools for Economic Analysis-II	6	4	3hrs
6B13ECO	Core Course	Central Themes in Indian Economy	5	4	3hrs
6B14ECO	Core Course	Public Economics	6	4	3hrs
6B15ECO	Core Course	Basic Econometric Analysis	5	4	3hrs
6B16ECO(Pr)	Core Course	Project	3	2	

B.A.DEVELOPMENT ECONOMICS
COURSE STRUCTURE UNDER CHOICE BASED CREDIT SYSTEM
(Effective from 2014-2015)
Semester VI

Course Code	Course Category	Course Title	Hour	Credit	Examination Time
6B12ECO	Core Course	Basic Tools for Economic Analysis-II	6	4	3hrs
6B13DEVECO	Core Course	Economics of Development and Planning-11	5	4	3hrs
6B14ECO	Core Course	Public Economics	6	4	3hrs
6B15ECO	Core Course	Basic Econometric Analysis	5	4	3hrs
6B16 DEVECO (Pr)	Core Course	Project	3	2	



KANNUR UNIVERSITY
(Abstract)

B.A. Economics/ Development Economics Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

ACADEMIC BRANCH

No.Acad.C1/12530/2019

Dated, Civil Station P.O., 20 .06. 2019

- Read:-
1. U.O.No.Acad.C2/429/2017 dated,10-10-2017
 2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
 3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.
 4. The Minutes of the Meeting of the Board of Studies in Economics (UG) held on 07.06.2019
 5. Letter and Syllabus of B.A. Economics/ Development Economics Programme , Submitted by the Chairperson, Board of Studies in, Economics (UG) dated , 15.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies ,Workshops, discussions etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Economics (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.A.Economics/ Development Economics Programmes to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Economics (UG) submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.A. Economics/ Development Economics Programmes for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper (Core/Complementary Elective/Generic Elective Course) of B.A Economics/ Development Economics programmes under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.A Economics/ Development Economics Programmes are uploaded in the University website.
(www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-

DEPUTY REGISTRAR(ACADEMIC)
For REGISTRAR

To

The Principals of Colleges offering B.AEconomics/ Development Economics Programme

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Economics (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC



Forwarded/By Order


SECTION OFFICER



KANNUR UNIVERSITY

BOARD OF STUDIES, ECONOMICS (UG)

SYLLABUS FOR B A PROGRAMME IN ECONOMICS/DEVELOPMENT ECONOMICS CORE, COMPLEMENTARY ELECTIVE COURSE AND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY



VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

PROGRAMME OUTCOMES (PO)

PO1. Critical Thinking

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO2. Effective Citizenship

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO3. Effective Communication

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO4. Inter disciplinarity

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

Economic science has become one of the most dynamic and complex disciplines across natural, physical and social sciences. Its scientific as well as dynamic character has strengthened not only the scope of economics but positively contributed to other streams of knowledge as well. The new BA syllabi of Kannur University have greater scope for using mathematical and statistical techniques, apart from theory and policy. Further it has become more interdisciplinary or/ and multidisciplinary in terms of methods of enquiry and modes of analysis. In the revised syllabi we have incorporated new frontiers of economics such as gender economics, economic geography, economic history, heterodox economics, econometrics and mathematical economics. These interdisciplinary /multidisciplinary areas will strengthen the integrated knowledge profile of the students. Restructuring was done under the initiative of Kannur University and the active involvement of the Members of the Board of Studies in Economics (UG) through a series of deliberations and discussions. In order to make it more participatory and democratic, we have organized a two day workshop to finalize the restructured curriculum and the outcome based syllabi for the BA Economics Programme. Undergraduate economics teachers of all colleges affiliated to Kannur University have actively participated in the workshop and made significant contributions towards the Outcome Based Under Graduate Education. Apart from teachers of affiliated colleges, faculty members of national repute have been invited as resource persons to streamline the syllabi in terms of method, content, and integrity of its epistemology. The basic objective of the revised syllabi is to equip our undergraduates to face the academic and real life challenges in the fast changing world tuned by knowledge revolution, science, technology, research and development. We believe that the revised curriculum and syllabi may open new horizons of knowledge and meet the vision and mission of higher education in the country. It is our privilege to introduce the revised curriculum and syllabi before the fresh undergraduates who are getting enrolled in June 2019 onwards and other stake holders of Economics Undergraduate Education.

Dr. A. Ashokan
Chairperson
Board of Studies, Economics (UG)
Kannur University

Kannur University
Programme Specific Outcome of B.A Economics /
Development Economics Programme

The revised curriculum and syllabi of BA Economics Programme of Kannur University provide a structure of core courses, complementary elective courses and generic elective courses. Diversified course structure will contribute towards all round development of the student. The undergraduate programme in economics borrows ideas and techniques from a variety of other disciplines including history, geography, mathematics, statistics, management and environmental science. An undergraduate programme with sound footing in economic theory and empirics would equip the students to a range of career options in the field of economics, finance, commerce, entrepreneurship and management. The specific outcomes of the programme are summarized below:

1. The programme with structured curricula will support the academic development of the undergraduates.
2. The programme will provide the students with the opportunity to pursue courses that emphasize quantitative, qualitative and theoretical aspects of economics.
3. The programme will provide a well resourced teaching learning environment for the students of economics, which will definitely lead to the ultimate educational goal of “learning to be”.
4. The programme will promote academic writing, critical thinking and research aptitude among the students.
5. Needless to point out, the students will gain a source of livelihood by expanding their skill set and widening their knowledge horizon.

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KANNUR UNIVERSITY
B A ECONOMICS PROGRAMME
WORK AND CREDIT DISTRIBUTION STATEMENT

(BA: Common English: 22, Additional Common: 16, Core: 64,
 First Complementary Elective: 8, Second Complementary Elective: 8, Generic Elective: 2)

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	Common English I	4	5	20	25
	Common English II	3	4		
	Additional Common I	4	4		
	Microeconomic Analysis I	5	6		
	Complementary I	4	6		
II	Common English III	4	5	19	25
	Common English IV	3	4		
	Additional Common II	4	4		
	Microeconomic Analysis II	4	6		
	Complementary II	4	6		
III	Common English V	4	5	21	25
	Additional Common III	4	5		
	Central Themes in Indian Economy	5	5		
	International Economics	4	4		
	Complementary III	4	6		
IV	Common English VI	4	5	20	25
	Additional Common IV	4	5		
	Research Methods and Techniques for Economic Analysis	4	5		
	Environmental Economics	4	4		
	Complementary IV	4	6		
V	Generic Elective Course	2	2	22	25
	Basic Tools for Economic Analysis I	4	6		
	Heterodox Economics	4	4		
	Macroeconomic Analysis I	4	5		
	Development Economics	4	4		
VI	Economics of Banking and Finance	4	4	18	25
	Basic Tools for Economic Analysis II	4	6		
	Macroeconomic Analysis II	4	5		
	Public Economics	4	5		
	Basic Econometric Analysis	4	6		
Project	2	3			
Total				120	150
Total Marks for Economics Programme		1525			

PART A:

ECONOMICS CORE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTR	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS (EXT+INT)
1 B 01ECO	MICRO-ECONOMIC ANALYSIS I	I	6	5	3	40+10=50
2 B 02 ECO	MICRO-ECONOMIC ANALYSIS II	II	6	4	3	40+10=50
3 B03 ECO	CENTRAL THEMES IN INDIAN ECONOMY	III	5	5	3	40+10=50
3 B04 ECO	INTERNATIONAL ECONOMICS	III	4	4	3	40+10=50
4 B05 ECO	RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS	IV	5	4	2+1*	30+10+10* =50
4B06 ECO	ENVIRONMENTAL ECONOMICS	IV	4	4	3	40+10=50
5D 01ECO	GENERIC ELECTIVE	V	2	2	2	20+5=25
5 B07 ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS I	V	6	4	3	40+10=50
5 B08 ECO	HETERODOX ECONOMICS	V	4	4	3	40+10=50
5 B 09ECO	MACROECONOMIC ANALYSIS I	V	5	4	3	40+10=50
5 B10 ECO	DEVELOPEMNT ECONOMICS	V	4	4	3	40+10=50
5 B11ECO	ECONOMICS OF BANKING AND FINANCE	V	4	4	3	40+10=50
6 B12 ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS II	VI	6	4	3	40+10=50
6 B13 ECO	MACROECONOMIC ANALYSIS II	VI	5	4	3	40+10=50
6 B14 ECO	PUBLIC ECONOMICS	VI	5	4	3	40+10=50
6 B15 ECO	BASIC ECONOMETRIC ANALYSIS	VI	6	4	3	40+10=50
6 B16 ECO	PROJECT**	VI	3	2	PROJECT EVALUATION	**25+25=50
	TOTAL			66		825

*Computer practical

** 25 marks each for Internal and External evaluation

PART A:

DEVELOPMENT ECONOMICS CORE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS
1 B 01 DEV ECO	MICRO-ECONOMIC ANALYSIS I	I	6	5	3	40+10=50
2 B 02 DEV ECO	MICRO-ECONOMIC ANALYSIS II	II	6	4	3	40+10=50
3 B03 DEV ECO	THEORIES OF ECONOMIC DEVELOPEMNT	III	5	5	3	40+10=50
3 B04 DEVECO	INTERNATIONAL ECONOMICS	III	4	4	3	40+10=50
4 B05 DEVECO	RESEARCH METHODS AND TECHNIQUES FOR ECONOMICS ANALYSIS	IV	5	4	2+1*	30+10+10*=50
4B06 DEVECO	ENVIRONMENTAL ECONOMICS	IV	4	4	3	40+10=50
5D 01 DEV ECO	GENERIC ELECTIVE	V	2	2	2	20+5=25
5 B07 DEV ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS I	V	6	4	3	40+10=50
5 B08 DEV ECO	HETERODOX ECONOMICS	V	4	4	3	40+10=50
5 B 09 DEVECO	MACROECONOMIC ANALYSIS I	V	5	4	3	40+10=50
5 B10 DEV ECO	DEVELOPMENT PLANNING: TOOLS AND TECHNIQUES	V	4	4	3	40+10=50
5 B11 DEV ECO	ECONOMICS OF BANKING AND FINANCE	V	4	4	3	40+10=50
6 B12 DEV ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS II	VI	6	4	3	40+10=50
6 B13 DEV ECO	MACROECONOMIC ANALYSIS II	VI	5	4	3	40+10=50
6 B14 DEV ECO	PUBLIC ECONOMICS	VI	5	4	3	40+10=50
6 B15 DEV ECO	BASIC ECONOMETRIC ANALYSIS	VI	6	4	3	40+10=50
6 B16 DEV ECO (PROJECT)	PROJECT**	VI	3	2	PROJECT EVALU- ATION	**25+25=50
	TOTAL			66		825

*Computer practical

** 25 marks each for Internal and External evaluation

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4
INTERNAL	1

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT1 EXAM	50%	
COMPONENT 2 ASSIGNMENT/ SEMINAR	50%	

*Any two components, Attendance shall not be a component

PART A:
ECONOMICS/DEVELOPMENT ECONOMICS:
COMPLEMENTARY ELECTIVE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

SL NO.	COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS
1	1 C 01ECO/ DEV ECO	MATHEMATICS FOR ECONOMIC ANALYSIS I	I	6	4	3	40+10=50
2	2 C 02 ECO/ DEV ECO	MATHEMATICS FOR ECONOMIC ANALYSIS II	II	6	4	3	40+10=50
3	3 C03 ECO/ DEV ECO	MATHEMATICAL ECONOMICS I	III	6	4	3	40+10=50
4	4 C04 ECO/ DEV ECO	MATHEMATICAL ECONOMICS II	IV	6	4	3	40+10=50
5	1 C05 ECO	INTRODUCTORY ECONOMICS I (FOR NON-ECONOMICS PROGRAMMES ONLY)	I	6	4	3	40+10=50
6	2 C06 ECO	INTRODUCTORY ECONOMICS II (FOR NON-ECONOMICS PROGRAMMES ONLY)	II	6	4	3	40+10=50
7	3 C07 ECO	HISTORY OF ECONOMIC THOUGHT I	III	6	4	3	40+10=50
8	4 C08 ECO	HISTORY OF ECONOMIC THOUGHT II	IV	6	4	3	40+10=50
9	1 C 09ECO	POPULATION AND DEVELOPMENT	I	6	4	3	40+10=50
10	2 C10 ECO	ECONOMIC GEOGRAPHY	II	6	4	3	40+10=50
11	3 C11ECO	AGRICULTURAL ECONOMICS	III	6	4	3	40+10=50
12	4 C12 ECO	GENDER ECONOMICS	IV	6	4	3	40+10=50

ECONOMICS/DEVELOPMENT ECONOMICS:
LIST OF GENERIC ELECTIVE COURSES (ANY ONE OUT OF FIVE)
WORK AND CREDIT DISTRIBUTION

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HOURS	MARKS (EXT+INT)
5 D 01 ECO/ DEV ECO	BASICS OF ECONOMICS	V	2	2	2	20+5=25
5 D 02 ECO/ DEV ECO	DEVELOPMENT ISSUES OF INDIAN ECONOMY	V	2	2	2	20+5=25
5 D 03 ECO/ DEV ECO	KERELA ECONOMY	V	2	2	2	20+5=25
5 D 04 ECO/ DEV ECO	FUNDAMENTALS OF BUDGET	V	2	2	2	20+5=25
5 D 05 ECO/ DEV ECO	INDIAN ECONOMY IN THE POST-REFORM PERIOD	V	2	2	2	20+5=25



(Abstract)

M A Programme in English Language & Literature Programme under Credit Based Semester System in affiliated colleges – Revised Scheme, Syllabus and Pattern of Question Papers -Implemented with effect from 2016 admission- Orders issued.

ACADEMIC C SECTION

U.O.No.Acad/C3/13141/2014

Civil Station P.O, Dated,15 -07-2016.

- Read : 1. U.O.No.Acad/C1/11460/2013, dated, 12-03-2014, 05.12.2015 & 22.02.2016,
2. U.O of even No dated 20.10.2014
3. Meeting of the Board of Studies in English(PG) held on 06-05-2016,
4. Meeting of the Board of Studies in English(PG) held on 17-06-2016.
5. Letter dated 27.06.2016 from the Chairman, Board of Studies in English(PG)

ORDER

1. The Regulations for P.G Programmes under Credit Based Semester System were implemented in the University with effect from 2014 admission vide paper read (1) above dated 12.03.2014 & Certain modifications were effected to the same dated 05.12.2015 & 22.02.2016 respectively.

2. As per paper read (2) above, the Scheme, Syllabus & Pattern of question papers for M A Programme in English Language and Literature under Credit Based Semester System in affiliated Colleges were implemented in the University w.e.f. 2014 admission.

3. The meeting of the Board of Studies in English(PG) held on 06-05-2016, as per paper read (3) above, decided to revise the syllabus for M A Programme in English Language and Literature w.e.f. 2016 admission & as per paper read (4) above the Board of Studies finalized and recommended the scheme, syllabus and Pattern of question papers for M A Programme in English Language and Literature for implementation with effect from 2016 admission.

4. As per the paper read (5) above, the Chairman, Board of Studies in English (PG) has forwarded the finalized copy of the Scheme, Syllabus & Pattern of question Papers for M A Programme in English Language and Literature for implementation with effect from 2016 admission.

5. The Vice-Chancellor, after considering the matter in detail, and in exercise of the powers of the Academic Council, as per Section 11 (1) of Kannur University Act, 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised Scheme, Syllabus & Pattern of question Papers for M A Programme in English Language and Literature as recommended by the Board of Studies, under Credit Based Semester System in affiliated colleges with effect from 2016 admission.

6.Orders are therefore issued, implementing the revised Scheme , Syllabus & Pattern of Question Papers for M A Programme in English Language and Literature under Credit Based Semester System in affiliated Colleges with effect from 2016 admission, subject to report to the Academic Council.

7.The implemented Scheme, Syllabus & Pattern of Question Papers are appended here with.

Sd/-

JOINT REGISTRAR (ACADEMIC)

For Registrar

To:

The Principals of Affiliated Colleges Offering MA English Language and Literature Programme.

Copy to:

- 1.The Examination Branch
2. The Chairman, Board of Studies in English (PG)
3. PS to VC/PA to PVC/PA to Registrar/PA to CE.
4. JR/AR-I (Academic).
- 5.The Computer Programmer (with a request to upload the Website)
6. SF/DF/FC



Forwarded /By Order

SECTION OFFICER

A handwritten signature in black ink, appearing to be 'A. J. S.', written over the printed name 'SECTION OFFICER'.

- For more details log on to www.kannuruniversity.ac.in

APPENDIX TO U.O.NO.ACAD/C3/13141/2014 DATED 15.07.2016



KANNUR UNIVERSITY

M. A. PROGRAMME IN ENGLISH LANGUAGE AND LITERATURE

CREDIT BASED SEMESTER SYSTEM IN AFFILIATED COLLEGES

REVISED SCHEME & SYLLABUS

2016 ADMISSION ONWARDS

**M. A. PROGRAMME IN ENGLISH LANGUAGE AND
LITERATURE (CCSS)**

REVISED SYLLABUS – 2016 ADMISSION ONWARDS

(To be followed in the affiliated colleges under Kannur University)

SEMESTER 1—Four Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
I	ENG 1C01	British Literature: Chaucer to Seventeenth Century	20	80	100	4	5
	ENG 1C02	British Literature: Eighteenth Century	20	80	100	4	5
	ENG 1C03	Literary Criticism	20	80	100	4	5
	ENG 1C04	History and Structure of English Language	20	80	100	4	5
	ENG 1E01	Elective (Choose one among three) Malayalam Literature in Translation Media Studies English Language Teaching	20	80	100	4	5
	ENG 1E02						
	ENG 1E03						
TOTAL			100	400	500	20	25

SEMESTER 2—Three Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
II	ENG 2C05	Literature of the Romantic Period	20	80	100	4	7
	ENG 2C06	Literature of the Victorian Period	20	80	100	4	7
	ENG 2C07	Modern Literary Theory	20	80	100	4	6
	ENG 2E04	Elective (Choose one among three) Translation Studies World Drama Dalit Writings	20	80	100	4	5
	ENG 2E05						
	ENG 2E06						
TOTAL			80	320	400	16	25

SEMESTER 3—Four Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
III	ENG 3C 08	Twentieth Century British Literature	20	80	100	4	6
	ENG 3C09	Linguistics	20	80	100	4	4
	ENG 3C10	Indian Writing in English	20	80	100	4	5
	ENG 3C11	American Literature	20	80	100	4	6
	ENG 3E07 ENG 3E08 ENG 3E09	Elective (Choose one among three) Introduction to Cultural Studies European Fiction Introduction to Comparative Literature	20	80	100	4	4
	TOTAL		100	400	500	20	25

SEMESTER 4—Six Core Courses including Project Work and Viva-voce

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
IV	ENG 4C 12	Postcolonial Writings	20	80	100	4	6
	ENG 4C 13	Women's Writing	20	80	100	4	6
	ENG 4C 14	Film Studies	20	80	100	4	6
	ENG 4C 15	Comprehension	20	80	100	4	4
	ENG PR 16	Project	20	80	100	4	3
	ENG 4C 17	Viva-Voce	00	100	100	4	0
		TOTAL		100	500	600	24

Details of Marks, Credit and Hours

Internal Assessment	380 (Maximum 20 marks for a course. Test Paper: 5 Marks; Assignment: 5 Marks; Seminar/Viva: 5 Marks Attendance: 5 Marks) Comprehension Course Internal (20 marks oral test)
External Evaluation	1620
Total Marks	2000
Total Credits	80
Total Hours	25 per week


KANNUR UNIVERSITY
(Abstract)

(MCJ) Master of Communication and Journalism Programme - under Credit Based Semester System in Affiliated Colleges - Revised Scheme, Syllabus & Model Question Papers- Implemented with effect from 2016 Admission - Orders issued.

ACADEMIC C SECTION

U.O No. Acad/C1/10822/2014

Civil Station (PO), Dated, 11-07-2016

- Read: 1. U.O.No.Acad C1/11460/2013 dtd 12-03-2014
2. U.O.of even No dtd 29-08-2014
3. U.O.No.Acad C1/11460/2013 dated 05-12-2015 & 22-02-2016
4. Minutes of the meeting of the Board of Studies in Journalism & Mass Communication(Cd) held on 25-02-2016
5. U.O. of even No dtd 31-03-2016
6. Letter dated 27-06-2016 from the Chairman, Board of Studies in Journalism & Mass Communication(Cd)

ORDER

1. The Regulations for Credit Based Semester System for P.G. Programmes in affiliated Colleges were implemented in the University with effect from 2014 admission vide paper read (1) above and certain modifications were effected to the same vide paper read (3) above.

2. As per the paper read (2) above, the Scheme, Syllabus & Model Question papers for Master of Communication and Journalism (MCJ) Programme were implemented in the University under Credit Based Semester System w.e.f. 2014 admission.

3. As certain anomalies were reported in the existing MCJ Syllabus implemented w.e.f 2014 admission and since the question paper setting of 2014 admission 3rd Sem and 2015 admission 1st Semester was over, the BOS vide paper read (4) above, decided to follow the existing Syllabus for 2014 & 2015 admission and the above decision of the board was implemented vide paper read (5) above. The Board of Studies also decided to revise the Syllabus w.e.f 2016 admission in the light of decision of the meeting and approved the restructured Syllabus by correcting the anomalies to be implemented w.e.f.2016 admission.

4. The Chairman Board of Studies in Journalism & Mass Communication (Cd) vide paper read (6) above has forwarded the revised Scheme, Syllabus and Model Question paper for Master of Communication and Journalism (MCJ) Programme for implementation with effect from 2016 admission.

5. The Vice Chancellor after considering the matter in detail, and in exercise of the powers of the Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement the revised Scheme, Syllabus and Model Question papers as recommended by the Board of Studies in Journalism and Mass Communication (Cd) under Credit Based Semester System in affiliated Colleges with effect from 2016 admission, subject to report to the Academic Council.

6. Orders are, therefore, issued accordingly.

7. The revised Scheme, Syllabus and Model Question Papers w.e.f 2016 admission are appended.

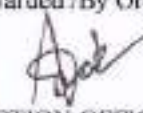
Sd/-
JOINT REGISTRAR (ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering MCJ Programmes

Copy to:

1. The Examination Branch (through PA to CE).
2. The Chairman BOS in Mass Communication & Journalism (Cd)
3. SF/DF/FC.

Forwarded /By Order


SECTION OFFICER

For more details: log on www.kannur-university.ac.in



KANNUR  **UNIVERSITY**

**REVISED SCHEME AND SYLLABUS FOR
PG PROGRAMME IN**

**Master of Communication and Journalism
(MCJ)**

UNDER CREDIT BASED SEMESTER SYSTEM

KU CBSS-PG-2014

FOR

AFFILIATED COLLEGES UNDER KANNUR UNIVERSITY

From 2016 ADMISSION onwards

Prepared and offered by: *Board of Studies of Journalism
and Mass Communication, Kannur University*

MCJ Programme SYLLABUS for Affiliated Colleges in Kannur University w.e.f 2016

Master of Communication and Journalism

The syllabi of MCJ programme offered in the affiliated colleges of the university under semester system have been revised in the light of the decision of the meeting of the Board of studies, Journalism and Mass Communication held on 25/02/2016. The revised syllabi shall apply to MCJ programmes conducted by the affiliated colleges of Kannur university with effect from the academic year 2016-17 (2016 admission onwards) and regulations of PG Programme of Kannur University (KUCBSS –PG-2014) - U.O. No: Acad/C1/11460/2013 Dated 12/03/2014 and the revised order No.Acad/C1/11460/2013 Dated 05/12/2015 and 22.02.2016 shall be applicable to the MCJ Programme implemented w.e.f. 2016 admission.

I. Programme structure:

I Semester -from June to October

No	Core / Elective	Course Code	Title of the Course	Hours allotted per week	Credits	Marks		
						CA	ESE	Total
1	Core	MCJ 1C 01	Introduction to Mass Communication	06	04	15	60	75
2	Core	MCJ 1C 02	Reporting for Newspapers	06	04	15	60	75
3	Core	MCJ 1C 03	Editing for Newspapers	06	04	15	60	75
4	Core	MCJ 1C 04	Television Production	07	04	15	60	75
Total				25	16	60	240	300

II Semester -from November to March

No	Core / Elective	Course Code	Title of the Course	Hours allotted per week	Credits	Marks		
						CA	ESE	Total
1	Core	MCJ 2C 05	Media Laws and Ethics	04	04	15	60	75
2	Core	MCJ 2C 06	Magazine Journalism	04	04	15	60	75
3	Core	M CJ 2C 07	Communication Theories	04	04	15	60	75
4	Core	MCJ 2C 08	Radio Production	04	04	15	60	75
5	Elective**	MCJ 2E 01	Photo Journalism	04	04	15	60	75
6	Elective**	MCJ 2E 02	Travel Journalism					
7	Elective**	MCJ 2E 03	Health Communication					
8	Practical – I	MCJ 2 P 01	Newspaper production , Video production, Magazine production and Radio production	05	02	10 (2.5+2.5+2.5+2.5)	40 (10+10+10+10)	50
Total				25	22	85	340	425

**** Select one elective from this group**

III Semester -from June to October

No	Core / Elective	Course Code	Title of the Course	Hours allotted per week	Credits	Marks		
						CA	ESE	Total
1	Core	MCJ 3C 09	Public Relations and Corporate Communication	05	04	15	60	75
2	Core	MCJ 3C 10	Advertising	05	04	15	60	75
3	Core	MCJ 3C 11	Mass communication Research	05	04	15	60	75
4	Core	MCJ 3C 12	Television Journalism	05	04	15	60	75
5	Elective**	MCJ 3E 04	Indian Politics and Communication	05	04	15	60	75
6	Elective**	MCJ 3E 05	Agricultural Journalism					
7	Elective**	MCJ 3E 06	Business Journalism					
8	Elective**	MCJ 3E 07	Development Communication					
Total				25	20	75	300	375

**** Select one elective from this group**

IV Semester- from November to March

No	Core / Elective	Course Code	Title of the Course	Hours allotted per week	Credits	Marks		
						CA	ESE	Total
1	Core	MCJ 4C 13	Introduction to Cinema	05	04	15	60	75
2	Core	MCJ 4C 14	New Media and Online Journalism	05	04	15	60	75
3	Elective**	MCJ 4E 08	Technical Writing	05	04	15	60	75
4	Elective**	MCJ 4E 09	Fashion Communication					
5	Elective**	MCJ 4E 10	Sports Journalism					
6	Practical – II	MCJ 4P 02	PSA production, TV News bulletin production and Short film production	05	02	10 (2.5+2.5+5)	40 (10+10+20)	50
7	Project	MCJ 4Pr	Dissertation	05	03	10	40	50
			Internship*	-	02	25	-	25
8	Viva Voce	MCJ 4 C 15	Viva Voce	--	03		50	50
Total				25	22	90	310	400

**** Select one elective from this group**

***Marks for internship should be allotted by the HOD**

- a. Total marks for semester – I -300
- b. Total marks for semester – II- 425
- c. Total marks for semester – III- 375
- d. Total marks for semester – IV- 400
- e. Total marks for semester I to IV- 1500

II. Practicals

Practical –I

MCJ 2 P 01 Newspaper production, Video production, Magazine production and Radio production.

1. Lab Newspapers: 5 Marks

Each student shall submit five single-page printed A3-size lab-newspapers either in Malayalam or in English, prepared as part of reporting assignments within the semester, to be evaluated by external examiners.

2. Newspaper Front Page: 5 Marks

Each student shall edit and design the front page of an A3-size newspaper either in Malayalam or in English, with the stories given by the external examiners.

3. Video production: 10 Marks

Students, divided into teams of four members each, shall produce a video of their choice without dialogue limited to five minutes, during the semester and submit it for external valuation.

4. Magazine production: 10 Marks

Students shall be divided into teams of five members each, to bring out a printed multi-color 32-page-magazine either in Malayalam or in English, reported, subbed and designed by them during the semester. It shall be submitted for external valuation.

5. Radio production: 10 Marks

Each student shall produce a seven minutes radio feature / documentary on a topic and submit it for external valuation.

Practical –II

MCJ 4P 02 PSA production, TV News bulletin production and Short film production

1. PSA production: 10 Marks

Each student shall produce a Public Service Advertisement (PSA) in print/ audio/ visual format and submit it for external valuation.

2. TV News bulletin production: 10 Marks

Students either in groups of 4-5 or individually shall report, edit and present a news bulletin either in Malayalam or in English and submit it for external valuation. The duration of a solo news bulletin shall be seven minutes while for group productions it will be 25 minutes.

3. Short film production: 20 Marks

Students divided into teams of four or five members each shall produce either a documentary or a short film of 15-minutes, in Malayalam or English, within the semester and submit it for external valuation.

III. Dissertation:

In the fourth semester each student shall submit a dissertation on any topic of his/her interest. The dissertation aims at introducing the students with research methodology and to prepare them for doing further research .Students are required to do a dissertation on a topic relating to an area of study chosen in consultation with the faculty. Each student shall be guided in his/her project by a member of the faculty.

IV. VIVA:

A Viva Voce examination will be conducted at the end of IV semester covering the whole programme including the project.



KANNUR UNIVERSITY

M.Com. Programme under Credit Based Semester System in affiliated Colleges- Revised Scheme, Syllabus & Model Question Papers- Implemented with effect from 2014 admission- Orders issued.

ACADEMIC BRANCH

U.O.No.Acad/C1/6898 /2014

Dated, Civil Station, P.O. 8-7-2014

- Read: 1. U.O.No.Acad C1/11460/2013 dated 12-03-2014.
2. Minutes of the meeting of the Board of Studies in Commerce (PG) held on 10-12-2013
3. Minutes of the meeting of the Faculty of Commerce and Management Studies held on 28-03-2014
4. Letter dated 3-06-2014 from the Chairman, Board of Studies in Commerce (PG)

ORDER

1. As per the paper read (1) above, the Revised Regulations for P.G. Programmes under Credit Based Semester System (CBSS) have been implemented in this University w.e.f 2014 admission.
2. The Board of Studies in Commerce PG vide paper read (2) above, finalized the Scheme Syllabus and Model Question Papers for M.Com Programme under Credit Based Semester System with effect from 2014 admission.
3. As per the paper read (3) above the meeting of Faculty of Commerce and Management Studies approved the Scheme, Syllabus and Model question papers for M.Com Programme w.e.f.2014 admission.
4. The Chairman, Board of Studies in Commerce (PG) as per letter cited (4) has forwarded the Scheme, Syllabus and Model Question Papers for M.Com. Programme for implementation with effect from 2014 admission.
5. The Vice Chancellor after considering the matter in detail and in exercise of the powers of Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement Scheme, Syllabus and Model Question Papers for M.Com Programmes under Credit Based Semester System (CBSS) with effect from 2014 admission subject to report Academic Council.
6. Orders are, therefore, issued accordingly.
7. The Implemented Scheme, Syllabus and Model Question Papers are appended.

Sd/-

DEPUTY REGISTRAR(Academic)
FOR REGISTRAR

To
The Principals of Colleges offering M.Com Programme

(PTO)

Copy To:

1. The Examination Branch (through PA to CE)
2. PS to VC
3. PA to Registrar
4. PA to CE
5. PA to EO
6. DR (Acad)
7. AR I (Acad)
8. Chairman, BOS in ^{Commerce} ~~History~~ (PG)
9. SF/DE/FC



Approved for Issue


Section Officer

*For more details; log on www.kannuruniversity.ac.in

-1-

KANNUR UNIVERSITY

U.O.No.Acad/C1/6898/2014 Dated, 8-07-2014

SYLLABUS FOR THE POST GRADUATE DEGREE PROGRAMME IN COMMERCE
(M.Com) UNDER CREDIT BASED SEMESTER SYSTEM (CBSS-PG) FOR
AFFILIATED COLLEGES IMPLEMENTED WITH EFFECT
FROM 2014-15 ACADEMIC YEAR

**Submitted to
THE KANNUR UNIVERSITY**

PG BOARD OF STUDIES COMMERCE

COURSES FOR M.COM

Semester	Course Code	Title	Marks			Credit
			Internal	External	Total	
I	COM1C01	Business Environment & Policy	15	60	75	4
	COM1C02	Quantitative Techniques & Operation Research	15	60	75	4
	COM1C03	Management Information System	15	60	75	4
	COM1C04	Organizational Behaviour	15	60	75	4
	COM1C05	Accounting for Business Decisions	15	60	75	4
	Total		75	300	375	20
II	COM2C06	Strategic Management	15	60	75	4
	COM2C07	Research Methodology & Computer Application	15	60	75	4
	COM2C08	Costing for Management Decisions	15	60	75	4
	COM2C09	Advanced Business Accounting	15	60	75	4
	COM2C10	Financial Management	15	60	75	4
	Total		75	300	375	20
III	COM3C11	Marketing Management	15	60	75	4
	COM3C12	Corporate Accounting	15	60	75	4
	COM3C13	Income Tax Law & Practice	15	60	75	4
	COM3C14	Wealth Tax & Indirect Taxes	15	60	75	4
	COM3C15	Human Resource Management	15	60	75	4
	Total		75	300	375	20
Elective A. Finance	COM4E01	Security Analysis & Portfolio Management	15	60	75	4
IV	COM4E02	International Financial Management	15	60	75	4
	COM4E03	Financial Markets & Services	15	60	75	4
	COM4E04	Corporate Tax Planning & Management	15	60	75	4
	COM4Pr	Project Report/Dissertation			25	2
	COM4C16	Viva-Voce			50	2
	Total		60	240	375	20
Grand Total					1500	80

(Continued in Page-2)

Elective B. Marketing	COM4E05	Consumer Behavior	15	60	75	4
IV	COM4E06	Advertising & Sales Management	15	60	75	4
	COM4E07	Services Marketing	15	60	75	4
	COM4E08	Logistics Management	15	60	75	4

Elective C. International Business	COM4E09	International Business Environment	15	60	75	4
IV	COM4E10	Foreign Trade Management	15	60	75	4
	COM4E11	International Banking	15	60	75	4
	COM4E12	International Marketing	15	60	75	4

KANNUR  UNIVERSITY

(Abstract)

M.Sc Computer Science Programme – Scheme, Syllabus and Model Question Papers – Core / Elective Courses under – Credit Based Semester System – Affiliated Colleges - Implemented with effect from 2014 admission - Orders issued.

ACADEMIC BRANCH

U.O.No.Acad/C4/12581/2014

Dated: Civil Station P.O, 20-10-2014

- Read:-
1. U.O.No.Acad.C1/11460/2013 dated 12-03-2014.
 - 2.Minutes of the meeting of the Board of Studies in Computer Science PG held on 16/07/2014.
 - 3.Minutes of the meeting of the Faculty of Technology held on 01/04/2014.
 - 4.Letter dated 29/09/2014 from Dr. Raju Chairman, Board of Studies in Computer Science (PG)

ORDER

1.Revised Regulations for Credit Based Semester System for PG Programmes in affiliated Colleges have been implemented in this University with effect from 2014 admission vide paper read (1) above.

2.The Board of Studeis in Computer Science (PG) vide paper read (2) above, has finalized the Scheme, Syllabus and Model Question papers for M.Sc Computer Science under Credit Based Semester System with effect from 2014 admission.

3. As per paper read (3) above, the meeting of Faculty of Technology, approved the Scheme, Syllabus and Model Question papers for M.Sc Computer Science with effect from 2014 admission.

4.The Chairman, Board of Studies in Computer Science (PG) vide paper (4) above, has forwarded the Scheme, Syllabus and Model Question papers for M.Sc Computer Science for implementation with effect from 2014 admission.

5.The Vice Chancellor, after considering the matter in detail, and in exercise of the power of the Academic Council, conferred under Section 11 (1) of Kannur University Act, 1996 and all other enabling provisions read together with, has accorded sanction to implement the Scheme, Syllabus and Model Question Papers (Core/Elective Courses) for M.Sc Computer Science Programme in affiliated Colleges Under Credit Based Semester System with effect from 2014 admission subject to report Academic Council.

6. Orders are, therefore issued accordingly.

7. The implemented Scheme, Syllabus and Model Question Papers are appended.

Sd/-

DEPUTY REGISTRAR (Acad)
For REGISTRAR

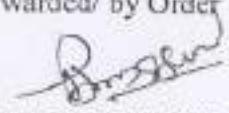
To

The Colleges offering M.Sc Computer Science Programme.

Copy to:

- 1.The Examination Branch Through (PA to CE)
- 2.The Chairman, Board of Studies in Computer Science (PG)
- 3.PS to VC/PA to R/PA to CE
- 4.DR/AR-1 Academic

Forwarded/ by Order


SECTION OFFICER



KANNUR UNIVERSITY

M Sc COMPUTER SCIENCE

(Credit Based Semester System)

Regulations, Curricula, Syllabus and Scheme of Evaluation

(With Effect from 2014 admission)

REGULATIONS

1. Duration of the M. Sc. (Computer Science) programme shall be 2 years, divided into 4 semesters. Each semester shall have 90 working days. The maximum period of completion is eight semesters (4 years).

2. Eligibility for admission: As announced by the University from time to time.

3. Programme Structure

3.1 Attendance: The minimum attendance required for each course shall be 75% of the total number of classes conducted for that semester. Those who secure the minimum attendance in a semester alone will be allowed to register for the End Semester Examination. Condonation of shortage of attendance may be granted as per Kannur University PG regulation.

3.2 Credits: The total minimum credits, required to complete M. Sc. Computer Science programme is 80 in which minimum credits required for core (including practical and project) courses is 60 and for Elective courses is 12.

3.3 Theory and Practical courses

The evaluation scheme for each Theory and Practical courses except MCS3C16 Research Methodology shall contain two parts; (a) Continuous Assessment (CA) and (b) End Semester Evaluation (ESE). 20% marks shall be given to CA and the remaining 80 % to ESE. For MCS3C16 Research methodology the evaluation is 100% internal and shall follow the distribution applicable to theory CA.

CONTINUOUS ASSESSMENT (CA)

Theory : The components of theory evaluation are as follows:

	COMPONENTS	% OF MARKS
i	Test papers	40%
ii	Assignment	20%
iii	Case Study / Seminar / Viva	20%
iv	Attendance	20%

- i. *Test Papers*: There shall be a minimum of two test papers to be conducted for each course. If more than two test papers are conducted, then two best scores shall be taken for the award of IA marks. The dates of test papers shall be announced well in advance and the marks should be displayed in the notice board.
- ii. *Assignments*: One or more assignments (including practical assignments) shall be given for each course. The mode of assessment of the assignments shall be decided by the faculty concerned with due approval from the department council and shall be declared at the beginning of the semester. (It is suggested that to the extent possible, give individual assignments and also conduct short viva based on the assignment submitted).
- iii. *Case study / Seminar / viva*: The faculty with due approval from the department council shall choose one or more from this category, depending on the nature of subject and the mode of assessment is to be declared at the commencement of the semester. For seminar, topics outside but related to the syllabus shall be chosen.
- iv. *Attendance* :

Attendance	% of Marks for attendance
>=90	100
85 to 89	80
80 to 84	60
76 to 79	40
75	20

Practical :The Components of CA for practical courses except Case study I and II are as follows:

	COMPONENTS	% OF MARKS
i	Lab Test (Minimum one)	20%
ii	Completion of the list of Lab assignments prescribed by the faculty	20%
iii	Periodical assessment of Lab assignments through execution of programs and viva	40%
iv	Attendance (Mark distribution is same as that of theory)	20%

For Case study I and II :

	COMPONENTS	% OF MARKS
i	Periodical viva / short quizzes / short programming assignments to evaluate the basic knowledge/understanding of the tool.	30%
ii	Coding – Logic, Selection of appropriate constructs / features of the Tool, Style etc.	30%
iii	Execution of the case study - output	20%
iv	Viva based on case study	20%

Note :All the records in respect of Continuous Assessment (CA) must be kept in the department and must be made available for verification by university. The results of the CA shall be displayed on the notice board within 5 working days from the last day of a semester. It should be get signed by the candidates. The marks awarded for various components of the CA shall not be rounded

off, if it has a decimal part. The total marks of the CA shall be rounded off to the nearest whole number.

END SEMESTER EVALUATION (ESE):

There shall be double valuation system of answer books. The average of two valuations shall be taken in to account. If there is a variation of more than 10% of the maximum marks, the answer books shall be valued by a third examiner. The final marks to be awarded shall be the average of the nearest two out of three awarded by the examiners. After that there shall be no provision for revaluation

Pattern of questions: Questions shall be set to assess knowledge acquired, standard application of knowledge, application of knowledge in new situations, critical evaluation of knowledge and the ability to synthesize knowledge. Question paper for end semester theory examination shall consist of:

- i. Short answer type : 12 questions of which 10 to be answered. $10 \times 3 = 30$ marks,
- ii. Essay type: 5 questions (one either –or question from each module) $\times 10$ marks = 50 marks

End Semester Evaluation in Practical courses shall be conducted and evaluated by two examiners- one internal and one external. Details of scheme of evaluation of ESE practical courses are given along with respective syllabus.

3.4 Project: A project work has to be undertaken by all students. The project can be software development following all or some of the software development lifecycle or an R&D project. The hours allotted for project work may be clustered into a single slot so that students can do their work at a centre or location for a continuous period of time. The Major project work should be carried out in the Department /Institution or in a level Industry / R & D organization of national repute. Project work shall be carried out under the supervision of a Teacher. If the project is carried out in an Industry / R & D organization outside the campus, then a co-guide shall be selected from the concerned organization. If the project work is of interdisciplinary in nature, a co-guide shall be taken from the other department concerned. Every student should do the Project individually and no grouping is allowed. All the candidates are required to get the approval of their synopsis and the guide before commencement of the project from the Department. A co-guide should be a postgraduate in CS or allied subject or a person of eminence in the area in which student has chosen the project. At the end of the semester the candidate shall submit the Project report (two bound copies and one soft copy) duly approved by the guide and co-guide for End Semester Evaluation. The project report shall be prepared according to the guidelines approved by the University.

Evaluation of Project:

- i. A Departmental committee duly constituted by the Head of the Department will review the project periodically.
- ii. **Continuous Assessment of project work:** There shall be three internal presentations before the committee (Minimum two members, including the guide). The assessment is based on presentation, interim report and viva voce. The total mark for CA shall be divided among the three presentations in the ratio 20%:30%:50%. Each internal presentation shall be evaluated based on the following components:

Component	% of marks
Understanding of the problem / concepts	25
Adhering to methodology.	20
Quality of presentation and demonstration (Demonstration is optional)	15
Quantum of work / effort	30
Organization and content of mid-term report	10

- iii. End Semester Assessment of Project:** A board of two examiners appointed by the University shall conduct ESE evaluation. The evaluation shall be based on the report, presentation of the work, demonstration of the work (optional) and a detailed viva voce based on the work carried out. A candidate will not be permitted to attend the Project evaluation without duly certified project reports. Also a project will be evaluated only if the candidate attend the ESE presentation and Viva voce on the scheduled date and time. A board shall evaluate a maximum of 10 candidates in a day. The ESE evaluation shall consist of the following components:

Component	% of marks
Understanding of the problem/requirements/ concepts related to the project	15
Adhering to methodology (Software engineering phases or research methodology) and the candidates understanding of the components of methodology	15
Quality of Modeling of the problem and solution/ database design / form design / reports / testing (For research projects - relevance /novelty of the work(s)/ use of data/ proposal of new models /analysis of algorithms/ comparison and analysis of results /findings)	20
Quality of presentation / demonstration	15
Quantum of work / effort - assessed through the content of report, presentation and viva.	25
Organization and content of report	10

- iv.** A student shall be declared to pass in the Project report course if she/he secures minimum 40 % marks of the aggregate and 40% separately for external.
- v.** If a candidate fail in the evaluation of Project, he/she has to repeat the project course along with the next batch and undergo both CA and ESE. *Unlike theory/practical courses, the CA mark will not retained.*
- vi.** There shall be no improvement chance for the marks obtained in the Project course.

3.5 Seminar: Each student shall select a relevant topic, prepare a seminar report and give a presentation (30 to 45 minutes), under the guidance of a faculty member. The evaluation of seminar

is 100% internal and components and mode of evaluation shall be formulated by the department council (May include components like content, Presentation, interaction and structure of report).

3.6 VIVA VOCE: A general Viva Voce covering all courses in the Programme shall be conducted in the fourth semester. The Viva voce shall be conducted by two external examiners. The Viva voce *shall not be clubbed* with the project evaluation. The details of the mode of conduct and evaluation of Viva Voce shall be decided by the BOE.

4. GRADING SYSTEM

Seven Point Indirect Relative grading system:

Evaluation(both internal and external) is carried out using Mark system .The grading on the basis of a total internal and external marks will be indicated for each course and for each semester and for the entire programme.

The guidelines of grading is as follows-

% of Marks (CA+ESE)	Grade	Interpretation	Range of grade points	Class
90 and above	O	Outstanding	9-10	First class with Distinction
80 to below 90	A	Excellent	8-8.9	
70 to below 80	B	Very good	7-7.9	First class
60 to below 70	C	Good	6-6.9	
50 To below 60	D	Satisfactory	5-5.9	Second class
40 to below 50	E	Pass/Adequate	4-4.9	Pass
Below 40	F	Failure	0-3.9	Fail

$$\text{S.G.P.A} = \frac{\text{SUM OF CREDIT POINTS OF ALL COURSES IN THE SEMESTER}}{\text{TOTAL CREDITS IN THAT SEMESTER}}$$

$$\text{CREDIT POINT} = \text{GRADE POINT (G)} \times \text{CREDIT (C)}$$

$$\text{C.G.P.A} = \frac{\text{Sum of credit points of all completed semesters}}{\text{Total credits acquired}}$$

$$\text{OGPA} = \frac{\text{Sum of credit points obtained in four semesters}}{\text{Total credits (80)}}$$

PASS REQUIREMENT:

COURSE:

A CANDIDATE SECURING E GRADE WITH 40% OF AGGREGATE MARKS AND 40% SEPARATELY FOR ESE FOR EACH COURSE SHALL BE DECLARED TO HAVE PASSED IN THAT COURSE.

SEMESTER

Those who secure not less than 40 % marks (both ESE and CA put together) for all the courses of a semester shall be declared to have successfully completed the semester.

The marks obtained by the candidates for CA in the first appearance shall be retained (irrespective of pass or fail)

The candidates who fail in theory unit shall reappear for theory unit only, and the marks secured by them in practical unit, if passed in practical, will be retained.

A candidate who fails to secure a minimum for a pass in a course will be permitted to write the same examination along with the next batch.

For the successful completion of a semester, a candidate should pass all courses and secure a minimum SGPA of 4. However a student is permitted to move to the next semester irrespective of his/her SGPA. A student will be permitted to secure a minimum SGPA of 4.00 required for the successful completion of a Semester or to improve his results at ESE of any semester, by reappearing for the ESE of any course of the semester concerned, along with the examinations conducted for the subsequent admission

IMPROVEMENT:

A candidate who secures minimum marks (40 %) for a pass in a course will be permitted to write the same examination along with the next batch if he/she

desires to improve his/her performance in ESE. If the candidate fails to appear for the improvement examination after registration, or if there is no change/up gradation in the marks after availing the improvement chance, the marks obtained in the first appearance shall be retained. There shall be no improvement chance for the marks obtained in internal assessment. Improvement of a particular semester can be done only once. The student shall avail the improvement chance in the succeeding year along with the subsequent batch.

There will be no supplementary examinations. For re-appearance/ improvement student can appear along with the next batch.

KANNUR UNIVERSITY
M Sc COMPUTER SCIENCE
Course Structure and Scheme of Evaluation (From 2014 Admission)
(CBSS- For affiliated Colleges)

CREDIT DISTRIBUTION

Semester	Core	Elective	Practical	Project	Total
1	17	0	3	0	20
2	16	0	5	0	21
3	13	3	5	0	21
4	2	9	0	7	18
Total	48	12	13	7	80

COURSE STRUCTURE

SEMESTER 1

Course Code	Course title	Instructional Hrs/week			MARKS			Credit
		L	P	T	CA	ESA	TOTAL	
MCS1C01	Discrete Mathematics	3	0	1	20	80	100	3
MCS1C02	Computer Organization and Architecture	3	0	1	20	80	100	3
MCS1C03	Digital Systems and Microprocessors	4	0	0	20	80	100	4
MCS1C04	Operating Systems	3	0	1	20	80	100	3
MCS1C05	Introduction to Programming	4	0	0	20	80	100	4
MCS1P01	Lab – I (IP/OS)	0	8	2	20	80	100	3
Total		17	8	5	120	480	600	20

SEMESTER 2

Course Code	Course title	Instructional Hrs/week			MARKS			Credit
		L	P	T	CA	ESA	TOTAL	
MCS2C06	Java Programming	3	0	0	20	80	100	3
MCS2C07	Data Structures& Algorithms	3	0	0	20	80	100	3
MCS2C08	Database Management Systems	3	0	0	20	80	100	3
MCS2C09	Computer Networks	3	0	0	20	80	100	3
MCS2C10	Formal Languages and Finite Automata	3	0	0	20	80	100	3
MCS2P02	Lab – II (Java/DS/DBMS)	0	7	1	20	80	100	3
MCS2P03	Case Study I	0	3	2	10	40	50	2
MCS2C11	Seminar	0	0	2	50	0	50	1
Total		15	10	5	180	520	700	21

SEMESTER 3

Course Code	Course title	Instructional Hrs/week			MARKS			Credit	
		L	P	T	CA	ESA	TOTAL		
MCS3C12	Computer Graphics	3	0	0	20	80	100	3	
MCS3C13	System Programming & Compiler Design	3	0	0	20	80	100	3	
MCS3C14	System Administration and Network Programming	3	0	0	20	80	100	3	
MCS3C15	Software Engineering	3	0	0	20	80	100	3	
MCS3C16	Research methodology	1	0	1	50	0	50	1	
ELECTIVE I	MCS3E01	Digital Signal Processing	3	0	0	20	80	100	3
	MCS3E02	Probability and Statistics							
	MCS3E03	Fuzzy Systems							
	MCS3E04	Design and Analysis of Algorithms							
	MCS3E05	Information Security							
MCS3P04	Lab – III (CG /NP&A/SP&CD)	0	6	2	20	80	100	3	
MCS3P05	Case study II	0	3	2	10	40	50	2	
Total		16	9	5	180	520	700	21	

SEMESTER 4

Course Code	Course title	Instructional Hrs/week			MARKS			Credit	
		L	P	T	CA	ESA	TOTAL		
ELECTIVE 2	MCS4E06	Digital Image Processing	3	0	0	20	80	100	3
	MCS4E07	Digital Speech Processing							
	MCS4E08	Operations Research							
	MCS4E09	Linux Kernel							
	MCS4E10	Simulation and Modeling							
ELECTIVE 3	MCS4E11	Mobile Computing	3	0	0	20	80	100	3
	MCS4E12	Pattern Recognition							
	MCS4E13	Artificial Neural Networks							
	MCS4E14	High Performance Computing							
	MCS4E15	Visual Cryptography							
ELECTIVE 4	MCS4E16	Linux Device Drivers	3	0	0	20	80	100	3
	MCS4E17	Data Mining							
	MCS4E18	Natural Language Processing							
	MCS4E19	Cyber Forensic							
	MCS4E20	Artificial Intelligence							
MCS3Pr04	Project	0	16	5	20	80	100	7	
MCS4C17	General Viva Voce	-	-	-	-	100	100	2	
Total		9	16	5	80	420	500	18	



Dr. DOMINIC THOMAS
Principal
S.E.S. COLLEGE
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Criterion 1 – Curricular Aspects

Key Indicator- 1.2 Academic Flexibility

1.2.1 Percentage of Programmes in which Choice Based Credit System (CBCS)/ elective course system has been implemented.



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KANNUR UNIVERSITY
(Abstract)

BA English (Language & Literature) Programme under Choice Based Credit and Semester System - Revised Scheme , Syllabi & Pattern of question papers for Core/Open Courses - Implemented w.e.f 2014 Admission - Orders issued.

ACADEMIC BRANCH

U.O.No.Acad/C3/3951/2014(1)

Dated, Civil Station.P.O, 03-05-2014

Read:1.U.O No.Acad/C2/2232/2014 , dated 14.3.2014

2.Minutes of the meeting of the Board of Studies in English (UG) held on 18.03.2014

3.Minutes of the meeting of Faculty of Language & Literature held on 26-3-2014

4. Letter dated 05.04.2014 from the Chairman, Board of Studies in English (UG)

ORDER

1.Revised Regulations for U.G Programmes under Choice Based Credit and Semester System were implemented in the University with effect from 2014 admission, as per paper read (1) above.

2. As per paper read (2) above, the scheme, syllabus and pattern of question papers for core/open courses in B.A English Language & Literature programme were finalized and recommended for implementation by the Board of Studies in English (U.G).

3.As per paper read (3) above, the meeting of Faculty of Language & Literature, held on 26.3.2014 has approved the scheme, syllabus and pattern of question papers for B.A English (Language & Literature) Programme to be implemented with effect from 2014 admission.

4. As per the paper read (4) above, the Chairman, Board of Studies in English (UG) has forwarded the finalized copy of the Scheme , Syllabi & Pattern of question Papers for Core/Open Courses of B.A English (Language & Literature) Programme for implementation with effect from 2014 admission.

5.The Vice-Chancellor, after considering the matter in detail, and in exercise of the powers of the Academic Council, as per Section 11 (1) of Kannur University Act, 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised Scheme , Syllabi & Pattern of question Papers for Core/Open Courses of B.A English(Language & Literature) Programme under Choice Based Credit and Semester System with effect from 2014 admission.

6. Orders are therefore issued implementing the revised Scheme , Syllabi & Pattern of Question Papers for Core/Open Courses of B.A English (Language & Literature) Programme under Choice Based Credit and Semester System with effect from 2014 admission, subject to report to the Academic Council.

7. The implemented Scheme, Syllabi & Pattern of Question Papers are appended.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)

For Registrar


To:

The Principals of Affiliated Colleges

Copy to:

1. The Examination Branch
2. The Chairman, Board of Studies in English (UG)
3. PS to VC/PA to PVC/PA to Registrar/PA to CE
4. DR/AR-I (Academic).
5. SF/DF/FC

Forwarded /By Order/


SECTION OFFICER

- For more details log on to www.kannuruniversity.ac.in

KANNUR UNIVERSITY



NEW CURRICULUM FOR UG PROGRAMME IN ENGLISH LANGUAGE AND LITERATURE

UNDERGRADUATE BOARD OF STUDIES IN ENGLISH

SYLLABI FOR CORE COURSES IN ENGLISH LANGUAGE AND LITERATURE(2014
ADMISSION ONWARDS)

English Core Courses

General Objectives

English Literature is a product of historical circumstances. There is a complex interaction between literature and its contexts. Literature functions as a critical reflection on people and society in history and on the ways in which people make historical sense of their lives. It is the aim of the course to expand the relation between texts and contexts, and provide a firm foundation for historically contextualized literary study. In the general organization of texts and modules the Board of Studies has been guided by a pragmatic sense of the general requirements of undergraduate studies in English and the kinds of literary traditions, periods and texts that are widely taught and studied in universities and colleges around the world.

Duration: Six semesters of six months each

Scheme:

The Programme comprises of sixteen Courses of which fifteen are Core Courses, including Project and the remaining one is an Elective. In addition, there is an Open Course. The distribution is as follows:

Semester 1: One Core Course, one Complementary Course and three Common Courses

Semester 2: One Core Course, one Complementary Course and three Common Courses

Semester 3: Two Core Courses, one Complementary Course and two Common Courses

Semester 4: Two Core Courses, one Complementary Course and two Common Courses

Semester 5: Four Core Courses, one Open Course

Semester 6: Six Core Courses including an Elective and a Project

Each Course (excluding Open Course and Project) carries 50 marks each (External 40, Internal 10)

Project carries 25 marks (External 20, Internal 5)

Open Course carries 25 marks (External 20, Internal 5)

Total marks for Core, Complementary and Open Courses will be 1000

(Total marks for the entire Programme including Common Courses will be 1500)

1. Table of Core Course

No	Course Code	Title of Course	Hours/Week	Credit	Semester
1	1B01ENG	History of English Language and Literature	6	4	1
2	2B02ENG	Studies in Prose	6	4	2
3	3B03ENG	Linguistics	5	4	3
4	3B04ENG	English in the Internet Era	4	4	3
5	4B05ENG	Studies in Poetry	4	4	4
6	4B06ENG	Literary Criticism	5	5	4
7	5B07ENG	Modern Critical Theory	5	5	5
8	5B08ENG	Drama: Theory and Literature	5	4	5
9	5B09ENG	Studies in Fiction	5	4	5
10	5B10ENG	Women's Writing	5	4	5
11	5B11ENG	Project	3	2	5
12	6B12ENG	Malayalam Literature in Translation	5	4	6
13	6B13ENG	New Literatures in English	5	4	6
14	6B14ENG	Indian Writing in English	5	4	6
15	6B15ENG	Film Studies	5	4	6
16	6B16ENG	Elective 01, 02, 03	5	4	6

2. Table of Electives

No	Course Code	Title of Course	Hours/Week	Credit	Semester
1	6B16(1)ENG	World Literature in Translation	5	4	6
2	6B16(2)ENG	Indian Writing in Translation	5	4	6
3	6B16(3)ENG	Writing for Media	5	4	6

3. Open Course

No	Course Code	Title of Course	Hours/Week	Credit	Semester
1	5D01(1)ENG	English for Competitive Examination	2	2	5

Distribution of Marks for BA English Language and Literature

1. Total Marks for Common Courses	1 to 6 (English)	6x50=300
2. Total Marks for Additional Language Courses	1 to 4 (Languages)	4x50=200
3. Total Marks for Complementary Courses	1 to 4	4x50=200
4. Total Marks for Core Courses	1 to 10&12 to 16	15x50=750
5. Project	1	1x25=25
6. Open Course	1	1x25=25

Total (for the entire Programme) 1500

Internal Assessment (CE)

(20% of the total marks in each Course are for Internal Assessment)

1. Model Examination	5 marks (50%)
2. Attendance	2.5 marks (25%)
3. Assignment/Seminar/Viva	2.5 marks (25%)
(Attendance of each Course may be evaluated as follows)	
90% and above	2.5 marks (100%)
85 to 89%	2 marks (80%)
80 to 84%	1.5 marks (60%)
75 to 79%	1 mark (40%)

(No marks for attendance below 75%)

Distribution of Credits for BA English Language and Literature

Semester	Common Courses		Core Courses				Complementary Courses	Open Course	Total
	English	II Lang							
1	4	3	4				4	-	19
2	4	3	4				4	-	19
3	4		4	4			4	-	20
4	4		4	5			4	-	21
5	-		5	4	4	4	-	2	19
6	-		2	4	4	4	4	-	22
Total	22	16	64				16	2	120

The English Core Courses are as follows:

I. 1B01ENG HISTORY OF ENGLISH LANGUAGE AND LITERATURE

Aims:

- The paper broadly aims at examining the ways in which different social, economic, political and cultural events have informed literary activity in English and to provide students with a historical sense of the evolution of the English Language

Objectives:

- To help students historically contextualize literature
- Enhance their sense of relevant historical contexts
- Illuminate literary study with historical knowledge and understanding
- To acquire comprehensive views of broad periods of English Literature
- To address the existing need of students who are unable to read key literary developments alongside historical and cultural events.
- To equip them with a sound knowledge of the internal development of the English language through the ages, with special reference to key figures who have enriched the language
- To draw the attention of the students to the key points of conjunction between the internal dynamics of the language and the external forces that have exerted pressure on the language
- To consolidate and enhance the students' understanding of the complex interactions between language and its contexts
- To enable the student to understand specific ways in which language has shaped the reactions, perceptions, and beliefs of local, national and global communities.

Course Code	1B01ENG
Title of the Course	History of English Language and Literature
Semester Assigned	1
No. of Credits	4
Contact hours/week	6
Total No. of contact hours	108
Core Text	<i>An Outline of English Literature</i> : G C Thornley and Gwynneth Roberts (Pearson)

Course Outline

Module 1 History of English Language (Three hours/week)

1. Theories of the origin of languages
2. Language families
3. The Indo European family
4. Descent of English
5. Old/Middle/Modern English
6. Renaissance, Reformation and the growth of English language
7. Word formation
8. Individual contributors to the growth of English language
9. Loan words
10. Semantic changes
11. Varieties of English language of the present time (American, Indian(Hinglish), Chinglish, Pidgin, Creole)

Module 2 Introduction to Literature and History of English Literature (Three hours/week)

What is Literature? What is a Text? (From chapter one of Mario Klarer, *Introduction to Literary Studies*, Routledge-2013 London)

1. Old English Literature
2. Middle English Literature
3. Elizabethan Poetry and Prose
4. Elizabethan Drama
5. John Milton and his Time
6. Restoration Drama and Prose
7. English Poets 1660-1798
8. Eighteenth Century Prose
9. Early Nineteenth Century Poets
10. Later Nineteenth Century Poets
11. Nineteenth Century Novelists
12. Other Nineteenth Century Prose
13. Twentieth Century Novels and other Prose
14. Twentieth Century Drama
15. Twentieth Century Poetry

Suggested Reading: (for History of Language)

1. Baugh, A.C *History of English Language* CUP 2002
2. Jespersen, Otto, *Growth and Structure of English Language* Chicago University Press
3. Mugglestone, Lynda. *The Oxford History of English* O U P 2006
4. Wrenn, C L. *The English Language*. Vikas New Delhi: Vikas 2000
5. F T. Wood. *An Outline History of English Language*
6. Yule, George. *The Study of Language* ; C U P 2000

Suggested Reading: (for History of Literature)

1. Alexander, Michael: *A History of English Literature*, New York: Palgrave 2007

2. Drabble Margaret, *The Oxford Companion to English Literature*, O U P 1995
3. Evans, Ifor. *A Short History of English Literature*, London: Penguin 1963
4. Nayar, Pramod. *Short History of English Literature*, C U P 2014
5. Peck, John and Martin Coyle *A Brief History of English Literature*, Palgrave 2002
6. Poplawski, Paul Ed. *English Literature in Context*. C U P 2008
7. *History of English Literature*: by John Mulgan and D M Davin, Oxford Clarendon Press
8. Sampson, George. *Cambridge History of English Literature*. C U P 2014 (Chapters 6&7 Literary Overview, Texts and issues, pages 546-564 and Literary Overview, pages 618-624)

Topics for assignments and seminars (English Literature)

Literature of the Anglo-Saxon period, Introduction of Printing, Reformation Literature, Cavalier and Puritans, Metaphysical poetry, Restoration Drama, Alexander Pope and Jonathan Swift, Henry Fielding, Smollett, Samuel Richardson, Sir Walter Scott, Thomas Carlyle, the Rossettis, G.M. Hopkins, Charles Dickens, Bertrand Russell, Anglo-Irish Literature (All the writers to be contextualized- placed in relation to relevant historical contexts).

Topics for Assignments/Seminars (English Language). Extended topics from the prescribed syllabus.

Guidelines for Evaluation (1B01ENG)

Internal Evaluation (Total Marks – 10)

- | | |
|------------------------|-----------|
| 1. Model Examination - | 5 Marks |
| 2. Assignment | 1 Mark |
| 3. /Seminar/Viva - | 1.5 Marks |
| 4. Attendance - | 2.5 Marks |

End Semester Examination (Total Marks - 40)

Pattern of Question Paper

Time – 3 Hours

Maximum Marks --- 40

- | | |
|--|----------------|
| 1. One essay (200 words) out of two from Module- 1 | (Marks -1x8=8) |
| 2. One essay (200 words) out of two from topics up to Eighteenth Century Prose(including) of Module- 2 | (Marks -1x8=8) |
| 3. One essay (200 words) out of two from topics 9 to 15 of Module- 2 | (Marks -1x8=8) |
| 4. Two out of three questions(80words) from Module- 1 | (Marks -2x4=8) |
| 5. Two out of three questions (80 words) from Module- 2 | (Marks -2x4=8) |

Model question Paper

1B01ENG History of English Language and Literature

Time 3 hours

Maximum marks 40

- I Write an essay of not more than 200 words on one of the following questions. (1x8=8 marks)
1. Trace the descent of English as a member of the Indo-European family of languages.
 2. Briefly describe any 5 processes of word formation in the English language.
- II Write an essay of not more than 200 words on one of the following questions. (1x8=8 marks)
3. Why is Elizabethan England considered as the period during which the Renaissance flourished?
 4. Eighteenth century England is known for the development of the prose form. Elucidate.
- III Write an essay of not more than 200 words on one of the following questions. (1x8=8 marks)
5. What changes in the field of poetry did the Romantic Movement usher in?
 6. Trace the major developments in drama during the 20th century.
- IV Answer two out of three questions in about 80 words each. (2x4= 8 marks)
7. French loan words in English.
 8. Shakespeare's contribution to the English language
 9. Chinglish
- V Answer two out of three questions in about 80 words each. (2x4= 8 marks)
10. What are text types and discourses?
 11. Tennyson and Browning.
 12. Major developments in the novel in 20th century.

II. 2B02ENG STUDIES IN PROSE

Aims :

- The style, literary form, and intended impact on the reader. The paper broadly aims at enabling the student to analyse the relationships among authors

Objectives:

- The student will understand the relationships between and among elements of literature, including tone, point of view, style and theme.
- The student will learn to examine a literary selection from several critical perspectives.
- The student will be able to engage in in-depth reading of the works of masters of prose, which will help in the formation of an effective prose style.

Course Code	2B02ENG
Title of the Course	Studies in Prose
Semester Assigned	2
No. of Credits	4
Contact hours/week	6
Total No. of contact hours	108
Core Text	1 <i>The Best Words: An Anthology of Prose</i> Orient Blackswan 2. <i>Literary Terms and Criticism</i> : John Peck and Martin Coyle. Basingstoke; Palgrave, 2005

Course Outline

Module 1 Literary Terms (One hour/week)

Essay, Biography, Autobiography, Travel Writing, Text, Form and Content, Satire, Narratology, Ideology, Hegemony, Subject, Motif and Theme, Discourse, Periodical Writing, Editorials, Technical Writing.

Module 2 (3 hours/week)

1. The Book of Ruth : (From the King James A V Bible)
2. Of Parents and Children : Francis Bacon
3. Sir Roger and the Widow : Richard Steele
4. South Sea House : Charles Lamb
5. Addresses at the Parliament of Religions : Swami Vivekananda

Module 3 (2 hours/week)

1. Professions for Women : Virginia Woolf
2. How to Get Rid of Intellectual Rubbish : Bertrand Russell
3. In Praise of Mistakes : Robert Lynd
4. The Worship of the Wealthy : G K Chesterton
5. How I Became a Public Speaker : George Bernard Shaw

Suggested Reading:

1. Hudson, W.H. *Introduction to the Study of Literature*, London: Harrap, 1961.
2. Murry, J.M. *The Problem of Style*. London: OUP, 1922.
3. Upham, A. H. *The Typical Forms of English Literature*. Oxford: OUP, 1950.
4. Walker, H. *The English Essay and Essayists*. London: J. M. Dent, 1915.

Topics for Assignments/Seminars :

Montaigne, Francis Bacon, The Essay and the beginning of modern English prose, Daniel Defoe, Jonathan Swift, Thomas Babington Macaulay the Periodical, Joseph Addison and Richard Steele, Spectator, Tatler, Guardian, 18th Century Coffee Houses, Samuel Johnson, Oliver Goldsmith, Reviews and Magazines of the 19th century, William Hazlitt, Charles Lamb, Walter Savage Landor, Thomas De Quincey, John Ruskin, John Henry Newman, Bertrand Russell, Aldous Huxley, E.V. Lucas, G.K. Chesterton, J. B. Priestley, Virginia Woolf, Robert Lynd, George Orwell, George Bernard Shaw, A.G. Gardiner, Max Beerbohm, Jawaharlal Nehru, Mahatma Gandhi, Nirad C. Chaudhuri

Guidelines for Evaluation (2B02ENG)

Internal Evaluation (Total Marks – 10)

1. Model Examination - 5 Marks
2. Assignment- 1 Mark
3. Seminar/Viva - 1.5 Marks
4. Attendance - 2.5 Marks

Pattern of Question Paper

Time – 3 Hours

Maximum Marks --- 40

1. One essay (200 words) out of two from Module- 2 (Marks -1x8=8)
2. One essay (200 words) out of two from Module- 3 (Marks -1x8=8)
3. Four out of six questions(80words) from all Modules (Marks -4x4=16)
4. Eight out of ten short answer questions from all Modules (Marks -8x1=8)

Model Question Paper

2B02ENG – Studies in Prose

Time 3 hours

Maximum marks 40

- I. Write an essay of 200 words on **one** of the following: (1x8= 8 marks)
1. Analyse Ruth’s story as a parable of the faithful convert.
 2. Discuss “Sir Roger and the Widow” as a gentle satire on the social manners of 18th century society
- II. Write an essay of 200 words on **one** of the following: (1x8= 8 marks)
3. Trace the struggles of the early woman writer as explored by Woolf in ”Professions for Women.”
 4. Discuss “The Worship of the Wealthy” as a critique of class snobbery.
- III. Answer **four** of the following in about 80 words: (4x4=16 marks)
5. How has India, according to Swami Vivekananda, displayed religious tolerance?
 6. What does Lynd have to say about writers who perpetrated errors?
 7. What was the trick that Shaw ventured on at the meeting in favour of Women’s Suffrage?
 8. How is John Tipp depicted in “The South Sea House”?
 9. Discuss Bacon’s argument that the practices of parents will have enduring effects on children.
 10. What is Russell’s advice about dealing with conceit?
- IV. Answer **eight** of the following in not more than two sentences: (8x1=8 marks)
11. How did Shaw arm himself against the accusation of being a professional agitator?
 12. Name one amusing way in which flattery is done by a journalist.
 13. How does Lynd prove that he himself is a nervous lover of accuracy?
 14. What is Russell’s advice about avoiding fear?
 15. Why did Woolf decide to kill the Angel in the House?
 16. What horrible demons, according to Swami Vivekananda, have possessed this earth?
 17. How, according to Lamb, do noblemen acquire a stoop?
 18. What did the widow declare Sir Roger de Coverley to be?
 19. Why did Naomi insist that she be called Mara?
 20. What is the style followed by Bacon in his essays?

III. 3B03ENG Linguistics

Aims:

- The paper broadly aims at helping the students to make appropriate adjustments in language use for social, academic, and life situations, demonstrating sensitivity to gender and cultural bias.
- It also aims at helping students to communicate ideas and information effectively.

Objectives:

- To provide clear and detailed explanations of the basic building blocks of the language, grammar, usage, spelling and punctuation.
- To help students to refine vocabulary for interpersonal, academic and workplace situations, including figurative, idiomatic and technical meanings and make highly effective word choices
- To help students write fluently for a variety of occasions, audiences, and purposes, and to make appropriate choices regarding style, tone, level of detail and organization
- To enable students integrate a sound knowledge of grammar into life skills as well as academic contexts.
- To acquire a mature command of language, use varied sentence structures, and make few, if any, convention errors in mechanics, usage, punctuation, and spelling
- To provide crisp, practical definitions of the central concepts in grammar
- To improve the ability of students to speak English with global intelligibility
- To help the students to speak language accurately with the right pronunciation, word and sentence stress and intonation.
- To enable the students to use speaking strategies effectively.
- To empower the student to apply oral communication skills in interviews, group presentations, formal presentations and impromptu situations.
- To convince the students about the key role played by pronunciation in listening and speaking.

Course Code	3B03ENG
Title of the Course	Linguistics
Semester Assigned	3
No. of Credits	4
Contact hours/week	5
Total No. of contact hours	90
Core Text	<i>English Phonetics and Phonology</i> - Peter Roach C U P 2009

1. Course Outline

Module 1 – Language

1. Language defined (Form and Function)
2. Language and Linguistics (Language as a scientific study) (Qualities and parameters of scientific study.)
3. Animal communication system and human language. (Verbal and Nonverbal)
4. Branches of Linguistics. (Socio, psycho, computational, anthropological)

Module 2 – Phonetics and Phonology

1. Speech Organs
2. Speech Sounds
 - a. Classification of Vowels: Pure Vowels, Diphthongs, Triphthong
 - b. Classification of Consonants
3. Basic Principles of Phonology
 - a. Phone, phoneme, allophone
 - b. Discovery procedure (Contrast, Distribution, Free variant etc)
 - c. Consonant Clusters
 - d. Assimilation, Elision
4. Supra-segmental features
5. Stress, Pitch, Intonation, Juncture
6. Syllable Structure
7. Transcription
8. Articulation and Auditory Exercises

Module 3 – Morphology and Semantics

1. Basic concepts of Morphology
2. Morph, Morpheme, Allomorph
3. Elements of Word building
 - a. Free morpheme, Bound morpheme, (Affix)
 - b. Root, Stem, Word; Simple, Complex, Compound words.
4. Word Formation
5. Basic Principles of Semantics
 - a. Concepts of Meaning
 - b. Types of Ambiguity

Module 4: Syntax

1. Grammar and Usage
2. Open classes and Closed Classes (Lexical and Grammatical)
3. Phrase, Clause and Sentence.
4. Phrases and their structures
5. Clauses and their structures
6. Clause elements or Verb patterns
7. Classification of Sentences according to:
 - a. Word order & Meaning
 - b. Clause structure.
8. Auxiliary Verbs – Mood and Tense

9. Analysis, Synthesis and Transformation of all types of sentences
(Practical Exercises to be given in the prescribed areas)

Grammar Core Text:

1. *Essential English Grammar* – Raymond Murphy. New Delhi: Cambridge UP, 2013. Phonetics Core Text:
2. *English Phonetics and Phonology*- Peter Roach. New Delhi: Cambridge UP, 2009.

Reading list (Core reading)

1. *An Introduction to the Pronunciation of English* (Core) A.C Gimson London, 1980
2. *English Phonetics and Phonology*- Peter Roach C U P 2009
3. *Language and Linguistics: An Introduction* John Lyons Cambridge University Press, 1999
4. *A Student's Introduction to English Grammar*. Rodney Huddleston and Geoffrey K. Pullum
5. *Contemporary English Grammar: Structures and Composition* David Green Macmillan

Further reading

1. *Key Concepts in Language and Linguistics* R.L. Trask Routledge, 2004
2. *Elements of General Linguistics* Andre Martinet Midway Reprint Series
3. *Practical English Usage* Michael Swan Oxford University Press, 2005
4. *Linguistics and English Grammar* H.A. Gleason Holt, Rinehart & Winston, Inc., 1965.
5. *New Horizon in Language* John Lyons (Ed.) Pelican Books, 1970
6. *English Pronunciation in Use* Mark Hecock Cambridge University Press, 2003
7. *A Practical English Grammar* Thomson and Martinet Oxford University Press
8. *An Introduction to Language and Linguistics* Christopher J. Hall Viva Continuum Edition, 2008
9. *Introducing Phonology* David Odden Cambridge University Press, 2005
10. *Linguistics: A Very Short Introduction* P. H. Matthews Oxford University Press

Sample Topics for Assignments

Language and society – Branches of Linguistics – Bilingualism – The Need for the Study of Grammar – RP and Standard English – Approaches to the Study of Grammar – Linguistics as a Science

Suggested Reading:

Grammar:

1. Allsop, Jake. *Cassell's Students' English Grammar*. London: English Language Book Society, 1986.
2. Leech, Geoffrey .Margaret Deuchar et al. *English Grammar for Today: A New introduction*. London: Palgrave, 2005.
3. Peters, Pam .*Cambridge Guide to English Usage*. London: CUP, 2004.
4. Roberts, Paul .*Modern Grammar* . New York: Harcourt, 1968.
5. Roberts ,Paul. *English Syntax* . New York: Harcourt, 1964.
6. Quirk, Randolph .*The Use of English*. New York: St. Martin's Press, 1964.
7. Wood ,F.T. *Current English Usage* . London: Macmillan, 1990.
8. Yule, George.*The Study of Language*. Cambridge:CUP, 2000.

Phonetics:

1. Collins, Beverley and Inger M. Mees. *Practical Phonetics and Phonology*. London: Routledge, 2008.
2. Connor, J.D. O. *Phonetics*. London: Penguin, 1973.
3. Hancock ,Mark. *English Pronunciation in Use* . Delhi: Cambridge, 2013.

4. Jones, Daniel. *English Pronouncing Dictionary* . Cambridge. Cambridge UP, 2006.
5. Marks, Jonathan. *English Pronunciation in Use* .New Delhi: Cambridge UP, 2007. Rpt. 2012.

Linguistics:

1. Crystal, David. *Linguistics*. Harmondsworth: Penguin, 1971.
2. Lyons, John. *Language and Linguistics*. Cambridge: CUP, 1981.
3. Verma, S.K and .N. Krishnaswamy. *Modern Linguistics: An Introduction*. New Delhi: OUP, 1989.
4. Wallwork, J.F. *Language and Linguistics : An Introduction to the Study of Language*. London: Heinemann, 1969.

Topics for Assignments/Seminars :

Grammar:

Parts of speech, Different concepts of meaning, Basic concepts in Morphology, Various branches of Linguistics, British and American English, Sentence Structures and any other topics based on the prescribed text.

Phonetics:

Phonemes, The Production of speech sounds, Fricatives and Affricates, Nasals, The Syllable, Strong and Weak syllables, Stress in simple and complex words, Phonemic analysis, Aspects of Connected speech, Organs of Speech, Speech Sounds, Intonation, Tones and Tone languages, Functions of Intonation, Attitudinal, Accentual, Grammatical, Discourse function, Varieties of English pronunciation, Geographical variations etc.

Guidelines for Evaluation (3B03ENG)

Internal Evaluation (Total Marks – 10)

- | | |
|------------------------|-----------|
| 1. Model Examination - | 5 Marks |
| 2. Assignment | 1 Mark |
| 3. /Seminar/Viva - | 1.5 Marks |
| 4. Attendance - | 2.5 Marks |

End Semester Examination (Total Marks - 40)

Pattern of Question Paper

Time – 3 Hours

Maximum Marks --- 40

- | | |
|---|-------------------|
| 1. One essay (200 words) out of two from Module- 1 | (Marks -1x8=8) |
| 2. One essay (200 words) out of two from Module- 2 | (Marks -1x8=8) |
| 3. Two out of three questions(80words) from Module- 3 | (Marks -2x4=8) |
| 4. A short passage for phonetic transcription | (Marks -1x2=2) |
| 5. Fourteen short answer questions from all modules | (Marks – 14x1=14) |

(Model question paper will be provided later)

IV. 3B04ENG English in the Internet Era

Aims:

- The paper broadly aims at helping students to effectively integrate multimedia and technology into learning

Objectives:

- To enable the student to use a variety of electronic media, such as the Internet, information services and desk-top publishing software programs, to create, revise, retrieve and verify information
- To help the student to synthesize information from multiple sources to draw conclusions
- To help the student to select and use appropriate study and research skills and tools according to the type of information being gathered or organized from information services
- To familiarise the students with the most recent developments in the integration of Web 2.0 technologies with literature.

Course Code	3B04ENG
Title of the Course	English in the Internet Era
Semester Assigned	3
No. of Credits	4
Contact hours/week	4
Total No. of contact hours	72
Core Text	<i>English in the Internet Era</i> (New Delhi: Medtec-An Imprint of Scientific International (Pvt) Ltd)

Course Outline

Module 1(1 hr)

1. ICT in Education: An Overview
2. Key Challenges in Integrating ICTs in Education: Technology enhanced teaching/learning; technology, pedagogy and content.
3. Advantages: Individualised, Customised/learner-centric approach. Measurability. Wider reach.
4. What is capacity building? ICT capacity building.
5. Learning Technologies for Second Language Teaching/Learning.
6. Gamification of Education: Digital, game-based language learning.

Module 2 (1 hr)

1. Virtual learning environment: Mobile, Web, LAN, Interactive White Board, e-learning tools, online tutoring and virtual university, e-literature, e-brary, e-book readers, Edutainment, CEC-Edusat, Infilibnet, Commercial Text to Speech (TTS) tools.
2. Collaborative Learning Environment: Forums, Userboard, Blog, Photosharing, Videosharing, Collaborative Writing Environment, Wikieducator; Web 2.0, Social Media, Edutopia
3. Audio-Visual Environment: Video conferencing, Skype, i-tunes, Webcast, podcast.

Module 3 (2 hrs)

1. Bridging Technology and English Language Learning:
2. Blended Language Learning
3. Mobile Assisted Language Learning
4. Online Dictionary, Online Thesaurus, Dynamo Dictionary, Vocabulary.com Lexipedia, Wordia, BBC Learning English, Vocabulary Games, Quizzes, Puzzles
5. Internet Communication: NetLingo, Text Messages, Alphanumeric abbreviations in English, Acronyms, Smileys, Emoticons.
6. Word processors, databases, hyper textmark up language (HTML), graphics and multimedia,
7. Desktop publishing, communication programmes (browsers, email, chat, collaboration tools, web designing)
8. Online editing, use of revision marks, use of templates
9. Literature in the Internet Era:
10. Electronic Fiction
11. Narrabases (non-sequential novels that rely on large computer databases)
12. Interactive Fiction Games, Visual Novels, Collaborative Fiction, Bookware
13. Computer mediated fiction or poetry, Storytelling in the Era of WWW, Hyperfiction, Hypertext fiction, Hypernarrative.

(Core Text: Text to be brought out)

Suggested Reading:

1. Marsh, Debra: Blended Learning: Creating Learning Opportunities for Language Learners
2. Stanley, Graham: Language Learning with Technology: Ideas for Integrating Technology in the Classroom (Cambridge Handbooks for Language Teachers)
3. Berger, Pam and Trexler, Sally: Choosing Web 2.0 Tools for Learning and Teaching in a Digital World

4. Richardson, Will: Blogs, Wikis, Podcasts, and Other Powerful Web Tools for Classrooms.
5. Wankel, Charles and Blessinger Patrick: Increasing Student Engagement and Retention in e-Learning Environments: Web 2.0 and Blended Learning Technologies (Cutting-Edge Technologies in Higher Education)
6. Ramirez, Lori Langer de Empower. English Language Learners With Tools From the Web.
7. Levy, Mike and Stockwell, Glenn: Call Dimensions: Options and Issues in Computer Assisted Language Learning (ESL & Applied Linguistics Professional)
8. Yiyu, Cai: Interactive and Digital Media for Education in Virtual Learning Environments
9. Edited by Schmid, EulineCutrim and Whyte, Shona: Teaching Languages with Technology: Communicative Approaches to Interactive Whiteboard Use.

Web Resources:

1. <https://www.khanacademy.org>
2. <http://www.bbc.co.uk/worldservice/learningenglish>
3. <http://www.brainpopesl.com>

Topics for Assignments/Seminars:

1. Written assignments on Online Learning tools, Online Universities, ICT and rural communities or any topic listed in the syllabi.
2. Creation of a class blog and the active participation of each student to be monitored and graded.
3. Creation of a class community on a social networking site (facebook or twitter) to discuss academic matters.
4. Creation of a video podcast by students on campus life, review of the books that they have read or films that they have watched.
5. Form a userboard and forum for the college in which every student can participate and share views.

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**Guidelines for Evaluation (3B04ENG)**

Internal Evaluation (Total Marks – 10)

- |                        |           |
|------------------------|-----------|
| 1. Model Examination - | 5 Marks   |
| 2. Assignment          | 1 Mark    |
| 3. /Seminar/Viva -     | 1.5 Marks |
| 4. Attendance -        | 2.5 Marks |

End Semester Examination (Total Marks - 40)

**Pattern of Question Paper**

Time – 3 Hours

Maximum Marks --- 40

- |                                                                 |                  |
|-----------------------------------------------------------------|------------------|
| 1. One essay (200 words) out of two from Module- 1              | (Marks -1x8=8)   |
| 2. Two out of three questions(80words) from Module- 2           | (Marks -2x4=8)   |
| 3. Two out of three questions(80words) from Module- 3           | (Marks -2x4=8)   |
| 4. Sixteen short answer questions out of twenty from all Module | (Marks -16x1=16) |

(Model question paper will be provided later)

## V. 4B05ENG Studies in Poetry

### Aims:

- The paper broadly aims at helping the students to respond effectively as well as critically to poetry.

### Objectives:

- To help the student to understand the different stylistic, thematic and technical qualities present in the poetry of different cultures and historical periods.
- To enable the student to identify the characteristics that distinguish different poetic forms and genres.
- To introduce the student to the diversely experimental and vigorously innovative modes of poetry.
- The student will learn to identify universal themes prevalent in the literature of all cultures.

|                            |                                                                                                                                        |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Course Code                | 4B05ENG                                                                                                                                |
| Title of the Course        | Studies in Poetry                                                                                                                      |
| Semester Assigned          | 4                                                                                                                                      |
| No. of Credits             | 4                                                                                                                                      |
| Contact hours/week         | 4                                                                                                                                      |
| Total No. of contact hours | 72                                                                                                                                     |
| Core Text                  | 1. <i>The Poet's eye</i> CUP Hyderabad<br>2. <i>Literary Terms and Criticism</i> : John Peck & Martin Coyle, Basinstock. Palgrave 2005 |

## Course Outline

### Module 1(1Hour/Week)

Literary Terms: Alliteration, Poetic Diction, Assonance and Consonance, Ballad, Blank Verse, Conceit, Dramatic Monologue, Elegy, Metre, Ode, Rhyme, Rhythm, Sonnet , Stanza, Metaphor and Simile ,Lyric and Lyrical Ballad, Metaphysical Poetry, Mock Heroic, Heroic Couplet

**(All poems in all modules are for detailed study)**

### Module 2(1Hour/Week)

1. When in Disgrace : William Shakespeare
2. Canonization : John Donne
3. Satan's Speech : John Milton  
(from Paradise Lost Book II by Lines 11-42 "Powers and dominions, deities of heaven... who can advise may speak")
4. Belinda : Alexander Pope  
(from Rape of the Lock Lines 123- 144."Robed in white... lightnings quicken in her eyes"-23 lines)
5. Auguries of Innocence- William Blake
6. Elegy Written in A Country Churchyard : Thomas Gray

### Module 3 (1 hour/week)

1. Kubla Khan : S.T. Coleridge
2. My Last Duchess : Robert Browning
3. To the Indians who died in South Africa : T.S Eliot
4. Second Coming : W.B. Yeats
5. Windhover : G. M. Hopkins
6. Unknown Citizen : W.H. Auden

### Module 4 (1 hour/week)

1. Because I Could Not Stop for Death : Emily Dickinson
2. Digging : Seamus Heaney
3. Mirror : Sylvia Plath
4. Do not Go Gentle : Dylan Thomas
5. Her Husband : Ted Hughes
6. Subaltern : Siegfried Sassoon

### Suggested Reading:

1. Corcoran, Neil. *English Poetry since 1940*. London: Longman, 1993.
2. Draper, R.P. *An Introduction to Twentieth Century Poetry in English*. Basingstoke, Palgrave,1999.
3. Emig, Rainer. *Modernism in Poetry*. London:Longman, 1995
4. Furniss, Tom and Michael Bath. *Reading Poetry- An Introduction*. London: PrenticeHall, 1996.
5. Hobsbaum, Philip. *Metre, Rhythm and Verse Form*.London:Routledge, 2006 .
6. Matterson, Stephen and Daryl Jones. *Studying Poetry*. London:Arnold, 2000.
7. Thomas, C.T. Ed. *Chaucer to Housman Vol I* .New Delhi: B.I. Publications 1987.
8. Thomas, C.T. Ed. *Chaucer to Housman Vol II*. New Delhi: B.I. Publications 1990.

Topics for Assignments/Seminars :

Poetical types- Satire, Epic, Idyll, Ballad, Elegy, Sonnet, Lyric, Ode, Heroic Couplet, Imagism, Symbolist Movement, Free Verse etc., Stanza forms, Metrical forms, Schools and Movements, the Metaphysicals, the Classical Movement, Romantic Revival, Victorian poetry Pre-Raphaelites, Fin de Siecle movement, Georgian poets, Poets of the First and Second World Wars, High Modernist poetry, Post-Modernist poetry, Spatialist poetry of France, Avant-garde poetry in Italy, Fusion poetry in Canada, L=A=N=G=U=A=G=E poets in the U.S., Modernist poetry in Australia.

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### **Guidelines for Evaluation (4B05ENG)**

Internal Evaluation (Total Marks – 10)

- |                        |           |
|------------------------|-----------|
| 1. Model Examination - | 5 Marks   |
| 2. Assignment          | 1 Mark    |
| 3. /Seminar/Viva -     | 1.5 Marks |
| 4. Attendance -        | 2.5 Marks |

End Semester Examination (Model question paper will be provided later)  
(Total Marks - 40)

### **Pattern of Question Paper**

Time – 3 Hours

Maximum Marks --- 40

- |                                                                  |                 |
|------------------------------------------------------------------|-----------------|
| 1. One essay (200 words) out of two from Modules 2&3             | (Marks -1x8=8)  |
| 2. Four out of six questions (Annotations) from Modules- 2,3&4   | (Marks -4x4=16) |
| 3. Two out of three questions(80words) from Module- 1            | (Marks -2x4=8)  |
| 4. Eight out of ten short answer questions from Modules – 2,3 &4 | (Marks -8x1=8)  |

(Model question paper will be provided later)

#### 4. 4B06ENG Literary Criticism

##### Aims:

- To acquaint the students with fundamental and influential ideas that have a bearing on literary creation and understanding of literature

##### Objectives:

- To awaken students' appreciative and critical faculties and so encourage their development as readers of literature.
- To provide the students with an adequate understanding of literary/critical terminology, key concepts, technical terms and theories.
- To develop a critical temper in the students.
- To familiarize the student with received ideas that enjoy universal reception in the context of literary study.
- Give clear explanations of the links and the disagreements between different thinkers and schools.

|                            |                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Course Code                | 4B06ENG                                                                                                                                                                                                                                                                                                                                                                    |
| Title of the Course        | Literary Criticism                                                                                                                                                                                                                                                                                                                                                         |
| Semester Assigned          | 4                                                                                                                                                                                                                                                                                                                                                                          |
| No. of Credits             | 5                                                                                                                                                                                                                                                                                                                                                                          |
| Contact hours/week         | 5                                                                                                                                                                                                                                                                                                                                                                          |
| Total No. of contact hours | 90                                                                                                                                                                                                                                                                                                                                                                         |
| Core Texts                 | 1.Prasad,B. <i>An Introduction to English Criticism</i> . Delhi: Macmillan, 1965.<br>2.Barry ,Peter. <i>Beginning Theory</i> . New Delhi:Viva,2008. Rpt. 2010<br>3.Peck, John and Martin Coyle. <i>Literary Terms and Criticism</i> . London:Palgrave,2005.<br>4.Devy, G.N. <i>Indian Literary Criticism: Theory and Interpretation</i> . Hyderabad: Orient Longman, 2002. |

## Course Outline

### Module I (1 hour)

Literary Terms: Genre (definition only), Archaism, Allegory, Allusion, Ambiguity, Archetype, Epic and Epic Simile, Epithalamion, Free Verse, Imagery, Figurative Language, Imagism, Irony, Symbol, Verse Epistle, New Criticism, New Historicism, Cultural Materialism.

### Module II (2 hours)

Classical Criticism, Neoclassical, Romantic and Victorian Literary Criticism, Indian Aesthetics

Aristotle

Plato

Dr. Johnson

Wordsworth

Sanskrit Poetics- An Overview – K. Krishnamoorthy (from *Indian Literary Criticism* – G.N. Devy)

### Module III (1 hour)(From Beginning Theory – Peter Barry)

1.Chapter I – Liberal Humanism: The History of English Studies – Ten tenets of Liberal Humanism

2.Chapter II – Structuralist chickens and Liberal Humanist eggs, Signs of the Fathers- Saussure, The Scope of Structuralism, What Structuralist critics do, Structuralist criticism, examples

### Module IV (1 hour) )(From Beginning Theory – Peter Barry

3.Chapter V- Psychoanalytic Criticism: Introduction, How Freudian Interpretation works, what Freudian Psychoanalytic critics do, Freudian Criticism: Some examples. Lacan (pages 108-112 including definition of ‘Condensation.’)

4.Marxist Criticism –Beginnings and basics of Marxism, Marxist Literary Criticism, General, the Present, the Influence of Althusser, What Marxist critics do, Marxist Criticism – an example.

### Suggested Reading:

1. Abrams, M.H. *A Glossary of Literary Terms*. Bangalore: Prism, 1993.
2. Hawthorn, Jeremy. *A Concise Glossary of Contemporary Literary Theory* . London: Arnold, 2000.
3. Leitch, Vincent B. Ed. *The Norton Anthology of Theory and Criticism*. London: Arnold, 2000.
4. Peck , John and Martin Coyle. *Practical Criticism* . Basingstoke: Palgrave, 2005.
5. Guerin, Wilfred I. *Earle Labor et al. A Handbook of Critical Approaches to Literature*. Oxford: OUP, 1998.
6. Prasad,B. *Background to the Study of Literature*. New Delhi: Macmillan, 1995. Revised Edn. 1999.
7. Nagarajan, M.S. *English Literary Criticism-An Introductory History*. Hyderabad: Orient Blackswan, 2006.

### Topics for Assignments/Seminars :

Horace, Longinus, Medieval and Renaissance Criticism, Ben Jonson, Philip Sidney, John Dryden, Alexander Pope, Matthew Arnold, Augustan Critics, Neo- Classical Critics, Romantic and Victorian Criticism, 20<sup>th</sup> Century Criticism, I. A. Richards, A.C. Bradley, F.R. Leavis, Cleanth Brooks, New Critics, Formalists.

## **Guidelines for Evaluation (4B06ENG)**

Internal Evaluation (Total Marks – 10)

- |                        |           |
|------------------------|-----------|
| 1. Model Examination - | 5 Marks   |
| 2. Assignment          | 1 Mark    |
| 3. Seminar/Viva        | 1.5 Marks |
| 4. Attendance          | 2.5 Marks |

End Semester Examination (Total Marks - 40)

### **Pattern of Question Paper**

Time – 3 Hours

Maximum Marks - 40

- |                                                             |                 |
|-------------------------------------------------------------|-----------------|
| 1. One essay (200 words) out of two from Module- 1          | (Marks -1x8=8)  |
| 2. One essay (200 words) out of two from Modules- 3&4       | (Marks -1x8=8)  |
| 3. Four out of six questions(80words) from all Modules      | (Marks -4x4=16) |
| 4. Eight short answer questions out of ten from all Modules | (Marks -8x1=8)  |

### **Kannur University**

### **Model Question Paper**

4B06Eng - Literary Criticism

Time 3hours

Maximum marks 40

- I. Write an essay of 200 words on one of the following: (1x8= 8 marks)
1. Aristotle's concept of tragedy.
  2. Elucidate the general features of Victorian literary criticism?
- II. Write an essay of 200 words on one of the following: (1x8=8 marks)
3. What are the tenets of liberal humanism?
  4. Attempt an overview of recent Marxist thinking on literature.
- III. Answer four of the following in about 80 words: (4x4= 16 marks)
5. Analyse New Historicism and Cultural Materialism.
  6. Dr. Johnson's observation on the unities.
  7. Wordsworth's concept of poetic diction.
  8. Why is Rasa described as the very essence of all literature?
  9. Explicate the five codes identified by Barthes.
  10. What are the psychic processes that have influenced Freudian terminology?



IV. Answer eight of the following in not more than two sentences:

(8x1=8 marks)

11. What is a verse epistle?
12. Explain what is meant by archaism.
13. What is meant by irony?
14. What are the major literary genres mentioned by Bhamaha?
15. What are repressive structures?
16. What is an archetype?
17. In what way did Saussure's work differ from that of nineteenth century linguistic scholars?
18. What is meant by an epic simile?
19. Why did Plato indict poetry?
20. What is meant by the technique of Practical Criticism?

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## VII. 5B07ENG Modern Critical Theory

### Aims:

- The paper aims at acquainting the students with fundamental and influential ideas that have a bearing on literary creation and understanding of literature

### Objectives:

- To provide the students with an adequate understanding of literary/critical terminology, key concepts, technical terms and theories.
- To develop a critical temperament in the students.
- To familiarize the student with received ideas that enjoy universal reception in the context of literary study.
- To stimulate debate and enhance understanding of literature in the context of social structure, gender relations, national identity and so on.
- To introduce the students to some of the best writings in the field of criticism practice and the formation of theory.

|                            |                                                                                                                                                                                                                                                                                      |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Course Code                | 5B07ENG                                                                                                                                                                                                                                                                              |
| Title of the Course        | Modern Critical Theory                                                                                                                                                                                                                                                               |
| Semester Assigned          | 5                                                                                                                                                                                                                                                                                    |
| No. of Credits             | 5                                                                                                                                                                                                                                                                                    |
| Contact hours/week         | 6                                                                                                                                                                                                                                                                                    |
| Total No. of contact hours | 108                                                                                                                                                                                                                                                                                  |
| Core Texts                 | 1. <i>Beginning Theory</i> – Peter Barry . New Delhi: Viva, 2008. Rpt. 2010.<br>2. <i>Literary Terms and Criticism</i> – John Peck and Martin Coyle. London: Palgrave, 2002.<br>3. <i>The Norton Anthology of Theory and Criticism</i> – Ed. Vincent B. Leitch. London: Norton 2000. |

## Course Outline

### Module 1 (1 hour)

Literary Terms: Canon, Defamiliarisation, Metonymy, Paradox, Pathetic Fallacy, Patriarchy, Satire, Gaze, Orientalism, Eurocentrism.

### Module2-Modern Critical Theory(From Beginning Theory – Peter Barry) (1hour)

1. Post-structuralism and Deconstruction – Some theoretical differences between structuralism and post-structuralism- figure on page 72, What Post-structuralist critics do, Deconstruction, an example.
2. Postmodernism- What is Postmodernism? What was Modernism? Landmarks in Postmodernism- Habermas, Lyotard, Baudrillard, Postmodernism- an example.

### Module3 (2 hours)

1. Feminist criticism- Feminism and Feminist criticism, Feminist criticism and the role of theory, what Feminist critics do, Feminist criticism- an example.
2. Post-Colonial Criticism- Background , what Post-Colonial critics do, Post-Colonial Criticism – an example.

### Module 4( 2 hours)

- 1.From Columbus to Sachin Tendulkar- R.Viswanathan
- 2.World of Wrestling- Roland Barthes
- 3.Laugh of the Medusa- Helene Cixous (“I shall speak... white ink)
- 4.Marxism and Literature – Edmund Wilson (First 10 paragraphs)
- 5.An Image of Africa: Racism in Conrad’s Heart of Darkness- Chinua Achebe
- 6.The Power of Forms in the English Renaissance- Stephen Greenblatt

### Suggested Reading:

1. Abrams, M.H. *A Glossary of Literary Terms*. Bangalore:Prism, 1993
2. Bennett, Andrew and Nicholas Royle. *Introduction to Literature, Criticism and Theory*. London: Prentice Hall, 1999.
3. Bertens, Hans. *Literary Theory: The Basics* . London: Routledge, 2001.
4. Culler, Jonathan. *Literary Theory: A Very Short Introduction*. Oxford : OUP, 1997.
5. Eagleton, Terry. *Literary Theory: An Introduction*. Minneapolis: U of Minnesota P, 1983.
6. Guerin, Wilfred I. Earle Labor et al. *A Handbook of Critical Approaches to Literature*. . Oxford: OUP, 1998.
7. Hawthorn, Jeremy. *A Concise Glossary of Contemporary Literary Theory* . London: Arnold, 2000.
8. Leitch, Vincent B. Ed. *The Norton Anthology of Theory and Criticism*. London: Norton, 2000.
9. Nagarajan, M.S. *English Literary Criticism-An Introductory History*. Hyderabad: Orient Blackswan, 2006.
10. Peck , John and Martin Coyle. *Practical Criticism* . Basingstoke: Palgrave, 2005.
11. Prasad,B. *Background to the Study of Literature*. London: Arnold, 2000.
12. Webster R. *Studying Literary Theory: An Introduction*. London: Edward Arnold,1990.

### Topics for Assignments/Seminars :

Practical Criticism of prose pieces, dramatic work or poetry of the student’s choice.  
Authors/poets listed in the syllabus may be avoided

## **Guidelines for Evaluation (5B07ENG)**

### Internal Evaluation(Total Marks - 10)

1. Model Examination - 5 marks
2. Assignment- 1 mark
3. Viva/seminar- 1.5 marks
4. Attendance- 2.5 marks

### End Semester Examination(Total Marks - 40)

#### Pattern of Question Paper

Time-- 3 Hours

Maximum Marks—40

1. One essay (200words) out of two from module -3 (Marks- 1x8=8)
2. One essay (200words) out of two from module -4 (Marks- 1x8=8)
3. Six out of eight questions ( 80 words) from modules- 1,2&3 (Marks- 6x4=24)

(Model question paper will be provided later)

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## VIII. 5B08ENG Drama- Theory and Literature

### Aims:

- To foster a mature understanding of drama and dramaturgy.

### Objectives:

- The student will understand the characteristics of major types of drama as well as the classical and medieval precedents that are important for a consideration of drama as a genre.
- The student will concern himself with matters concerning diction and generic expectation- the appropriate styles, conventions and registers of language for a given play.
- The student will learn to analyze the textual functions of drama as a powerful vehicle of social change.
- The student will acquire an understanding of the broader intellectual, cultural and social history that gave rise to the growth of drama.

|                            |                                                                                                                                                                                                                    |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Course Code                | 5B08ENG                                                                                                                                                                                                            |
| Title of the Course        | Drama- Theory and Literature                                                                                                                                                                                       |
| Semester Assigned          | 5                                                                                                                                                                                                                  |
| No. of Credits             | 4                                                                                                                                                                                                                  |
| Contact hours/week         | 6                                                                                                                                                                                                                  |
| Total No. of contact hours | 108                                                                                                                                                                                                                |
| Core Texts                 | 1. Peck, John and Martin Coyle. <i>Literary Terms anCriticism</i> . Basingstoke:Palgrave,2005. 2. Shakespeare, <i>Macbeth</i> ; 3. Eugene O'Neill, <i>Emperor Jones</i> ; 4. G B Shaw, <i>Caesar and Cleopatra</i> |

## Course Outline

### Module I (1 hour)

Literary Terms: (From *Literary Terms and Criticism* – John Peck and Martin Coyle)

Act and Scene, Character, Comedy, Medieval Drama, 19th century drama, Plot, Restoration Comedy, Shakespeare, Tragedy, 20th century Drama

### Module II (2 hours)

*Macbeth* : Shakespeare

### Module III (3 hours)

1. *Emperor Jones* – : Eugene O'Neill
2. *Caesar and Cleopatra* : G.B. Shaw

### Suggested Reading:

1. Belsey, Catherine. *The Subject of Tragedy- Identity and Difference in Renaissance Drama*. London: Methuen, 1985.
  2. Chothia, Jean. *English Drama of the Early Modern Period, 1890-1940*. London: Longman, 1996.
  3. Dollimore, Jonathan. *Radical Tragedy: Religion, Ideology and Power in the Drama of Shakespeare and his Contemporaries*. Brighton: Harvester, 1984.
  4. Drakakis, John. Ed. *Shakespearean Tragedy*. London: Longman, 1992.
  5. Esslin, Martin. *The Field of Drama*. London: Methuen, 1987.
  6. Granville-Barker, H. *Study of Drama*. London: Sedgwick, 1931.
  7. Hawkes, Terence. *Alternative Shakespeares 2*. London: Routledge. 1996.
  8. Williams, Raymond. *Drama in Perspective*. Harmondsworth: Penguin, 1968.
  9. Womack, Peter and Simon Shepherd. *English Drama: A Cultural History*. Cambridge: Blackwell, 1996.
  10. Woodfield, James. *English Theatre in Transition, 1881-1914*. London: CroomHelm, 1984.
- Topics for Assignments/ Seminars:

Medieval Drama, Miracle Plays, Morality Plays, Elizabethan stage and stage craft, History Plays, Roman Plays, Romantic Comedies, Jacobean Drama, Tragicomedy, Comedies, Tragedies, Satiric Comedy, Comedy of Manners, Restoration Drama, Sentimental Drama, Anti-sentimental Drama 19th Century Drama, Melodrama, 20th Century Drama, Problem Plays, Irish Theatre, Poetical Drama, Feminist Theatre, Theatre of the Absurd, Samuel Beckett, Eugene Ionesco, Jean Anouilh, Edward Albee, Black Comedy, Farce, Expressionist Theatre, Epic Theatre, Television plays, Black theatre, the Indian theatre.

### **Guidelines for Evaluation (5B08ENG)**

#### Internal Evaluation(Total Marks - 10)

1. Model Examination - 5 marks
2. Assignment- 1 mark
3. Viva/seminar- 1.5 marks
4. Attendance- 2.5 marks

#### End Semester Examination(Total Marks - 40)

## Pattern of Question Paper

Time-- 3 Hours

Maximum Marks—40

1. One essay (200words) out of two from module -2 (Marks- 1x8=8)
2. One essay (200words) out of two from module -3 (Marks- 1x8=8)
3. Two out of three questions ( 80 words) from module- 1 (Marks- 2x4=8)
4. Two out of three questions ( annotations) from module- 2&3 (Marks-2x4=8)
5. Eight out of ten short answer questions from modules- 2&3 (Marks-8x1=8)

(Model question paper will be provided later)

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## IX. 5B09ENG Studies in Fiction

### Aims:

- To acquaint the students with the distinctive qualities of imaginative writing, such as novels and short fiction, their complex history of development and the reasons for the abiding popularity of these genres.

### Objectives:

- The student will learn to analyze the effectiveness of complex elements of plot, such as setting, major events, problems, conflicts, and resolutions.
- The student will be enabled to understand the novel in the context of its pre-modern history as well as its modern international form.
- The student will be offered a masterful insight into basic values of human nature that abide in the fictional form.
- 

|                            |                                                                                                                                                                                                                 |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Course Code                | 5B09ENG                                                                                                                                                                                                         |
| Title of the Course        | Studies in Fiction                                                                                                                                                                                              |
| Semester Assigned          | 5                                                                                                                                                                                                               |
| No. of Credits             | 4                                                                                                                                                                                                               |
| Contact hours/week         | 6                                                                                                                                                                                                               |
| Total No. of contact hours | 108                                                                                                                                                                                                             |
| Core Texts                 | 1. Peck, John and Martin Coyle. <i>Literary Terms and Criticism</i> . Basingstoke: Palgrave, 2005.<br>2. Emily Bronte, <i>Wuthering Heights</i><br>3. Yann Martel, <i>Life of Pi</i> , New Delhi: Penguin, 2007 |



## Course Outline

### Module I (1 hour)

Literary Terms: (From Literary Terms and Criticism – John Peck and Martin Coyle) 18th century novels, Narrative structure, Tales, Fables, Parables Narrator, Realism, Reflexive Novel, Utopian and Science Fiction, Gothic Novel, Stream of Consciousness, Magical Realism

### Module II Novels (3 hours)

1. *Wuthering Heights* : Emile Bronte
2. *Life of Pi* : Yann Martel

### Module III Short Fiction (2 hours)

1. The Invalid's Story : Mark Twain
2. Wasp's Nest : Agatha Christie
3. The End of the party : Graham Greene
4. The Rocking Horse Winner : D.H.Lawrence
5. The Night the Ghost Got In : James Thurber
6. Love, Love, Love Alone : V. S. Naipaul
7. Tricki Woo : James Herriot
8. Moonlight : Guy de Maupassant

### Suggested Reading:

1. Alter, Robert. *Partial Magic: The Novel as Self-conscious Genre*. Berkeley: University of California Press, 1975.
2. Armstrong, Nancy. *Desire and Domestic Fiction: A Political History of the Novel*. Oxford: OUP, 1987.
3. Marshall, Brenda K. *Teaching the Postmodern: Fiction and Theory*. London and New York: Routledge, 1992.
4. McHale, Brian. *Postmodernist Fiction*. London: Methuen, 1987.
5. Spencer, Jane. *The Rise of the Woman Novelist: from AphraBehn to Jane Austen*. Oxford: Basil Blackwell, 1986.
6. Davies, Lennard J. *Factual Fictions: The Origin of the English Novel*. New York: Columbia UP, 1983.

Topics for assignments/ seminars: The Beginning of the Novel, Epistolary novels, Gothic Novels, 18th century novels, Women novelists, 20th century novels, Science Fiction, Modern Novelists, Picaresque novels, Realism, Psychological realism, Utopian novels, Reflexive novels, Postmodern Fiction.

## Guidelines for Evaluation (5B09ENG)

### Internal Evaluation(Total Marks - 10)

1. Model Examination - 5 marks
2. Assignment- 1 mark
3. Viva/seminar- 1.5 marks
4. Attendance- 2.5 marks

### End Semester Examination(Total Marks - 40)

## Pattern of Question Paper

Time-- 3 Hours

Maximum Marks—40

1. One essay (200words) out of two from module -2 (Marks- 1x8=8)
2. One essay (200words) out of two from module -3 (Marks- 1x8=8)
3. Four out of six questions ( 80 words) from all modules- (Marks- 4x4=16)
4. Eight out of ten short answer questions from all modules (Marks-8x1=8)  
(Model question paper will be provided later)

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## X. 5B10ENG Women's Writing

### Aims:

- To help the students interpret and reinterpret women's experience as described in various kinds of literature, by offering critiques and privileging women writers.
- To restructure the meaning and practice of reading texts, and engender sensitivity to the intersections of subject formations such as race, class, sexuality and gender.

### Objectives:

- To help the students to examine long-standing , dominant, male ideologies
- To foster gender sensitivity
- To critique male notions of value in literature by reexamining the established canon
- To acquaint students with theories of role of gender in writing
- To help the student rediscover the hidden tradition of women's writing
- To initiate the student community into a discussion of the pervasiveness and energy of feminist analysis in literary studies
- The students will turn their attention to the impact of feminist literary theory on the fundamental aspects of literary studies, matters of genre, periodization, and form.
- The paper will provide an opening onto important debates within the discipline of feminist criticism.
- To draw attention to the material and psychological forces behind women's oppression.
- To subject the construction of the literary canon as well as literary traditions to a thorough interrogation.

|                            |                                                                                                          |
|----------------------------|----------------------------------------------------------------------------------------------------------|
| Course Code                | 5B10ENG                                                                                                  |
| Title of the Course        | Women's Writing                                                                                          |
| Semester Assigned          | 5                                                                                                        |
| No. of Credits             | 4                                                                                                        |
| Contact hours/week         | 5                                                                                                        |
| Total No. of contact hours | 90                                                                                                       |
| Core Texts                 | 1.Euripedes, <i>Medea</i><br>2. Alice Walker , <i>Colour Purple</i><br>3.Susan Glasspell, <i>Trifles</i> |

## Course Outline

### Module I (1 hour)

1. *Introduction to Second Sex* : Simone De Beauvoir
2. "Art of Living"- Mahadevi Verma ( excerpted from *The Links of Our Chains*)

### Module II Drama (1 hour)

1. *Medea* : Euripedes
2. *Trifles* : Susan Glaspell

### Module III- Fiction(2 hours)

- Color Purple* : Alice Walker

### Short Fiction

1. A Wagner Matinee : Willa Cather
2. Finest Story in the World : Annie Saumont
3. Afternoon with Shakuntala : Vaidehi
4. Story of an Hour : Kate Chopin
5. The Passion of Mary : Sarah Joseph
6. Tamasha : Jeelani Banu

### Module IV Poetry(1 hour)

1. Lot's Wife : Kristine Batey
2. Latin Women Pray : Judith Ortiz Cofer
3. Draupadi : Sutapa Bhattacharya
4. Aunt Jennifer's Tigers : Adrienne Rich
5. An Ancient Gesture : Edna St. Vincent Millay
6. Combing : Gladys Cardiff
7. Woman's Work : Julia Alvarez
8. Dignity : Bilquees Zafarul Hasan
9. Poem : Pratibha Nandakumar

### Suggested Reading:

1. Barrett, Michele. *Women's Oppression Today*. London: Verso, 1988.
2. Belsey, Catherine and Jane Moore. Eds. *The Feminist Reader: Essays in Gender and the Politics of Literary Criticism*. 2nd edition. Basingstoke, Palgrave, 1997.
3. Christian, Barbara. *Black Feminist Criticism: Perspectives on the Black Women Writer*. New York: Pegamon Press, 1985.
4. Fuss, Diana. Ed. *Inside/Out*. New York and London: Routledge, 1991.
5. Gubar, Susan and Sandra Gilbert. *The Madwoman in the Attic: The Woman Writer and the Nineteenth Century Literary Imagination*. New Haven: Yale UP, 1979.
6. Moi, Toril. *Sexual/Textual politics*. London: Methuen, 1985.
7. Jacobus, Mary. *Women Writing and Writing About Women*. London: Croomhelm, 1979.
8. Eagleton, Mary . Ed. *Feminist Literary Criticism*. London: Longman, 1991.
9. Showalter ,Elaine. Ed. *Speaking of Gender*. London: Routledge, 1989.
10. Showalter ,Elaine. *A Literature of their Own*. London: Virago, 1978.
11. Butler, Judith. *Gender Trouble: Feminism and the Subversion of Identity*. New York and London: Routledge, 1990.

### Topics for Assignments/ Seminars:

Early Feminism, First and Second Wave Feminisms, Radical Feminism, Political Feminism, Feminism in India, Black Feminism, Third World Feminism, Cyberfeminism, Mary Wollstonecraft, Virginia Woolf, Fay Weldon, Alice Walker, Jean Rhys, Toni Morrison, Zora Neale Hurston, ShashiDeshpande, Sarah Joseph, Kamala Das, Ambai, Gracy, Manasi, NabaneetaDevSen, PopatiHiranandani, PratibhaNandakumar etc.

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Guidelines for Evaluation (5B10ENG)

Internal Evaluation(Total Marks - 10)

- | | |
|------------------------|-----------|
| 1. Model Examination - | 5 marks |
| 2. Assignment- | 1 mark |
| 3. Viva/seminar- | 1.5 marks |
| 4. Attendance- | 2.5 marks |

End Semester Examination(Total Marks - 40)

Pattern of Question Paper

Time-- 3 Hours

Maximum Marks—40

1. One essay (200words) out of two from module -1 (Marks- 1x8=8)
2. One essay (200words) out of two from module -2&3 (Marks- 1x8=8)
3. Four out of six questions (80words) from Short Fiction and module-4(Marks- 4x4=16)
4. Eight out of ten short answer questions from modules- 2&3 (Marks-8x1=8)

(Model question paper will be provided later)

XI. 6B11ENG Project

Aims:

- To broaden the perspectives of the students and train them in research writing based on information gathered from outside sources

Objectives:

- To provide students training in documentation and research methodology.
- To foster an understanding of the mechanics of writing.
- To learn to structure information or informed ideas logically and effectively.
- To engage in a focused study of a topic.
- To learn to present and interpret information gathered through an extensive study of a subject.

Course Code	6B11ENG
Title of the Course	Project
Semester Assigned	6
No. of Credits	2
Contact hours/week	1
Total No. of contact hours	18
Core Texts	1.Klarer, Mario. <i>Introduction to Literary Studies</i> . London: Routledge, 2013. 2.MLA Handbook 7 th /8 th Edition

- A Project work with dissertation should be undertaken by all students
- Project work shall be carried out under the supervision of a teacher in the parent department
- The Project work shall be prepared according to the guidelines approved by the University. Two typed copies of the Project report shall be submitted to the HOD two weeks before the commencement of the ESE
- The external evaluation of the Project work shall be carried out at the end of the semester
- Every student has to do the Project work independently. No group Projects are accepted

Evaluation of a Project

- Total marks for Project is 25 (20 external and 5 internal)
- The ESE of the Project work shall be conducted by two external examiners
- Submission of Project Report and presence of the student for viva are compulsory for internal evaluation
- No marks shall be awarded to a candidate if he/she fails to submit the Project Report for external evaluation
- A student shall be declared to pass in the Project Report Course if he/she secures minimum 40% marks of the aggregate and 40% separately for external
- In case a candidate fails, the Project work may be redone and the report may be resubmitted along with subsequent exams
- There shall be no improvement chance

Mark distribution may be done as follows

Internal 5 marks	
Components	Marks
Punctuality	1
Use of data	1
Scheme/organisation of report	2
Viva-voce	1

External 20 marks	
Components	Marks
Relevance of the topic	1
Statement of the objectives	2
Methodology/reference/bibliography	3
Presentation of facts/figures/language style/diagrams etc.	4
Quality of analysis	3
Findings and recommendations	2
Viva-voce	5

A typed Project of not more than 25 pages which is documented according to specifications in the MLA handbook may be submitted by the students on topics/ authors of their choice. Texts and literary pieces already listed in the syllabus may be avoided. The literary/cultural theories that they have imbibed during the course may be applied in the work. The latest MLA Handbook is to be used

(Core Reading Chapter 7 How to Write a Research Paper from Klarer, Mario. *Introduction to Literary Studies*. London: Routledge, 2013.)

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## XII. 6B12ENG Malayalam Literature in Translation

### Aims:

- To draw the attention of the student to the literary talents operating in Kerala today whose work often goes unnoticed in the international marketplace which is preoccupied with English language books.

### Objectives:

- To provide a sense of rootedness and historical continuity.
- To learn to subject the very practice of translation to ideological scrutiny.
- To make possible the critical discussion of texts, literary movements and cultural phenomena in Kerala.
- To provide lively instructive access to the rich and complex works in Malayalam literature.

|                            |                                     |
|----------------------------|-------------------------------------|
| Course Code                | 6B12NG                              |
| Title of the Course        | Malayalam Literature in Translation |
| Semester Assigned          | 6                                   |
| No. of Credits             | 4                                   |
| Contact hours/week         | 5                                   |
| Total No. of contact hours | 90                                  |
| Core Text                  | <i>Goat Days</i> : Benyamin         |



## Course Outline

### Module I Translation Theory (1 hour)

Translation theory to be limited to the following topics – Processes involved in translation- types of translation- problems involved in translation – lack of equivalence – loss and gain in translation

### Module II(1 hour)

1. Translation and Malayalam Literary Sensibility : A Note on How It All Began. P.P. Raveendran
2. Folklore: The Identity of Culture-Dr. M.V. VishnunarayanNamboodiri
3. Introduction to Raveendran, P.P. ,G. S. Jayasree and C. N. Sreekantan Nair. Eds. *In the Shade of the Sahyadri*. New Delhi: OUP, 2013

### Module III – Poetry(1 hour)

1. My Mother Tongue : Vallathol
2. Rathrimazha : SugathaKumari
3. Offering : BalamaniAmmam
4. Those Who Have Lost the Nectar: O.N.V.
5. World Malayali : AyyappaPanikker
6. Unniyarcha and Aaromal : (Vadakkanpattu, trans. Kamala Das)
7. Gandhi and Poetry : Satchidanandan

### Module IV- Fiction (2 hours)

1. *Goat Days* : Benyamin (Trans. Joseph Koyipally)

#### Short Fiction

1. Story of a Time Piece : S.K. Pottekkat
2. Poovambazham : Basheer
3. Black Moon : M.T. Vasudevan Nair
4. Garden of the Antlions : Paul Zacharia
5. Higuira : N.S. Madhavan
6. Marriages are Made in Heaven : K. SaraswathiAmmam.

#### Suggested Reading:

1. Bassnett, Susan and Andre defevre .Eds. *Translation, History and Culture*. London and New York: Pinter, 1990.
2. Bassnett, Susan and Andre defevre .Eds. *Constructing Cultures: Essays on Literary Translation*. Clevedon et al : Multilingual Matters, 1998.
3. Bassnett, Susan and Harish Trivedi. Eds. *Post-Colonial Translation: Theory and Practice*. London and New York: Routledge, 1999.
4. Dasan, M. ,V. Pratibha, et al. *The Oxford India Anthology of Malayalam Dalit Writing*.New Delhi: OUP, 2012.
5. Niranjana, Tejaswini. *Siting Translation: History, Post-Structuralism, and the Colonial Context*. Oxford: University of California Press, 1992.
6. Venuti, Lawrence. Ed. *Rethinking Translation: Discourse, Subjectivity, Ideology*. London and New York: Routledge, 1998.
7. Tharakan, K.M. Ed. *Malayalam Poetry Today: An Anthology*. Thrissur: Kerala SahityaAkademi, 1984
8. Paniker, K.Ayyappa.Ed. *SahityaAkademi Medieval Indian Literature. Vol 3*. Delhi: SahityaAkademi, 1999.

9. Raveendran, P.P. ,G. S. Jayasree and C. N. Sreekantan Nair. Eds. *In the Shade of the Sahyadri*. New Delhi: OUP, 2013

10. *The Ancient Lyre*. Delhi: SahityaAkademi, 2005.

Topics for assignments/ seminars:

The student may submit a translation of not more than 30 typed pages of any of the writers in Malayalam whose works have not yet been translated

### **Guidelines for Evaluation (6B12ENG)**

#### **Internal Evaluation**(Total Marks - 10)

- |                        |           |
|------------------------|-----------|
| 1. Model Examination - | 5 marks   |
| 2. Assignment-         | 1 mark    |
| 3. Viva/seminar-       | 1.5 marks |
| 4. Attendance-         | 2.5 marks |

#### **End Semester Examination**(Total Marks - 40)

#### **Pattern of Question Paper**

Time-- 3 Hours

Maximum Marks—40

1. One essay (200words) out of two from module -2 (Marks- 1x8=8)
2. One essay (200words) out of two from module -4 (Marks- 1x8=8)
3. Four out of six questions (80words) from poetry and module-3 (Marks- 4x4=16)
4. Eight out of ten short answer questions from Poetry and Short Fiction (Marks-8x1=8)

### XIII. 6B13ENG New Literatures in English

#### Aims:

- To initiate students into a discussion of the cultural differences in literary texts produced from the New World and identify different theoretical assumptions and practices in literature.

#### Objectives:

- To introduce the learner to the growth and development of literatures outside Britain and to learn to contest the very location of literature.
- To know a wide range of writing across continents.
- To learn to critique the relations of power in colonial contexts and newly independent states.
- To learn to subject the economic, political, social and cultural axioms of imperialism to a thorough interrogation.
- To learn to construct alternative readings of history.

|                            |                                                                                               |
|----------------------------|-----------------------------------------------------------------------------------------------|
| Course Code                | 6B13NG                                                                                        |
| Title of the Course        | New Literatures in English                                                                    |
| Semester Assigned          | 6                                                                                             |
| No. of Credits             | 4                                                                                             |
| Contact hours/week         | 5                                                                                             |
| Total No. of contact hours | 90                                                                                            |
| Core Texts                 | 1. WoleSoyanka, <i>The Lion and the Jewel</i><br>2. E.R Braithwaite, <i>To Sir, With Love</i> |

## Course Outline

### Module I (1 hour)

1. Decolonising the Mind- NgugiWaThiongo (From *Monuments of Prose* , Delhi: Macmillan, 2008).
2. The Negro Artist and the Racial Mountain- Langston Hughes (From Leitch, Vincent B. Ed. *The Norton Anthology of Theory and Criticism*. London:Norton, 2000).

### Module II Drama (I hour)

*The Lion and the Jewel* : Wole Soyinka

### Module III Fiction( 2 hours)

*To Sir, With Love* : E.R. Braithwaite

### Short Stories:

1. The Wild Buffalo : PiyaseeliWijemanne
2. How We Fled When I Was a Girl : Molly Nungarrayi
3. My Thai Cat : PratimroothaZeng
4. The Man to Send Rain Clouds : Leslie Marmon Silko
5. Dear Life : Alice Munro

### Module IV Poetry (1 hour)

1. Prayer to the Masks : Leopold Senghor
2. Overture : Christopher Okigbo
3. Far Cry from Africa : Derek Walcott
4. Siren Song : Margaret Atwood
5. Shoulders : Naomi Shihab Nye
6. Words : Edwin Thumboo
7. Train Journey : Judith Wright

### Suggested Reading:

1. Achebe, Chinua. *Hopes and Impediments: Selected Essays 1965-1987*. London:Heinemann, 1988.
2. Amuta, Chidi. *The Theory of African Literature*. London: Zed Books, 1989.
3. Ashcroft, Bill, Gareth Griffiths and Helen Tiffin. *Key Concepts in Post Colonial Studies*.
4. Ashcroft, Bill, Gareth Griffiths and Helen Tiffin. *The Emperor Writes Back: Theory and Practice in Post-Colonial Literature*. London:Routledge, 1989.
5. Atwood, Margaret. *Survival: A Thematic Guide to Canadian Literature*. Toronto: Anansi, 1972.
6. Bhabha, Homi K. Ed. *Nation and Narration*. London:Routledge, 1990.
7. Bhabha, Homi K. *The Location of Culture*. London:Routledge, 1994.
8. Braithwaite, Edward Kamau. *History of the Voice: The Development of Nation Language in Anglophone Caribbean Poetry*. London: New Beacon, 1984.
9. Fanon, Frantz. *The Wretched of the Earth*. London:Penguin, 1961.
10. Loomba, Ania. *Colonialism/Postcolonialism*. London: Routledge, 1998.
11. Nair, Chandran. *Developing Creative Writing in Singapore*. Singapore: Woodrose, 1977.
12. Narasimhaiah, C.D. Ed. *Awakened conscience: Studies in Commonwealth Literature*. London:Heinemann, 1978.
13. Nasta, Susheila. Ed. *Writing Across the Worlds: Contemporary Writers Talk*.( Interviews with Wole Soyinka, Chinua Achebe and NgugiWaThiongo)
14. Said, Edward. *Culture and Imperialism*. London:Vintage, 1995.
15. Said, Edward. *Orientalism*. London: Penguin, 1995.

16. Thieme, John. Ed. *The Arnold Anthology of Post-Colonial Literatures in English*. London: Auckland, 1996.

17. Tiffin, Chris and Alan Lawson. *De-scribing Empire: Postcolonialism and Textuality*. London:Routledge.1998.

Writers listed for assignments/ seminars:

Wilson Harris, Patrick White, Eavan Boland, Ezekiel Mphahlele, Flora Nwapa, Armah Awoonor, Ama Ata Aidoo, Mariama Ba, Nadine Gordimer, Doris Lessing, Olive Schreiner, Janet Frame, Keri Hulme, Jean Rhys, Tsitsi Dangarembga, George Lamming, Bapsi Sidhwa, Rukhsana Ahmed, Ravinda Randhawa, David Simon, Hanif Kureishi, Abdul Razak Gurnah, Christina Stead, Samuel Selvon, Ayi Kwei Armah, Louise Bennett, J.M. Coetzee, E.K. Braithwaite, David Dabydeen, Bernadine Evaristo, Stella Franklin, Joseph Furphy, Lorna Goodison, Jackie Kay, Bessie Head. Henry Kendall, Alex L Guma, Henry Lawson, Les A. Murray, Michael Ondaatje, Caryl Phillips, Katherine Susannah Pritchard, Michael Smith.

### **Guidelines for Evaluation (6B13ENG)**

Internal Evaluation(Total Marks - 10)

- |                        |           |
|------------------------|-----------|
| 1. Model Examination - | 5 marks   |
| 2. Assignment-         | 1 mark    |
| 3. Viva/seminar-       | 1.5 marks |
| 4. Attendance-         | 2.5 marks |

End Semester Examination(Total Marks - 40)

#### Pattern of Question Paper

Time-- 3 Hours

Maximum Marks—40

- |                                                                      |                 |
|----------------------------------------------------------------------|-----------------|
| 1. One essay (200words) out of two from module -1                    | (Marks- 1x8=8)  |
| 2. One essay (200words) out of two from module -2&3(novel only)      | (Marks- 1x8=8)  |
| 3. Four out of six questions (80words) from Short Stories and Poetry | (Marks- 4x4=16) |
| 4. Eight out of ten short answers from Short Stories and Poetry      | (Marks-8x1=8)   |

## IVX. 6B14ENG Indian Writing in English

### Aims:

- To introduce the student to the extraordinary range and complexity of contemporary Indian writing in English and to draw attention to issues such as nature, culture and representation.

### Objectives:

- To help the learner to approach Indian Writing in English as a corollary of the momentous contact between India and the Indian ethos on the one hand, and England, the English language and Western culture on the other.
- To help the learner to identify the Indian idiom of Indian Writing in English and the Indian sensibility that animates it.
- To experience the quintessence of this writing, apart from the prevailing tendencies and motivating forces that foreground it.

|                            |                                                                                                                                                                                                                                                                                              |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Course Code                | 6B14NG                                                                                                                                                                                                                                                                                       |
| Title of the Course        | Indian Writing in English                                                                                                                                                                                                                                                                    |
| Semester Assigned          | 6                                                                                                                                                                                                                                                                                            |
| No. of Credits             | 4                                                                                                                                                                                                                                                                                            |
| Contact hours/week         | 5                                                                                                                                                                                                                                                                                            |
| Total No. of contact hours | 90                                                                                                                                                                                                                                                                                           |
| Core Texts                 | 1. A. K. Mehrotra ( <i>Concise History of Indian Literature in English</i> )<br>2. Raveendran, P.P. <i>Texts, Histories, Geographies: Reading Indian Literature</i> . Hyderabad: Orient Black Swan, 2009).<br>3. GirishKarnad, <i>Hayavadana</i><br>4.Anita Desai, <i>Voices in the city</i> |

## Course Outline

### Module I (1 hour)

#### Critical Perspectives on Indian Writing in English

1. Introduction by A. K. Mehrotra ( *Concise History of Indian Literature in English*)

2. Nationalism, Colonialism and Indian English Literature- P.P. Raveendran. (From Raveendran, P.P. *Texts, Histories, Geographies: Reading Indian Literature*. Hyderabad: Orient Black Swan, 2009).

### Module II Drama (1 hour)

*Hayavadana* : GirishKarnad

### Module III Fiction (2 hours)

*Voices in the City* : Anita Desai.

### Short Stories

1. India- A Fable : Raja Rao (From *The Meaning of India*)
2. Liar : Mulk Raj Anand
3. Fellow Feeling : R. K. Narayanan
4. Unfaithful Servants : ManjulaPadmanabhan
5. Remains of the Feast : Gita Hariharan

### Module IV Poetry (1 hour)

1. Stone Goddess : Aurobindo
2. Family Dinner : Dom Moraes
3. Railway Clerk : Nissim Ezekiel
4. TajMahal : R.Parthasarathy
5. The Abandoned British Cemetery at Balasore, India : JayantaMahapatra
6. Last of the Princes : A. K. Ramanujan
7. How to Tame a Pair of New Chappals : GopalHonnalgere

### Suggested Reading:

1. Abidi, S.Z. H. *Studies in Indo-Anglian Poetry*. Bareilly:Prakash Book Depot, 1979.
2. Asnani, Shyam M. *Critical Reponse to Indian English Fiction*. New Delhi, Mittal, 1986.
3. Bhatta, Krishna S. *Indian English Drama: A Critical Study*. New Delhi: Sterling, 1987.
4. Bhatnagar, O.P. Ed. *Studies in Indian Poetry in English*. Jaipur: RachanaPrakashan, 1981.
5. Desai, S.R. and G.N. Devy. *Critical Thought: An Anthology of 20th Century Indian English Essays*. New Delhi: Sterling, 1986.
6. King, Bruce. *Modern Indian Poetry in English*. Delhi: OUP, 1987.
7. LAL, P. Ed. *Modern Indian Poetry in English: An Anthology and a Credo*. Calcutta: Writers' Workshop, 1969.2nd expanded edition 1971.
8. Lall, E.N. *The Poetry of Encounter: Dom Moraes, A. K. Ramanujan and Nissim Ezekiel*. New Delhi: Sterling, 1983.
9. Myles, Ashley, E. Ed. *An Anthology of Indo-Anglian Poetry*. New Delhi, Mittal, 1991.
10. Naik, M. K. Ed. *Perspectives on Indian Poetry in English*. New Delhi: Abhinav, 1984.
11. Narasimhaiah, C.D. Ed. *Makers of Indian English Literature*. New Delhi: Pencraft, 2000.
12. Peeradina, Saleem. Ed. *Contemporary Indian Poetry in English: An Assessment and Selection*. Mumbai:Macmillan 1972.
13. Prasad, Madhusudan, Ed. *Indian English Novelists: An Anthology of Critical Essays*. New Delhi: Sterling, 1982.

Writers/Topics for assignments/ seminars:

Henry Derozio, Greece ChunderDutt, Rabindranath Tagore, Toru Dutt, Sarojini Naidu, Nirad C. Chaudhuri, Vikram Seth, ChetanBhagat, ArvindAdiga, AdilJussawalla, K. N. Daruwallah, R. Parthasarathy, Kamala Das, A.K. Mehrotra, ArunKolatkarr, SaleemPeeradina, ManoharShetty, ArunKolatkarr, Shiv K. Kumar, G. S. Sharat Chandra, AnandThakore, DilipChitre, JeetThayyil, Eunice De Souza, Melanie Silgado, MamtaKalia, GauriDeshpande, Mamang Dai, Agha Shahid Ali, Alan Sealy, Kiran Desai, Sujata Bhatt, MeenaKandaswamy, TishaniDoshi, Bharati Mukherjee, ChitraDivakaruni, Gita Hariharan, ShashiDeshpande, Salman Rushdie, ImtiazDharkar, Srinivas Rayaprol.

The aesthetics of Indian Writing in English, Dalit poets, the Question of Modernity, Indianness, the Indian sensibility, Cultural pressures on the Indian writer in English, Diaspora writers, Postcolonialism and the Indian Writer.

### **Guidelines for Evaluation (6B14ENG)**

Internal Evaluation(Total Marks - 10)

- |                        |           |
|------------------------|-----------|
| 1. Model Examination - | 5 marks   |
| 2. Assignment-         | 1 mark    |
| 3. Viva/seminar-       | 1.5 marks |
| 4. Attendance-         | 2.5 marks |

End Semester Examination(Total Marks - 40)

#### Pattern of Question Paper

Time-- 3 Hours

Maximum Marks—40

- |                                                                      |                 |
|----------------------------------------------------------------------|-----------------|
| 1. One essay (200words) out of two from module -1                    | (Marks- 1x8=8)  |
| 2. One essay (200words) out of two from module -2&3(novel only)      | (Marks- 1x8=8)  |
| 3. Four out of six questions (80words) from Short Stories and Poetry | (Marks- 4x4=16) |
| 4. Eight out of ten short answers from Short Stories and Poetry      | (Marks-8x1=8)   |
- (Model question paper will be provided later)



## VX. 6B15ENG Film Studies

### Aims:

- The course aims at enabling the undergraduate students to discuss film theories at a basic level and prepare them to a higher level of understanding and appreciation of contemporary films.

### Objectives:

- To equip the undergraduate student with a historical perspective of world cinema.
- To accustom the student to a wide range of cinematic styles and techniques from canonical phases of cinematic history.
- To critically view the nature of representation on screen of class, race, gender, ethnicity and sexuality.
- To create a lively atmosphere of cinema debate in the classrooms with continuous use of audio-visual clippings from representative films based on the wide spectrum of film theories, styles and movements laid out in the four modules.

|                            |                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Course Code                | 6B15NG                                                                                                                                         |
| Title of the Course        | Film Studies                                                                                                                                   |
| Semester Assigned          | 6                                                                                                                                              |
| No. of Credits             | 4                                                                                                                                              |
| Contact hours/week         | 5                                                                                                                                              |
| Total No. of contact hours | 90                                                                                                                                             |
| Core Texts                 | 1. Susan Heyward : <i>Key concepts in Film Studies</i><br>2. Annie Villarejo: <i>Film , The Basics</i><br>3. Andrew Dix: <i>Beginning Film</i> |

## Course Outline

### Module I (1 hour)

#### Module I (for Essay Questions)

The Beginnings of Cinema—Early Cinema (The Silent Era)—Classical Hollywood Cinema, Contemporary Hollywood Cinema—Early Soviet Cinema—French New Wave Cinema—Italian Neo-realism—Latin American Cinema—Japanese, Iranian and Korean Cinema—Cinema in India (Hindi and Malayalam Cinema)

Introduction to the film theories of Sergei Eisenstein, Andre Bazin, Auteur theory, Christian Metz and Laura Mulvey.

#### Module 2 (Short Answer Questions)

**Film Language:** The Basic Building Blocks of Film

**Mise-en-scene:** Lighting, Costume, Setting

**The Shot:** The Scale of Shot, Establishing Shot, Shot-Reverse-Shot, Tracking Shot, Framing, Composition, Camera Angle—Tilt, Pans and Rolls—Focus.

**Editing:** Montage School, Chronological Editing, Parallel Editing, Continuity editing, Jump cuts, Match cuts, Fade out, Dissolve, Iris, Wipe

**Sound:** Diegetic, Extra-diegetic, Music, Speech.

**Colour:** Black and white, Eastman, Technicolor

Production, distribution and reception of films; Censorship.

#### Module 3 (Paragraph Questions)

The Major genres: Documentary, Narrative, Avant-garde, Feature films, Short Films, Thriller, Melodrama, Musical, Horror, Western, Fantasy, Animation, Film noir, Expressionist, Historical, Mythological, Road movies.

#### Module 4 (Essays on 1, 2 and 5)

##### Case Studies of Classic Cinema (Films to be screened)

- |                        |   |                                     |
|------------------------|---|-------------------------------------|
| 1. Battleship Potemkin | : | 1925 Silent Cinema, Montage (Essay) |
| 2. Bicycle Thieves     | : | 1948 Italian Neo Realism (Essay)    |
| 3. Breathless          | : | 1960 French New Wave                |
| 4. Citizen Kane        | : | 1941 Hollywood Classic              |
| 5. ShatranjKeKhilari   | : | 1977 Indian Classic                 |
| 6. Kodyettam           | : | 1977 Malayalam Classic (Essay)      |

Following films may be used for Seminar Presentation/assignments:

- |                       |   |                                                 |
|-----------------------|---|-------------------------------------------------|
| 1. The Godfather      | : | Francis Ford Coppola (1972 American Crime Film) |
| 2. The Great Dictator | : | Charlie Chaplin (1940 American Comedy Drama)    |
| 3. Sholay             | : | Ramesh Sippy (1975 Hindi Action Adventure Film) |
| 4. Bandit Queen       | : | SekharKapur (1994 Indian Film)                  |

5. Thelma and Louise : Ridley Scott (1994 American Road Movie)
6. Fire : Deepa Mehta (1996 Hindi movie)
7. Escape to Victory : John Huston (1981 Football Movie)
8. Psycho : Alfred Hitchcock (1940 Psychological Thriller)
9. Buddha Collapsed out of Shame : Hana Makhmalbaf (2007 Iranian Film)
10. The Bow : Kim Ki Duk (2005 Korean Movie)
11. The Cup : KhyentseNorbu (1999 film)
12. Nirmalyam : M.T. Vasudevan Nair (1973 Malayalam film)
13. Apocalypse Now : Francis Ford Coppola (1979 Epic War Film)
14. The Lion King : Roger Allers and Rob Minkoff (1994 Animation Movie)
15. What is that? : ConstantinPilavios (2007 Greek Short Film)
16. Fahrenheit 9/11 : Michael Moore (2004 Documentary Film)
17. Mahabharat : (2013 Animated Indian Mythological drama film)
18. Peeping Tom : Michael Powell (1960 American Voyeuristic Film)
19. Paruthiveeran : Ameer Sultan (2007 Tamil film)
20. Traffic : Rajesh Pillai (2011 New Generation Malayalam movie)

#### Reading List

1. Bazin, Andre: What is Cinema? Vol. 1 and Vol. 2
2. Hyward, Susan. Key concepts in Cinema Studies.
3. Laura Mulvey: Visual Pleasure and Narrative Cinema (1975) Originally Published - Screen 16.3 Autumn 1975 pp. 6-18
4. Metz, C. Film Language: A Semiotics of the Cinema.
5. Sergei Eisenstein: Film Form: Essays in Film Theory.
6. Andrew, J D. Inrtoduction to Major Film Theories.
7. Bill Nichols: Engaging Cinema: An Introduction to Film Studies.
8. Lapsley, R and Westlake, M. Film Theory: An Introduction.
9. Ravi S Vasudevan., ed. Making Meaning in Indian Cinema.
10. Jill Nelmes: Introduction to Film Studies (5the edn.)

#### FURTHER READING

1. R. Stam et al: New Vocabularies in Film Semiotics
2. David A. Cook: A History of Narrative Film.
3. Rajadhyaksha, Ashish and Paul Willemen. ed. Encyclopedia of Indian Cinema.
4. Hamid Dabashi: Close Up: Iranian Cinema, Past, Present, and Future
5. John King, Magical Reels: A History of Cinema in Latin America.

#### Readings from Within.

1. J. Monaco: How to Read a Film.
2. Leo Braudy& Marshall Cohen. (Eds.) Film Theory and Criticism.
3. David Sterrit: The Films of Alfred Hitchcock.
4. Geoffrey Nowell Smith: The Oxford History of World Cinema.
5. James Monaco. How to Read a Film: The Art, Technology, Language.
6. History and Theory of Film and Media. Oxford: OUP, 1981.
7. Mike Wayne: Political Film: The Dialectics of Third Cinema.
8. Pete Bondanella: Italian Cinema: From Neorealism to the Present.
9. Peter Graham (ed.): The French NewWave

## CYBER RESOURCES

1. <http://www.afi.com>
2. <http://www.imdb.com>
3. <http://www.bfi.org.uk>
4. <http://www.film-philosophy.com>
5. <http://filmstudiesforfree.blogspot.in>
6. <http://www.nfaipune.gov.in>
7. <http://www.bollywoodvillage.com>
8. [www.nfdcindia.com](http://www.nfdcindia.com)
9. <http://www.soas.ac.uk>

### **Guidelines for Evaluation (6B15ENG)**

#### Internal Evaluation(Total Marks - 10)

- |                        |           |
|------------------------|-----------|
| 1. Model Examination - | 5 marks   |
| 2. Assignment-         | 1 mark    |
| 3. Viva/seminar-       | 1.5 marks |
| 4. Attendance-         | 2.5 marks |

#### End Semester Examination(Total Marks - 40)

#### Pattern of Question Paper

Time-- 3 Hours

Maximum Marks—40

- |                                                       |                 |
|-------------------------------------------------------|-----------------|
| 1. One essay (200words) out of two from module -1     | (Marks- 1x8=8)  |
| 2. One essay (200words) out of two from module -4     | (Marks- 1x8=8)  |
| 3. Four out of six questions (80words) from module- 3 | (Marks- 4x4=16) |
| 4. Eight out of ten short answers from module- 2      | (Marks-8x1=8)   |

(Model question paper will be provided later)

# SYLLABI FOR ELECTIVES IN CORE COURSES IN ENGLISH LANGUAGE AND LITERATURE

(2014 ADMISSION ONWARDS)

Three Courses are offered in this segment. One of them may be chosen by the department

## VIX. 6B16(1)ENG World Literature in Translation

### Aims:

In an age of globalization, the category of world literature is increasingly important to academic teaching and research. The paper will persuade the student to comprehend the world as a whole, and think in terms of a universal cultural convergence by considering world literatures not as a canon of texts but as a mode of circulation and reading.

### Objectives:

- To draw the attention of the learner to universally significant cultural moments of history.
- To learn to connect to literatures across the globe and engage in literary and cross-cultural inquiry, by reading non-canonical and less known literatures from across the globe.
- The student will learn to identify universal themes prevalent in literature of all cultures.
- The student will learn the significance of national literatures in an era of globalization, assess gender and cultural formations across time and engage in experimental approaches to literature and culture.

|                            |                                 |
|----------------------------|---------------------------------|
| Course Code                | 6B16(1)ENG                      |
| Title of the Course        | World Literature in Translation |
| Semester Assigned          | 6                               |
| No. of Credits             | 4                               |
| Contact hours/week         | 4                               |
| Total No. of contact hours | 72                              |
| Core Texts                 |                                 |

## Course Outline

### Module I (1 hour)

1. Transference, Transliteration and Transcreation.
2. Translation and Comparative Literature.

### Module II Drama (I hour)

1. *The Caucasian Chalk Circle* : Bertolt Brecht.
2. *The Inspector General* : Anton Chekhov (One act play)

### Module III Novel (I hour)

*Embers* : Sandor Marai

### Module IV Short Stories and Poetry (I hour)

1. The Last Lesson : Alphonse Daudet
2. Hill Bred : Aarreph El-Khoury
3. Children and Old Folk : Ivan Cankar
4. ZireBuzette : Maurice des Ombriaux
5. One of These Days : Gabriel Garcia Marquez

### Poetry

1. Ithaca : Constantine Cavafy
2. You Who Never Arrived : Rainer Maria Rilke
3. Rocking : Gabriela Mistral
4. If I Wrote It was Because : Antonella Anedda
5. Gifts : Shu Ting
6. To My Mother : Mahmoud Darwish

### Suggested Reading:

1. Arane, R. Victoria. *The Facts on File Companion to World Literature*. New York: Facts on File, 2008.
2. Bassnett, Susan and Andre Leffevere .Eds. *Translation, History and Culture*. London and New York: Pinter, 1990.
3. Bassnett, Susan and Andre Leffevere .Eds. *Constructing Cultures: Essays on Literary Translation*. Clevedon et al : Multilingual Matters, 1998.
4. Bassnett, Susan and Harish Trivedi. Eds. *Post-Colonial Translation: Theory and Practice*. London and New York: Routledge, 1999.
5. Behdad, Ali and Dominic Thomas. Ed. *A Companion to Comparative Literature*. Oxford: Blackwell, 2011.
6. *Comparative Literature and Culture*. 13.5(2011).
7. Damrosch, David. *How to Read World Literature*. Oxford: Blackwell, 2009.
8. D'Haen, Theo. *The Routledge Concise History of World Literature*. New York: Routledge, 2012.
9. D,Haen, Theo, David Damrosch and Djelal Kadir. Ed. *The Routledge Companion to World Literature*. New York: Routledge, 2012.
10. Marquez, Gabriel Garcia . *Collected Stories: Gabriel Garcia Marquez*. Trans. Gregory Rabassa and J. S. Bernstein. New Delhi: Penguin, 1996.
11. Mitra, Arpan. Ed. *Great Short Stories of the World*. New Delhi: Maple Press, 2013.
12. *Journal of Literature and Aesthetics: Special Issue on World Poetry Today*. Vol.1. No.1 July-December 2001.

## VIX. 6B16(2)ENG Indian Writing in Translation

### Aims:

- To introduce the student to the multiple literary communities operating in India today and the extraordinary profusion of literary talents working in many dialects and languages.

### Objectives:

- To foreground the idea of an Indian literary canon that is made up of multiple cultural practices and temporalities.
- To extend cross-cultural understanding.
- To make possible the critical discussion of multilingual and multicultural phenomena.
- To understand the literary scene of India which is vital, diverse and evolving.

|                            |                                                                                                                                  |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Course Code                | 6B16(2)ENG                                                                                                                       |
| Title of the Course        | Indian Writing in Translation                                                                                                    |
| Semester Assigned          | 6                                                                                                                                |
| No. of Credits             | 4                                                                                                                                |
| Contact hours/week         | 4                                                                                                                                |
| Total No. of contact hours | 72                                                                                                                               |
| Core Texts                 | 1. BadalSircar, <i>EvamIndrajit</i><br>2. Ashokamitran, <i>Mole!</i> (Trans. N.Kalyan Raman),<br>Hyderabad:Orient Longman, 2005. |

## Course Outline

### Module I (1 hour)

#### Critical Perspectives on Indian Writing in Translation

1. Tribal Language and Literature: The Need for Recognition- Mahashweta Devi (From *Dust on the road: The Activist Writing of Mahashweta Devi*)
2. Decolonization and the Dynamics of Translation: An Essay in Historical Poetics- P.P. Raveendran.

### Module II Drama (1 hour)

*EvamIndrajit* : BadalSircar

### Module III Fiction (1 hour)

*Mole!* : Ashokamitran (Trans. N.Kalyan Raman).

### Short Fiction

1. Aazhvar : Era Murugan
2. Returning Home : GulamMuhammed Sheikh
3. A Ten Day Fast : HarishankarParsai
4. The Most Beautiful Picture in the World : Sunil Gangopadhyaya
5. Maami : AjeetKaur

### Module IV Poetry (1 hour)

1. If There are no Flowers : FiraqGorakhpuri
2. The Character I Created : ChandrashekharKambar.
3. Old Age : From Dhammapada c. 4C.E./5 C.E.
4. This Pain Has Driven me Mad : Mira Bai
5. What shall We Sell Next? : Vijayalakshmi
6. My Goa : R. V. Pandit
7. Flight : Robin Ngangom

### Suggested Reading:

1. Brough, John. Ed. *Poems from the Sanskrit*. Harmondsworth:PUK, 1968.
2. Devi, G.N. *After Amnesia: Tradition and Change in Indian Literary Criticism*. Hyderabad: Orient Longman, 1995.
3. De Souza, Eunice and Melanie Silgado. Ed. *These My Words: The Penguin Book of Indian Poetry*. New Delhi: Penguin, 2012.
4. Dharwadker, Vinay and A.K.Ramanujan. Ed. *The Oxford Book of Modern Indian Poetry*. Delhi: OUP, 1994.
5. Mukherjee, Meenakshi and Nissim Ezekiel. Ed. *Another India*. Delhi:PBI, 1990.
6. Paniker, K.Ayyappa.Ed. *SahityaAkademi Medieval Indian Literature. Vols 3*. Delhi: SahityaAkademi, 1999.
7. Raveendran, P.P. *Texts, Histories, Geographies: Reading Indian Literature*. Hyderabad: Orient Black Swan, 2009.
8. Sharma, T.R. S. Ed. *Ancient Indian Literature*. Delhi: SahityaAkademi, 1999.
9. Tharakan, K.M. Ed. *Malayalam Poetry Today: An Anthology*. Thrissur: Kerala SahityaAkademi, 1984
10. *The Ancient Lyre*. Delhi: SahityaAkademi, 2005.



Writers/Topics for assignments/ seminars:

MaheJabeen(Oriya), J.P. Das(Oriya), BaladevRath (Oriya), Susmita Bhattacharya, (Bangla)  
SitanshuYashashchandra (Gujarati) Shah MadhoLal Husain (Punjabi) HabbaKhatoon (Kashmiri)  
KuttiRevathi (Tamil), Jayakanthan (Tamil) Ashokamitran (Tamil)Shah Abdul Latif (Sindhi), Vinod  
Kumar Shukla (Hindi), Faiz Ahmed Faiz (Urdu),KunwarNarain (Hindi), LakhmiKhilani (Sindhi),  
Nirala (Hindi), ChandrashekharaPatil (Kannada)G. S. Shivarudrappa (Kannada),NatwarlalPandya  
Ushnas (Gujarati) SubramaniaBharati (Tamil), Akkamahadevi (Tamil), Basavanna (Kannada),  
PravinGadhvi (Gujarati) MrinalPande (Hindi), Harindra Dave (Gujarati), JyotirmoyDutta  
(Bangla)Sarala Das (Oriya), Markanda Das, (Oriya), BishnuDey(Bangla) , Indira Sant  
(Marathi)Bullah Shah (Punjabi Sufi) ArunKamble (Marathi), UmaShankar Joshi  
(Gujarati)GovindhadasJha (Maithili) AnuradhaMahapatra ( Bangla) PratibhaNandakumar(Kannada),  
Chandrakanti (Tamil), SurendraPrakash (Urdu) Gita Chattopadhyay (Bangla), Mahadevi Varma (Hindi),  
Amrita Pritam (Punjabi), KanchanKuntala Mukherjee (Bangla) ,Ram Basu (Bangla),  
SundraRamaswami (Tamil) SitakantaMahapatra (Oriya), Krishna Sobti (Hindi), RaghuvirSahay  
(Hindi), PrayagShukla (Hindi), Ambai (Tamil), VihayChauhan (Hindi).

Poems, folksongs, Oral narratives, Sanskrit poetry, Bhakti poetry, Urdu poetry,Marathi poetry , Dalit  
poetry, Nativism.

## VIX. 6B16(3)ENG Writing for Media

### Aims:

- To introduce students to the process of writing for media
- To enable students to understand the different requirements demanded by different mass media.
- To equip students with the required skills/ knowledge to write professionally for mass media.

### Objectives:

- On completion the student will be able to write for the visual and print media.
- The student will also be equipped to see the differences in writing for different types of media.
- The student will be enabled to identify media as deeply involved in social construction.

|                            |                   |
|----------------------------|-------------------|
| Course Code                | 6B16(3)ENG        |
| Title of the Course        | Writing for Media |
| Semester Assigned          | 6                 |
| No. of Credits             | 4                 |
| Contact hours/week         | 4                 |
| Total No. of contact hours | 72                |
| Core Texts                 |                   |

## Course Outline

### Module I – Print Media (2 hours)

- a) Introduction to Print Media – role in social construction - Audience for the News - Feature Writing and Article Writing - Angle – Structure – Organisation
- b) Newspaper Writing: Editorials, Letters to the Editor, Book and Film reviews, Interviews  
Lead: datelines , Credit-line , Bylines, Nut-graph , Headlines, Oped Pieces, ads
- c) Editing: Grammar – Punctuation – Subbing – Proof-reading – Freelancing
- d) Writing for Magazines: Action – Angle – Anecdote

### Module II – Electronic Media (1 hour)

- a) Radio: as a Mass Medium, Radio Skills, Broadcast Writing, Broadcast Terms, Scripting for Radio, Story Structure, Lead, Body, Ending, Writing, Radio News and Features, Programmes for Radio (Features, News, Interviews, Skits, Music Programmes, etc.)  
Practical – Planning a Newscast – Radio Jockeying
- b) Television : Television as a Mass Medium – Television Skills – Scripting for TV  
Programmes for TV (Features, News, Interviews, Music Programmes, ads etc.) Practical – Anchoring, Interviewing
- c) Film; Fundamentals of Film Scripting, Screenplay and Production, Documentary Film, News Reel.  
Practical:  
Writing Short Screenplays, Film Reviews.

### Module III – Digital Media (1hour)

- a) Kinds of Digital Media: E-book – E-magazine – E-journal – E-newspaper – Internet – World Wide Web
- b) Writing for Digital Media: Web Writing - Technical Writing – Blogging.
- c) Caption Writing – Copy Writing/Content Writing – Headline, Blurb, Lead - Digital  
Correspondence – Digital Editing Assignments in Technical Writing, Web Writing,  
Blogging, advertisement writing.

## 4. Reading List

1. Writing for the Mass Media (Sixth edition). James Glen Stovall Pearson Education, 2006
2. Basic News Writing Melvin Menchar William. C.Brown Co., 1983
3. Writing and Reporting News: A Coaching Method Carole Rich Wadsworth/ Thomson Learning, 2003
4. News Writing & Reporting James A Neal & Suzane S Brown Surjeeth Publications,
5. Broadcast News Writing, Reporting & Production Ted White Macmillan
6. An Introduction to Digital Media Tony Feldman (Blueprint Series) 1996
7. Advertising Ahuja & Chhabra Surjeeth Publications, 1989
8. The Screenwriter's Workbook Syd Field Dell Publishing, 1984
9. E-Writing Dianna Boother Macmillan, 2008
10. Mass Communication Theory Denis Mcquail Vistaar Publications, 2007
11. Writing and Producing News Eric Gormly Surjeet Publications, 2005
12. A Crash Course in Screenwriting David Griffith Scottish Screen, 2004

13. Digital Media: An Introduction Richard L Lewis Prentice Hall
14. The Art of Editing the News Robert.CMcGiffort Chilton Book Co., 1978
15. Digital Media Tools Dr.Chapman Nigel (Paperback - 26 Oct 2007)
16. News reporting and Editing K.M Srivastava Sterling Publications
17. The News Writer's Handbook: an Introduction to Journalism M.L Stein, , Paterno, Susan.FSurjeeth Publications, 2003
18. The Associated Press Style Book and Libel Manuel Norm The A.P, 1994
19. The TV Writer's Workbook : A Creative Approach to Television Ellen Sandler Delta, 2007
20. Understanding Journalism Lynette Sheridan Burns Vistaar Publications, 2004
21. Media and Society in the Digital Age Kevin Kawamoto Pearson Education, 2002
22. Media in the Digital Age J.V Pavlik (Paperback - 1 May 2008)
23. Creative Writing: A Beginner's Manual. Ed. AnjamnaNeiraDev et.al. Pearson Longman 2009 Pages 177-205

#### 5. Web Resources

<http://www.learner.org/resources/series44.html>

<http://www.bedfordstmartins.com/catalog/static/bsm/mediawriting/>

<http://www.scottishscreen.com>

<http://www.subtle.net/empyre/>

<http://www.billseaman.com>

<http://www.inplaceofthepage.co.uk>

<http://www.desvirtual.com>

<http://www.brueckner-kuehner.de/block>



## **VIIX. 5D01ENG English for Competitive Examinations**

### **Aims:**

- To familiarise students with the language items required to take competitive examinations at various levels and to equip them with the methodology of approaching the said items. different mass media.

### **Objectives:**

- To acquaint the students with the basics of English grammar
- To enable the students to enrich their vocabulary
- To provide opportunities for the students to improve their listening and reading comprehension skills
- To familiarise the students with the questions that are commonly asked in various interviews and to help them frame the desirable responses

|                            |                                      |
|----------------------------|--------------------------------------|
| Course Code                | 5D01ENG                              |
| Title of the Course        | English for Competitive Examinations |
| Semester Assigned          | 5                                    |
| No. of Credits             | 2                                    |
| Contact hours/week         | 2                                    |
| Total No. of contact hours | 36                                   |
| Core Texts                 |                                      |

## Course Outline

### Module 1 Basic Grammar

- a) Concord
- b) Articles
- c) Modals
- d) Tenses
- e) Prepositions
- f) Question Tags
- g) Punctuations

### Module 2

- a) Error Correction
- b) Vocabulary Test
- c) Rearrangement of words to form meaningful sentences
- d) Idiomatic Expressions
- e) Comprehension Passages
- f) Phrasal Verbs
- g) Collocation

\*\*\*\*\*

**Kannur University**  
**Model Question Paper**  
5B07ENG : Modern Critical Theory

Time : 3 hours

Maximum Marks : 40

I. Write an essay of about 200 words on any one: (1x8=8 marks)

1. How did Women's writing attain its present status? Briefly describe the historical developments.
2. Define Postcolonialism and explain the features of Postcolonial criticism.

II. Write an essay of about 200 words on any one: (1x8=8 marks)

3. In the essay "From Columbus to Tendulkar", why does the author say that the grammar of games remains fairly secure and unassailable?
4. How does Chinua Achebe prove through his essay that the image of Africa projected in Conrad's Heart of Darkness is biased?

III. Answer any six in not more than 80 words : (6x 4 = 24 marks)

5. How does Anglo American feminism differ from French feminism?
6. What are the peculiarities of Eurocentrism?
7. What are the major differences between Structuralism and Poststructuralism?
8. Define Canon
9. Baudrillard's classification of four stages of signs.
10. What is 'Gaze'?
11. Analyse Edward Said's Postcolonial criticism of Jane Austen's *Mansfield Park*.
12. Attempt Deconstruction of Dylan Thomas' poem "A refusal to mourn the death, by fire, of a child in London".

**Kannur University**

**Model Question Paper**

5B08ENG: Drama: Theory and Literature

Time : 3 hours

Maximum Marks : 40

I. Write an essay of about 200 words on any one of the following: (1x8=8 marks)

1. 'Macbeth' as a Shakespearean tragedy
2. The supernatural elements in the play 'Macbeth'

II. Write an essay of about 200 words on any one of the following: (1x8=8 marks)

3. How does Cleopatra evolve from an impetuous child to a ruthless despot in Shaw's *Caesar and Cleopatra*?
4. Comment on *The Emperor Jones* as an Expressionist play.

III. Answer any two of the following in not more than 80 words : (2x 4 = 8 marks)

5. Restoration comedy.
6. Medieval drama
7. Plot

IV. Annotate any two of the following: (2x 4 = 8 marks)

8. "Fair is foul , and foul is fair:Hover through the fog and filthy air"
9. "Threescore and ten I can remember well : Within the volume of which time I have seen Hours dreadful and thing strange; but this sore nightHath trifled former knowings"
10. "Royalty, ftatateeta ,lies not in the barge but in the queen"

V. Answer eight of the following questions in one or two sentences. (8x 1 = 8 marks)

11. What is Duncan's gift to lady Macbeth?
12. How can a false heart be hidden , according to Macbeth ?
13. Why were Malcom and Donalbain suspected of having caused the murder of their father?
14. What is the one thing that Caesar is touchy about,and is being constantly reminded?
15. Who is Cleopatra referring to when she says, 'oh, you must not say common, earthly things about him, for I love him. He is a God'?
16. Who was Theodotos?
17. Who is the first character to appear on the stage in the play 'The Emperor Jones'?



18. What does smithers talk to the old woman about in the first scene in the play *Emperor Jones*?
19. What are the two unnatural incidents Ross speaks of ?
20. What is the difference between Caesar's and Brittanus' forms of expression?

**Kannur University**  
**Model Question Paper**  
5BO9ENG - Studies in Fiction

Time : 3 hours

Maximum Marks : 40

I. Write an essay of about 200 words on any one of the following: (1x8=8 marks)

1. Write a critical evaluation of *The Rocking Horse Winner* bringing about its pathos.
2. Give a comparative assessment of the character of Peter Morton and Francis Morton in *The End of the Party*.

II. Write an essay of about 200 words on any one of the following: (1x8=8 marks)

3. *Life of Pi* is an epic journey of survival and faith in God as told through the eyes of a teenager. Elucidate.
4. Examine *Wuthering Heights* as a story of love and revenge.

III. Answer any four of the following in not more than 80 words: (4x 4 = 16 marks)

5. The commotion following the entry of the cops into Thurber's house.
6. Humour in *The Invalid's Story*.
7. How are magic realist novels different from realistic novels?
8. Stream of Consciousness as a narrative technique
9. Utopian fiction and Science fiction
10. Theme of *Wasp's Nest*.

IV. Answer **eight** of the following in **one or two** sentences : (8x 1 = 8 marks)

11. What is Madame Roubere's remark about her sister's romance?
12. What is Herriot's advice to Mrs. Pumphrey about dog diet?
13. What do the boys of Miguel Street retrieve from Miss Hilton's yard?
14. How did the narrator in *The Invalid's Story* lose his health?
15. What is mother's reply to Francis' complaint of his fear of darkness?
16. What do you mean by a reflexive novel? Give an example.
17. Name two epistolary novels of the eighteenth century.
18. What is a parable? Give an example.
19. What was the full name of Pi and why did he change it into Pi?
20. What was Heathcliff's intention behind the marriage of Linton and young Catherine?

Kannur University

## Model Question Paper

5B1OENG – Women’s Writing

Time : 3 hours

Maximum Marks : 40

I. Write an essay of about 200 words on any one of the following: (1x8=8 marks)

Simone de Beauvoir’s *The Second Sex* is an examination of the gender hierarchy within human society. Discuss.

*The Art of Living* is an enquiry into the condition of women in Indian society. Analyse.

II. Write an essay of about 200 words on any one of the following: (1x8=8 marks)

Jason brings his own downfall in *Medea*. Illustrate.

*The Colour Purple* chronicles the struggles of several black women. Discuss

III. Answer any four of the following in not more than 80 words: (4x 4 = 16 marks)

How does the poet revalue the gesture of weeping in the poem *An Ancient Gesture*?

Comment on how the poet re-evaluate the nature and purpose of women’s household chores in the poem *Women’s Work*.

Analyse the theme of life vs art in the poem *Aunt Jennifer’s Tigers*.

Explain and justify the title “Thamasha”.

Analyse the re-visioning of the story of Shakuntala in Vaidehi’s “An Afternoon with Shakuntala”

Describe the past and present life of Aunt Georgiana.

IV. Answer **eight** of the following **in one or two** sentences : (8x 1 = 8 marks)

What was the gift send by Medea to the new bride?

Who discovers the body of Mr. Wright?

Which characters represent the law in *Trifles*?

Who offered the help to Medea after being exiled?

Name the author of the Greek revenge drama *Medea*.

Who killed Minnie’s canary?

What is the real name of Squeak?

To whom does Celia write letters?

Give the names of two women characters who are presented in the poem *Dignity*.

Who is the stepfather of Shakuntala?

### **Guidelines for Evaluation(5D01ENG)**

Internal Evaluation (Total marks 5)

1. Class test 2.5
2. Attendance 2.2

End Semester Examination (Total Marks 20)

#### **Pattern of Question Paper**

Time – 2 Hours

Maximum Marks --- 20

1. One out of two questions from Module 1 (Marks -1x5=5)
2. One out of two questions from Modules 1 and 2 (Marks -1x3=3)
3. 12 grammar questions from all Modules (Marks -12x1=12)

#### **Model Question Paper\**

#### **5D01 ENG : English for Competitive Examinations**

Time : 2 hours

Maximum marks : 20

I. Answer any one of the following questions in not more 150 words. (1x5=5 marks)

1. Explain the present tense with their important uses.
2. Define Modal auxiliaries. Mention the important uses of two of them.

II. Answer any one of the following questions. (1x3=3 marks)

3. Comprehension passage, with questions.
4. Punctuate the following: The Shepherd finding his flock destroyed exclaimed I have been rightly served why did I trust my sheep to a wolf.

III. Answer the following questions according to the directions provided. (12x1=12 marks)

5. You are free, \_\_\_\_\_ (Add appropriate question tag)
6. Why don't you go \_\_\_\_\_ your brother? (Fill in the blanks with the suitable preposition)
7. Neither you nor he \_\_\_\_\_ to blame. (Use the correct form of the verb 'be')
8. \_\_\_\_\_ last Chapter of \_\_\_\_\_ book is very interesting (Apply correct articles, if necessary)
9. He have been ill since last week (Correct the sentence if necessary)
10. Give one word for the following phrases: a) One who is all powerful b) One who known several languages.

11. Give the meanings of the following idioms: a) a bolt from the blue b) be on cloud nine
12. Give the meanings of the following phrasal verbs: a) give up b) move on
13. Rearrange the following jumbled words to form a meaningful sentence: People  
the through travelled local I meeting village the.
14. Choose the appropriate synonym of the italicized word: The judge's Verdict was *fair*.  
(Pale, carnival, unbiased)
15. Did you listen to the whether report? (Make correction, if necessary)
16. Fill the blank with the correct collocation:  
The doctor ordered him to take \_\_\_\_\_ exercise (daily, continuous, regular)

**KANNUR UNIVERSITY**  
(Abstract)

*BSc Computer Science Programme - Revised Scheme & Syllabus of Core, Complementary and Open Courses under Choice Based Credit Semester System for Under Graduate Programme - implemented with effect from 2014 admission - Orders Issued.*

**ACADEMIC BRANCH**

No. Acad/C2/7857/2014 (1)

Dated, Civil Station P.O, 04 - 07-2014

Read: 1.U.O No. Acad/C2/2232/2014 dated 14-03-2014

2. Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 27-01-2014
3. Minutes of the meeting of the Faculty of Technology held 01-04-2014
4. Letter dated 24.06.2014 from the Chairman, BOS in Computer Science (UG)

**ORDER**

1. The Revised Regulations for UG Programme under Choice based Credit & Semester System were implemented in this University with effect from 2014 admission as per paper read (1) above.

2. As per paper read (2) above the Board of Studies in Computer Science(UG) finalized the Scheme, Syllabus & model Question Papers for Core, Complementary & open courses of BSc Computer Science programme to be implemented with effect from 2014 admission.

3. As per read (3) above the Faculty of Technology held on 01-04-2014 approved Scheme, syllabus & model question papers for core/complementary & open courses of BSc Computer Science programme to be implemented with effect from 2014 admission.

4. The Chairman, Board of Studies in Computer Science (UG) vide paper read (4) above has submitted the finalized copy of Scheme, syllabus & Model question papers for core/complementary and open courses of BSc Computer Science programme for implementation with effect from 2014 admission.

5. The Vice Chancellor, after examining the matter in detail, and in exercise of the powers of the Academic Council as per section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised scheme, syllabus & model question papers of BSc Computer Science Programme with effect from 2014 admission.

6. Orders, are therefore issued implementing the revised scheme, syllabus & model question papers for core, complementary & open courses of BSc Computer Science programme under CBCSS with effect from 2014 admission subject to report to Academic Council

7. Implemented revised Syllabus is appended.

**Sd/-**  
**REGISTRAR**

To

1. The Principals of Affiliated Colleges offering B.Sc Computer Science Programme
2. The Examination Branch (through PA to CE)

Copy To:

1. The Chairman, BOS Computer Science (UG)
2. PS to VC/PA to PVC/PA to Registrar
3. DR/AR I Academic
4. Central Library
5. SF/DF/FC.

Forwarded/By Order



Section Officer



❖ For more details log on to [www.kannur\\_university.ac.in](http://www.kannur_university.ac.in)

*Handwritten initials*

# **KANNUR UNIVERSITY**



## **COURSE STRUCTURE AND SYLLABUS**

**For**

**UNDERGRADUATE PROGRAMME**

**In**

**COMPUTER SCIENCE**

**CORE, COMPLEMENTARY**

**And**

**OPEN COURSES**

**Under**

**CHOICE BASED CREDIT AND SEMESTER SYSTEM**

**w. e. f. 2014 ADMISSION**





**General Guidelines, Curricula, Syllabus and Scheme of examinations  
for B.Sc (Computer Science) Programme w.e.f 2014 admission  
onwards.**

B.Sc. Computer Science, an undergraduate programme under the Faculty of Technology of Kannur University, consists of Computer Science as core subject with two complimentary subjects. The duration of the programme is six semesters distributed over a period of three years. A semester consists of 90 working days including examination days distributed over a minimum of 18 weeks of five working days each.

**COURSES**

The number of courses required to complete the programme shall be 40. 'Course' means a segment of subject matter to be covered in a semester (traditionally referred to as paper). The courses include Common Courses including General Course, Complimentary Course, Core Course and Open Course. The break-up of the courses is as follows; Detailed course structure is given in table 1.

|                                                |            |
|------------------------------------------------|------------|
| Common courses (English + Additional language) | 0 6        |
| Common courses (General)                       | 0 4        |
| Complimentary I                                | 0 5        |
| Complimentary II                               | 0 5        |
| Core                                           | 1 9        |
| Open Course                                    | 0 1        |
| <b>Total</b>                                   | <b>4 0</b> |

## COURSE STRUCTURE

### B.Sc Computer Science[Core]

#### Semester –I

| No. | Course Name                                                        | Hours/Week |           | Credit    | Marks      |
|-----|--------------------------------------------------------------------|------------|-----------|-----------|------------|
|     |                                                                    | Theory     | Practical |           |            |
| 1   | Common course- English I                                           | 5          |           | 4         | 50         |
| 2   | Common course- English II                                          | 4          |           | 3         | 50         |
| 3   | Common course- Additional Language I                               | 5          |           | 4         | 50         |
| 4   | Core course-1<br>Introduction to Computers & Programming Languages | 1          | 2         | 3         | 50         |
| 5   | Complementary I ( Mathematics)                                     | 4          |           | 3         | 50         |
| 6   | Complementary II                                                   | 4          |           | 3         | 50         |
|     | <b>Total</b>                                                       | <b>23</b>  | <b>2</b>  | <b>20</b> | <b>300</b> |

#### Semester –II

| No. | Course Name                                 | Hours/Week |           | Credit    | Marks      |
|-----|---------------------------------------------|------------|-----------|-----------|------------|
|     |                                             | Theory     | Practical |           |            |
| 1   | Common course- English III                  | 5          |           | 4         | 50         |
| 2   | Common course- English IV                   | 4          |           | 3         | 50         |
| 3   | Common course -Additional Language II       | 5          |           | 4         | 50         |
| 4   | Core course- 2 Advanced Programming in C    | 1          |           | 2         | 50         |
| 5   | Core course -3 Lab-1 Advanced C Programming |            | 2         | 1         | 25         |
| 6   | Complementary I- ( Mathematics-II)          | 4          |           | 3         | 50         |
| 7   | Complementary II-                           | 4          |           | 3         | 50         |
|     | <b>Total</b>                                | <b>23</b>  | <b>2</b>  | <b>20</b> | <b>325</b> |

### Semester –III

| No. | Course Name                           | Hours/Week |           | Credit    | Marks      |
|-----|---------------------------------------|------------|-----------|-----------|------------|
|     |                                       | Theory     | Practical |           |            |
| 1   | General course-1 Programming with C++ | 3          | 2         | 4         | 50         |
| 2   | General course-2 Digital Electronics  | 4          |           | 4         | 50         |
| 3   | Core course-4 Data Structure          | 3          | 3         | 4         | 50         |
| 4   | Complementary I ( Mathematics-III)    | 5          |           | 3         | 50         |
| 5   | Complementary II                      | 5          |           | 3         | 50         |
|     | <b>Total</b>                          | <b>20</b>  | <b>5</b>  | <b>18</b> | <b>250</b> |

### Semester –IV

| No. | Course Name                                                    | Hours/Week |           | Credit    | Marks      |
|-----|----------------------------------------------------------------|------------|-----------|-----------|------------|
|     |                                                                | Theory     | Practical |           |            |
| 1   | General course-3 Database Management System                    | 3          |           | 4         | 50         |
| 2   | General course-4 Operating System                              | 4          |           | 4         | 50         |
| 3   | Core course-5 C# and.NET Programming                           | 3          |           | 4         | 50         |
| 4   | Core course -6 lab –II (Programming with C++ & Data Structure) |            | 2         | 1         | 25         |
| 5   | Core course-7 Lab-II ( .NET Programming & DBMS)                |            | 3         | 2         | 25         |
| 6   | Complementary I ( Mathematics-IV)                              | 5          |           | 3         | 50         |
| 7   | Complementary II                                               | 5          |           | 3         | 50         |
|     | <b>Total</b>                                                   | <b>20</b>  | <b>05</b> | <b>21</b> | <b>300</b> |

## Semester –V

| No. | Course Name                          | Hours/Week |           | Credit    | Marks      |
|-----|--------------------------------------|------------|-----------|-----------|------------|
|     |                                      | Theory     | Practical |           |            |
| 1   | Core course-8 Software Engineering   | 3          |           | 4         | 50         |
| 2   | Core course-9 Web Technology         | 2          | 3         | 3         | 50         |
| 3   | Core course-10 Java Programming      | 3          | 3         | 4         | 50         |
| 4   | Core course -11 Linux Administration | 3          | 2         | 3         | 50         |
| 5   | Core course -12 Elective-I           | 4          |           | 4         | 50         |
| 6   | Open Course                          | 2          |           | 2         | 25         |
|     | <b>Total</b>                         | <b>17</b>  | <b>08</b> | <b>20</b> | <b>275</b> |

## Semester –VI

| No. | Course Name                                       | Hours/Week |           | Credit    | Marks      |
|-----|---------------------------------------------------|------------|-----------|-----------|------------|
|     |                                                   | Theory     | Practical |           |            |
| 1   | Core course-13 System Software                    | 4          |           | 3         | 50         |
| 2   | Core course-14 Data Communication & Networks      | 4          |           | 3         | 50         |
| 3   | Core course-15 Computer Organization              | 3          |           | 3         | 50         |
| 4   | Core course -16 Elective-II                       | 4          |           | 3         | 50         |
| 5   | Core course -17 Lab IV – Java & Shell Programming |            | 3         | 2         | 25         |
| 6   | Core course-18 Lab IV Web Technology              |            | 2         | 2         | 25         |
| 7   | Core course -19 Lab V- Project                    | 2          | 3         | 5         | 100        |
|     | <b>Total</b>                                      | <b>17</b>  | <b>08</b> | <b>21</b> | <b>350</b> |

**Common course:**

Means a course that comes under the category of courses, including compulsory English and additional language courses and a set of general courses. There are 10 common courses for the BSc. Computer Science programme. This includes four English courses (two courses each in first and second semesters), two additional language courses (one course each in first and second semesters) and four General courses (two each in third and fourth semesters). The syllabi of general courses include the topics related to Computer Science.

**Complementary Course:**

Means a course which is generally related to the core course (traditionally referred to as subsidiary paper). There are two complimentary subjects for BSc. Computer Science programme. The total number of courses offered in each subjects shall be FIVE. Complementary courses are offered during first to fourth semesters.

**Core course:**

Means a compulsory course in a subject related to a particular degree programme. The core subject Computer Science consists of 13 theory papers, 5 practical papers and 1 project work. The semester wise list of Core and General Courses is given in Table 2.

**Open course:**

Means a course which can be opted by a student at his/her choice. There shall be one open course in core subjects in the fifth semester. The open course shall be open to all the students in the institution except the students in the parent department. The students can opt for that course from any other department in the institution. Each department can decide the open course from a pool of three courses offered by the university. The list of open courses in Computer Science is given in Table 3. for the purpose of open course B.Sc Computer Science and BCA should be considered as a single department.

**Table 2. Scheme of Core and General Courses**

| No | Se<br>m  | Course<br>Code  | Course Name                                       | Hours/Week |               | Credit   | Total<br>Crd/s |
|----|----------|-----------------|---------------------------------------------------|------------|---------------|----------|----------------|
|    |          |                 |                                                   | Theory     | Pract<br>ical |          |                |
| 1  | 1        | <b>1B01CSC</b>  | Introduction to Computers & Programming Languages | 1          | 2             | 3        | <b>3</b>       |
| 2  | 2        | <b>2B02CSC</b>  | Advanced Programming in C                         | 1          |               | 2        | <b>3</b>       |
| 3  | <b>2</b> | <b>2B03CSC</b>  | Lab-I Advanced C Programming                      |            | <b>2</b>      | <b>1</b> |                |
| 4  | 3        | <b>3A11CSC</b>  | Programming with C++                              | 3          | 2             | 4        | <b>12</b>      |
| 5  | 3        | <b>3A12CSC</b>  | Digital Electronics                               | 4          |               | 4        |                |
| 6  | 3        | <b>3B04CSC</b>  | Data Structure                                    | 3          | 3             | 4        |                |
| 7  | 4        | <b>4A13CSC</b>  | Database Management System                        | 3          |               | 4        | <b>15</b>      |
| 8  | 4        | <b>4A14CSC</b>  | Operating System                                  | 4          |               | 4        |                |
| 9  | 4        | <b>4B05CSC</b>  | C# and .NET Programming                           | 3          |               | 4        |                |
| 10 | <b>4</b> | <b>4B06CSC</b>  | Lab-II (Programming with C++ & Data Structure)    |            | <b>2</b>      | <b>1</b> |                |
| 11 | <b>4</b> | <b>4B07CSC</b>  | Lab-III (.NET Programming & DBMS)                 |            | <b>3</b>      | <b>2</b> |                |
| 12 | 5        | <b>5B08CSC</b>  | Software Engineering                              | 3          |               | 4        | <b>20</b>      |
| 13 | 5        | <b>5B09CSC</b>  | Web Technology                                    | 2          | 3             | 3        |                |
| 14 | 5        | <b>5B10CSC</b>  | Java Programming                                  | 3          | 3             | 4        |                |
| 15 | 5        | <b>5B11CSC</b>  | Linux Administration                              | 3          | 2             | 3        |                |
| 16 | 5        | <b>5B12CSC</b>  | Elective-I                                        | 4          |               | 4        |                |
| 17 | <b>5</b> | <b>5D---CSC</b> | Open Course                                       | <b>2</b>   |               | <b>2</b> |                |
| 18 | 6        | <b>6B13CSC</b>  | System Software                                   | 4          |               | 3        | <b>21</b>      |
| 19 | 6        | <b>6B14CSC</b>  | Data Communication & Networks                     | 4          |               | 3        |                |
| 20 | 6        | <b>6B15CSC</b>  | Computer Organization                             | 3          |               | 3        |                |
| 21 | 6        | <b>6B16CSC</b>  | Elective -II                                      | 4          |               | 3        |                |
| 22 | <b>6</b> | <b>6B17CSC</b>  | Lab IV- Java & Shell Programming                  |            | <b>3</b>      | <b>2</b> |                |
| 23 | <b>6</b> | <b>6B18CSC</b>  | Lab V Web Technology                              |            | <b>2</b>      | <b>2</b> |                |
| 24 | <b>6</b> | <b>6B19CSC</b>  | Project                                           | <b>2</b>   | <b>3</b>      | <b>5</b> |                |

| <b>Elective –I</b>  |                 |                      |                               |                    |                       |               |              |
|---------------------|-----------------|----------------------|-------------------------------|--------------------|-----------------------|---------------|--------------|
| <b>N<br/>o</b>      | <b>Se<br/>m</b> | <b>Course Code</b>   | <b>Course Name</b>            | <b>Hours/Week</b>  |                       | <b>Credit</b> | <b>Marks</b> |
|                     |                 |                      |                               | <b>Theor<br/>y</b> | <b>Practi<br/>cal</b> |               |              |
| 1                   | 5               | <b>5B12CSC - E01</b> | Algorithm Analysis and Design | 4                  | --                    | 4             | 50           |
| 2                   | 5               | <b>5B12CSC –E02</b>  | Computer Graphics             | 4                  | --                    | 4             | 50           |
| 3                   | 5               | <b>5B12CSC –E03</b>  | Data Mining                   | 4                  | --                    | 4             | 50           |
| <b>Elective –II</b> |                 |                      |                               |                    |                       |               |              |
| 1                   | 6               | <b>6B16CSC – E04</b> | Compiler Design               | 4                  | --                    | 3             | 50           |
| 2                   | 6               | <b>6B16CSC – E05</b> | Data Compression              | 4                  | --                    | 3             | 50           |
| 3                   | 6               | <b>6B16CSC – E06</b> | Information Security          | 4                  | --                    | 3             | 50           |

**Table 3. Scheme of OPEN COURSES for 5<sup>th</sup> Semester**

| <b>Sl.<br/>No</b> | <b>Se<br/>m</b> | <b>Course<br/>Code</b> | <b>Name of the Course</b>   | <b>Hours/<br/>Week</b> | <b>Credit</b> | <b>Marks</b> |
|-------------------|-----------------|------------------------|-----------------------------|------------------------|---------------|--------------|
| 1                 | 5               | <b>5D01CSC</b>         | Programming with C          | 2                      | 2             | <b>25</b>    |
| 2                 | 5               | <b>5D02CSC</b>         | Web Technology              | 2                      | 2             | <b>25</b>    |
| 3                 | 5               | <b>5D03CSC</b>         | Data Base Management System | 2                      | 2             | <b>25</b>    |



### Scheme of Complementary Courses

| No           | Sem | Course Code | Course Name                                       | Theory | Practical | Credit    | Total credit/s | Marks      |
|--------------|-----|-------------|---------------------------------------------------|--------|-----------|-----------|----------------|------------|
| 1            | 1   | 1C01CSC     | Fundamentals of Computers & Programming languages | 2      | 2         | 2         | 2              | 40         |
| 2            | 2   | 2C02CSC     | Programming in C                                  | 2      | 2         | 2         | 2              | 40         |
| 3            | 3   | 3C03CSC     | Data Base Management System                       | 3      | 2         | 3         | 3              | 40         |
| 4            | 4   | 4C04CSC     | Visual Programming                                | 3      |           | 3         | 5              | 40         |
| 5            | 4   | 4C05CSC     | Lab-I ( C Programming, DBMS & Visual Basic )      |        | 2         | 2         |                | 40         |
| <b>TOTAL</b> |     |             |                                                   |        |           | <b>12</b> |                | <b>200</b> |

#### CREDITS

Each course shall have certain credits. For passing the BSc. Computer Science programme the student shall be required to achieve a minimum of 120 credits of which 38 credits (14 credits for English courses, 8 credits for Additional language courses and 16 credits for General courses) shall be from common courses. Minimum credits required for core, complementary and open courses put together are 82. The distribution of credits for various courses is given in Table 3.

## CREDIT DISTRIBUTION (LRP-COMPUTER SCIENCE)

| SUBJECT          | SEM | COMMON    |            | GENERAL   | CORE          | COMPLEMENTARY |           | OPEN     | TOTAL      |
|------------------|-----|-----------|------------|-----------|---------------|---------------|-----------|----------|------------|
|                  |     | ENGLISH   | ADDITIONAL |           |               | Maths         | Stat      |          |            |
| COMPUTER SCIENCE | I   | 4+3       | 4          | ----      | 3             | 3             | 3         | ----     | <b>20</b>  |
|                  | II  | 4+3       | 4          | ----      | 2+1           | 3             | 3         | ----     | <b>20</b>  |
|                  | III | ----      | ----       | 4+4       | 4             | 3             | 3         | ----     | <b>18</b>  |
|                  | IV  | ----      | ----       | 4+4       | 4+1+2         | 3             | 3         | ----     | <b>21</b>  |
|                  | V   | ----      | ----       | ----      | 4+4+4+4+2     | ----          | ----      | 2        | <b>20</b>  |
|                  | VI  | ----      | ----       | ----      | 3+3+3+3+2+2+5 | ----          | ----      | ----     | <b>21</b>  |
| <b>TOTAL</b>     |     | <b>14</b> | <b>8</b>   | <b>16</b> | <b>56</b>     | <b>12</b>     | <b>12</b> | <b>2</b> | <b>120</b> |

### ATTENDANCE

Minimum 75% attendance is compulsory for theory as well as practical courses, failing which a student is not eligible to appear for university examinations.

### SEMINARS/ASSIGNMENTS

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination. The format of the title page of assignment /seminar report is given in Appendix I

### PROJECT WORK

Every student of B.Sc. Computer Science Programme shall have to work on a project of **FIVE** credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation at the end of sixth semester. Individual projects are recommended but in an instance where the number of supervising teachers is less, the project may be done

as group. The maximum number of students in a group shall be limited to **THREE**. The format of the title page of Dissertation is given in Appendix II

## RECORDS

A record is compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works.

## COURSE EVALUATION

The evaluation scheme for each course shall contain two parts

- a) Internal Assessment (IA)
- b) External Evaluation (End Semester Evaluation ESE)

20% weight shall be given to the internal evaluation. The remaining 80% weight shall be for the external evaluation. The distribution of marks for each course is given in Table 4.

**Table 4. Scheme of mark distribution of BSc. Computer Science programme**

| Courses       |                                    | No. of courses | Marks per course |      |                 | Total Marks |
|---------------|------------------------------------|----------------|------------------|------|-----------------|-------------|
|               |                                    |                | Int.             | Ext. | Total (Int+Ext) |             |
| Common        | English                            | 4              | 10               | 40   | 50              | 200         |
|               | Addl. Language                     | 2              | 10               | 40   | 50              | 100         |
| General       |                                    | 4              | 10               | 40   | 50              | 200         |
| Complementary | I (Mathematics)                    | 4              | 10               | 40   | 50              | 200         |
|               | II (Statistics (without Practical) | 4              | 10               | 40   | 50              | 200         |
|               | /Electronics/Physics)              | 5              | 8                | 32   | 40              | 200         |
| Core          | Theory                             | 13             | 10               | 40   | 50              | 650         |
|               | Practical                          | 5              | 05               | 20   | 25              | 125         |
|               | Project                            | -              | 20               | 80   | 100             | 100         |
| Open course   |                                    | 1              | 5                | 20   | 25              | 25          |
| <b>Total</b>  |                                    |                |                  |      |                 | <b>1800</b> |

**Internal Assessment:**

20% of the total marks in each course are for internal assessment. The marks secured for internal assessment only need be sent to university by the colleges concerned. The internal assessment shall be based on a predetermined transparent system involving written test, assignments/ seminars/ Viva and attendance in respect of theory courses and submissions and records, tests and attendance in respect of practical courses. Components with percentage of marks of Internal Evaluation of

Theory Courses are-

|                          |       |
|--------------------------|-------|
| Attendance               | - 25% |
| Assignment/ Seminar/Viva | - 25% |
| Test paper               | - 50% |

For practical courses-

|                        |       |
|------------------------|-------|
| Attendance             | - 25% |
| Submissions and Record | - 25% |
| Practical Test Paper   | - 50% |

(If a fraction appears in total internal marks, nearest whole number is to be taken)

Attendance of each course shall be evaluated as below-

| Attendance %   | % Marks Allotted                 |
|----------------|----------------------------------|
| Above 90%      | 100%                             |
| 85 to 89%      | 80%                              |
| 80 to 84 %     | 60%                              |
| 75 to 79 %     | 40%                              |
| Less than 75 % | Not eligible for University exam |

## Theory External Evaluation:

External evaluation carries 80% of marks. All question papers shall be set by the university. The external examination in theory courses is to be conducted with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined Scheme of valuation and answer keys provided by the University. Details regarding the End Semester Evaluation of core complementary and open courses are given below:

### 1. Core Courses

- Maximum Marks for each course - **40 Marks**
- Duration of examination - **3 Hrs.**

| Sl.No | Type of Question                       | Marks | Number of Questions to be answered / total number of questions | Max. Marks |
|-------|----------------------------------------|-------|----------------------------------------------------------------|------------|
| 01    | A bunch of 8 one word answer questions | 0.5   | 08/08                                                          | 04         |
| 02    | Short answer                           | 2     | 07/10                                                          | 14         |
| 03    | Short Essay /Programs                  | 3     | 04/06                                                          | 12         |
| 04    | Essay Type                             | 5     | 02/04                                                          | 10         |

### 2. Complementary Courses

- Maximum Marks for each course - **32 Marks**
- Duration of examination - **3 Hrs.**

| Sl.No | Type of Question                       | Marks | Number of Questions to be answered / total number of questions | Max. Marks |
|-------|----------------------------------------|-------|----------------------------------------------------------------|------------|
| 01    | A bunch of 6 one word answer questions | 0.5   | 06/06                                                          | 03         |
| 02    | Short answer                           | 2     | 05/08                                                          | 10         |
| 03    | Short Essay /Programs                  | 3     | 03/05                                                          | 09         |
| 04    | Essay Type                             | 5     | 02/04                                                          | 10         |

### 3. Open Course

- Maximum Marks for open course - **20 Marks**
- Duration of examination - **2 Hrs.**

| Sl.No | Type of Question                       | Marks | Number of Questions to be answered / total number of questions | Max. Marks |
|-------|----------------------------------------|-------|----------------------------------------------------------------|------------|
| 01    | A bunch of 8 one word answer questions | 0.5   | 08/08                                                          | 04         |
| 02    | Short answer                           | 2     | 03/05                                                          | 06         |
| 03    | Short Essay /Programs                  | 3     | 02/04                                                          | 06         |
| 04    | Essay Type                             | 4     | 01/02                                                          | 04         |

#### External Evaluation Practical

External evaluation carries 80% of marks. All question papers shall be set by the university. The external examination in practical courses shall be conducted by **TWO** external examiners appointed by the University. No practical examination will be conducted in odd semester. Practical examinations shall be conducted in the even semester (II, IV and VI). The Scheme of Examinations and Model Question Papers of all the theory and practical courses offered under core, general and open courses are include in the detailed syllabus. Practical examination assessment of different components may be taken as below.

| Components           | Part A    | Part B    |
|----------------------|-----------|-----------|
| Program code         | 3         | 3         |
| Error free Execution | 2         | 2         |
| Perfect Output       | 2         | 2         |
| Modification         | 1         | 1         |
| Viva-voce            | 2         | 2         |
| <b>Total</b>         | <b>10</b> | <b>10</b> |

## Project Evaluation

Evaluation of the Project Work shall be done under Mark System at two stages:

- a) Internal Assessment (supervising teachers will assess the project and award internal Marks)
- b) External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

| Internal (20% of the Total)                        |            |           | External ( 80% of Total)                                              |            |           |
|----------------------------------------------------|------------|-----------|-----------------------------------------------------------------------|------------|-----------|
| Components                                         | % of Marks | Marks     | Components                                                            | % of Marks | Marks     |
| Punctuality                                        | 20         | 04        | Writing synopsis/Abstract                                             | 12.5       | 10        |
|                                                    |            |           | Content of the Report                                                 | 12.5       | 10        |
| Relevance of topic System study / Design of tables | 20         | 04        | Quality of project work/ Use of software/ tools                       | 12.5       | 10        |
|                                                    |            |           | Perfection of the work done (Designs of tables/ Input & Output forms) | 25         | 20        |
| Project Report                                     | 30         | 06        | Live demo                                                             | 12.5       | 10        |
| Presentation & Viva-voce                           | 30         | 06        | Viva-Voce                                                             | 25         | 20        |
| <b>Total</b>                                       | <b>100</b> | <b>20</b> | <b>Total</b>                                                          | <b>100</b> | <b>80</b> |

External Examiners will be appointed by the University in consultation with the Chairperson of the Board. Project evaluation shall be done along with the external examination of Core Practical lab IV & V in sixth semester.

**Pass Conditions:**

Submission of the project report and presentation of the student for viva are compulsory for the evaluation. No marks shall be awarded to a candidate if she/he fails to submit the project report for external evaluation. The student should get a minimum of 40 % marks for pass in the project. There shall be no improvement chance for the Marks obtained in the Project Report. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re-done and the report may be re-submitted along with subsequent exams through parent department.



# **1B01CSC**

## **Introduction to Computers & Programming Languages**

*Contact Hours / Week: Theory: 1 & Lab 2 Credits: 3*

### **Aim**

*To introduce basic concepts of computer system and study about algorithms, flowchart and problem solving through logical thinking.*

### **Objectives**

1. *To know the working principle of a computer.*
2. *To analyze the problem and write algorithm and flowchart.*
3. *To impart skills to enable students to use digital knowledge resources in learning.*

### **Module 1**

Introduction to Computers: Characteristics, Evolution, Generation, Classification, CPU- ALU, Registers, Control Unit, System Bus, Main Memory Unit, Cache Memory. Types of RAM & ROM. Secondary storage devices: magnetic, optical and magneto-optical storage devices. Mass storage devices. Data Representation in Computers, Input and Output devices.

### **Module II**

Computer Programming: Introduction, Developing a program, program development cycle, Algorithm, Flowchart, program control structures, programming paradigms. Characteristics of a good program. Programming languages: Types and Generations of programming languages. Assembler, Compiler and Interpreter. Program : structure, top-down design, source code, object code, executable file, file extensions.

### **Module III**

Importance of C; Basic structure of C, Programming style, Executing a C program. Character set, C tokens, Keywords, Identifiers, Constants, Data types, Declaration of variables, Operators. Precedence and order of evaluation. Type conversion in expression. Common programming errors, Program testing and debugging

## Module IV

Managing Input output operation: reading a character, writing a character, formatted input output. Branching statements-if, if..else, nested if...else, else...if ladder, switch statement, go to statement. Looping statements- while, do...while, for loop. Break and continue statements.

## Module V

Knowledge skills for higher education: Data, information and knowledge, Internet access methods –Dial-up, DSL, Cable, ISDN, Wi-Fi. Basic concepts of IPR, copyrights and patents, plagiarism, software piracy, cyber ethics, cybercrime, cyber threats, cyber security, privacy issues, cyber laws, cyber addictions, information overload, health issues- guide lines for proper usage of computers, internet and mobile phones.

## Text Book

1. Computer Fundamentals and Programming in C, Anita Goel, Ajay Mittal, Pearson Education.
2. Introduction to information Technology, ITL Education solutions, Pearson Education
3. ANSI C, E. Balagurusamy, McGraw-Hill Publication
4. V. Rajaraman, Introduction to Information Technology, Prentice Hall
5. Technology in Action, Pearson

## References

1. Programming in C, Ashok N Kamthane, Perason Education.
2. Alexis & Mathews Leon, Fundamentals of Information Technology, Leon Vikas
3. Barbara Wilson, Information Technology: The Basics, Thomson Learning
4. Ramesh Bangia, Learning Computer Fundamentals, Khanna Book Publishers
5. Computer Basics and c Programming, V. Rajaraman, PHI, 2008
6. Let us C, Yeshvanth Kanethkar, 3rd Edn, BPB,

**Model Question Paper**  
**1B01CSC Introduction to Computers & Programming Languages**

**Time: 3 Hrs**

**Max. Marks: 40**

**SECTION A**

1. **One word answer** **(8 x 0.5 = 4 marks)**
- a. The fastest memory in a computer system is-----
  - b. -----enables the processor to access data quickly whenever they are needed.
  - c. PDA stands for-----
  - d. An individual small dot, which one sees on the computer screen is called-----
  - e. The sequence of instructions that instruct the computer to carry out a specific task is called-----
  - f. Compiler and Interpreter are also called -----
  - g. What is the minimum number of temporary variables required to swap the content of two variables.
  - h. The arguments following the first argument in a scanf function should denote-----

**SECTION B**

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

- 2. Compare interpreter and compiler.
- 3. What is a system bus?
- 4. Define an algorithm.
- 5. How will you read and write a character in C.
- 6. What are the new threats in the IT industry.
- 7. What is compiler?
- 8. Explain ISDN.
- 9. What are the rules of variable naming convention in C.
- 10. Define conditional operator.
- 11. What are C Tokens.

### **SECTION C**

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. Explain the features of a good programming language
13. Discuss three basic program control structures with suitable examples.
14. Write a note on Cyber Security.
15. Give the importance of IT in teaching and learning.
16. Explain about the input and output devices.
17. Explain about the data types in C.

### **SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. Explain about the looping statements in C.
19. What are the Internet access methods? Explain any four.
20. Write a note on program testing and debugging.
21. Explain about the generation and classification of computers.

# **2B02CSC**

## **Advanced Programming in C**

*Contact Hours / Week: Theory: 01    Credit: 2*

### **Aim**

*To introduce procedure oriented concept and to impart skill in advanced programming.*

### **Objectives**

1. *To develop c programs using advanced constructs.*
2. *To design algorithm for solving a programming problems.*
3. *Develop skill in programming.*

### **Module I**

Arrays: Introduction to Arrays One Dimensional Array Strings Two Dimensional, Array Multi- dimensional Array. Strings: Basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat & strcmp. Two dimensional arrays of strings

### **Module II**

Functions: Introduction to Functions, Function Declaration and Prototypes, Storage Classes Recursion in Function.

### **Module III**

Pointers: Introduction to Pointers, Pointer Notation, Pointer Declaration and Initialization, Accessing Variable through Pointer, Pointer Expressions. Pointers and One Dimensional Arrays, Arrays of Pointers, Pointer to Pointers, Pointers and Functions.

### **Module IV**

Structures and Unions: Structure Definition, Structure Initialization, Arrays of Structures, Arrays within Structures, Structures within Structures, Passing Structures to Functions. Union–Definition and Declaration, Accessing a Union Member, Initialization of a Union Variable, Use of User Defined Type Declarations. Dynamic Memory Allocation.

### **Module V**

File Handling in C: What is a File. Defining and Opening a File, Functions for Random Access to Files. Types of C preprocessor directives, Macros- comparison with functions, Command line arguments.

**Text Books:**

- 1) Programming with ANSI and Turbo C, Ashok N. Kamthane, 1st edn, Pearson Education.
- 2) Balagurusamy, E: "Programming in ANSI C" 2nd Edition. Tata McGraw-Hill

**Reference:**

- 1) Deitel, H M and Deitel P J: "C How to Program", 2nd Edition. Prentice-Hall.
- 2) Kanetkar, Yashavant: "Let Us C", 4th Edition. BPB Publications.
- 3) Gottfried, Byron S: "Programming with C", 1996. Tata McGraw-Hill

**Model Question Paper**  
**2B02CSC Advanced Programming in C**

**Time: 3 Hour****Max Marks 40****SECTION A**

1. **One word answer** **(8 x 0.5 = 4 marks)**
  - a. Maximum number of elements in a [5] [13] is .....
  - b. What will be the output of the following code:

```
void main(){ int x;
for(x=1;x<=5;x++);
printf("%d",x); }
```
  - c. .... is a method for packing data of different types.
  - d. The strcmp() function compares two strings identified by the arguments and returns the value ..... if they are equal.
  - e. main() is an example of .....function.
  - f. A variable which declared in static storage class has initial value.....
  - g. C program uses a semicolon as a .....
  - h. The string related file supplied by C standard library is ....

### **SECTION B**

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. How can we initialize an array?
3. Which function is used to deallocate memory.
4. Define Macro.
5. What is the difference between structure and union?
6. What is a library function?
7. Give an example to illustrate the concept of structures.
8. What is function prototype? Give one example.
9. What are formal parameters in functions?
10. Give the meaning of declaration: `int *ptr;`
11. Give syntax for opening a file.

### **SECTION C**

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. Write a C program to access array elements using Pointers.
13. write note on dynamic memory allocation.
14. Explain storage classes in C.
15. Explain recursive function with an example.
16. write note on preprocessor directives in C language.
17. what do you mean by command line arguments.

### **SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. Explain briefly the term 'user defined functions' and its categories.
19. Explain string-handling functions in detail
20. Define a structure data type called Employ containing three fields : name ,age and designation . Develop a program that would assign values to the individual members and display it.
21. Write a program to create a file and store some records in it. Display the contents of the same.

## **2B03CSC Lab-I**

### **Advanced C Programming**

*No. Practical Hours / Week: 02 Credit:1*

#### **Guidelines**

- *Follow standard coding method*
- *Write Algorithm and draw flow chart neatly*
- *The output of the program should be neatly formatted*
- *Practice all the programs in the lab*

#### **Sample Program list**

- 1) Write a program to print the size of all the data types in C and its range.
- 2) Write a program to convert Fahrenheit to Celsius.
- 3) Write a program to check whether the given number is a Prime number or not.
- 4) Write a program to accept three numbers and find the largest and second largest
- 5) Write a program to print all prime numbers between any 2 given limits.
- 6) Write a program to print all the Armstrong numbers between any 2 given limits.
- 7) Write a program to check whether the string is a Palindrome.
- 8) Write a program to check whether a given matrix is an Identity matrix or not.
- 9) Write a program to perform matrix multiplication.
- 10) Write a program to count the different vowels in a line of text.
- 11) Write a program to accept two numbers and perform various arithmetic operations (+, -, \*, /) based on the symbol entered.
- 12) Write a program to find the roots of a quadratic equation
- 13) Write a recursive program to find the factorial of a number.
- 14) Create an employee structure and display the same.
- 15) Write a function to swap two numbers using pointers
- 16) Write a program to access an array of integers using pointers
- 17) Create a file and store some records in it. Display the contents of the same.
- 18) Implement search, modify, and delete operations.
- 19) Perform the different bitwise operations (menu driven program) .The i/p and the o/p should be displayed in Binary form.
- 20) Write a program to check whether a given number is odd or even using bitwise operators.

#### **QUESTION PAPER PATTERN**

Two questions will be selected by the examiners. Students have to write and execute both programs.



# **3A11CSC**

## **Programming with C++**

*No. of Hours / Week: Theory: 3 & Lab 2 Credit: 4*

### *Aim*

*To introduce Object oriented concepts and to impart skill in object oriented programming using C++.*

### *Objectives*

- 1. Introduce concepts such as classes and objects.*
- 2. Define and use classes and objects using C++ language.*
- 3. Introduce OOPs concepts such as inheritance and polymorphism and their implementation using C++.*
- 4. Skill in developing OOPs Program for a given problem.*

### **Module I**

Principles of object oriented programming; OOP paradigm; Basic concepts of OOP; Benefits; applications. Introduction to C++, Structure of C++ program; how to create and execute a C++ program. declaration and dynamic initialization of variables; reference variables. Operators; Scope resolution; memory dereferencing and memory management operators; manipulators; operator overloading; operator precedence; Control structures.

### **Module II**

Functions: main; prototyping; call by reference; inline function; default and const arguments; function overloading; friend functions; Math library functions. Structures; Specifying a class; Defining member functions; making an outside function inline; nesting of member functions; private member functions; arrays within a class; memory allocation for objects; static data members; static member functions; arrays of objects; objects as function arguments; friendly functions; returning objects; const member functions;.

### **Module III**

Constructors and destructors : - Constructors; Parameterized constructors; multiple constructors in a class; constructors with default arguments; dynamic

initialization of objects; copy constructor; Dynamic constructors; const objects; Destructors. Operator overloading – definition; overloading unary operators; overloading binary operators; overloading binary operators using friends; manipulation of strings using operators; rules for overloading operators.

#### **Module IV**

Inheritance – defining derived classes; single inheritance; making a private member inheritance; multilevel inheritance; multiple inheritance; hierarchical inheritance; hybrid inheritance; virtual base classes; abstract classes; Nesting of classes. Pointers; Pointers to objects; Pointers to derived classes; virtual functions; pure virtual functions.

#### **Module V**

C++ streams; stream classes; unformatted I/O operations; Formatted console I/O operations; Managing output with manipulators. Files – classes for file stream operations; Opening and closing a file; file modes; file pointers and their manipulations; Sequential input and output operation.

#### **Text Book:**

1.Object Oriented Programming with C++; E. Balagurusamy; 3rd Edn; TMH 2006.

#### **Reference:**

1. Object Oriented Programming with ANSI & Turbo C++, Ashok N. Kamthane, Pearson Education
2. Programming in C++, M.T. Somashekara, Prentice Hall of India, New Delhi
3. Let us C++, Yeshwanth Kanethkar, BPB

### **Model Question Paper** **3A11CSC Programming with C++**

**Time: 3 Hrs**

**Max. Marks: 40**

#### **SECTION A**

#### **1.One word answer**

**(8 x 0.5 = 4 marks)**

- a. Instance of a class is called \_\_\_\_\_
- b. \_\_\_\_\_ is memory dereferencing operator.
- c. The default access level assigned to members of a class is \_\_\_\_\_
- d. Default value of a static variable is \_\_\_\_\_

- e. Every class has .....constructor function, even when none is declared.
- f. Abstract class has \_\_\_\_\_ number of objects.
- g. In operator overloading unary operator has\_\_\_\_\_ number of arguments.
- h. Mechanism of deriving a class from another derived class is known as\_\_\_\_\_

### SECTION B

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

- 2. Explain reference variable with suitable example.
- 3. Explain scope resolution operator.
- 4. Write a note on inline function.
- 5. Write a note on array of objects.
- 6. What is a destructor.
- 7. What are the rules for operator overloading.
- 8. Explain abstract base class.
- 9. Write a note on nesting of classes.
- 10. What is the use of fstream class.
- 11. Describe various file mode options

### SECTION C

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

- 12. Explain the difference between while and do-while loops.
- 13. Discuss function overloading with suitable examples.
- 14. Explain copy constructors with suitable example.
- 15. Explain about virtual base class.
- 16. Write a C++ program to write and read integers from a file.
- 17. Write a C++ program to add two complex numbers using operator overloading

### SECTION D

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

- 18. Explain the basic concepts of Object Oriented Programming.
- 19. Explain the following :
  - a). Friend Function
  - b). Static member functions.
- 20. Write a note on Operator Overloading.
- 21. Explain Inheritance and its types with suitable example.

# 3A12CSC

## Digital Electronics

*No. of Contact Hours / Week: Theory: 4 Credit: 4*

### *Aim*

*To impart basic knowledge in digital logic and circuits*

### *Objectives*

- 1. To introduce student to basic concepts of digital logic*
- 2. To introduce students to the design of basic logic circuits*
- 3. To introduce students to some commonly used combinational and sequential circuits*

### **Module I**

Digital Concepts: Introduction, Decimal numbers, Binary numbers, Decimal to binary conversions, Binary arithmetic, 1's and 2's complements of Binary numbers, Signed numbers, Arithmetic operations. Hexadecimal numbers, Octal numbers, Digital codes, Binary coded decimal (BCD).

### **Module II**

Logic Gates: Positive and negative logic, NOT gate, AND gate, OR gate, NAND gate, NOR gate, EX-OR and EX-NOR gates. Boolean Algebra: Boolean operations, logic expressions, rules and laws of Boolean algebra, DeMorgan's theorems, Boolean analysis of logic circuits, Simplification using Boolean algebra, Standard forms, SOP and POS Expressions, Karnaugh map techniques SOP & POS (up to 4 variables).

### **Module III**

Combinational Logic Circuits: Implementation, Universal property of NAND and NOR gates, Half adder, Full adder, Parallel binary adder, Comparators, Decoders, BCD to 7-segment decoder, Encoders, Code converters, Multiplexers and Demultiplexers, Parity generators and Checkers .

### **Module IV**

Sequential Logic Circuits: SR Latches, Gated S-R latch, gated D latch, Flip-Flops: Edge triggered flip flops, Master Slave flip flops, Applications Counters: Asynchronous counters, Decade Asynchronous counters, Synchronous counters, synchronous Decade counters, up/down synchronous counter, Applications.

### **Module V**

Shift register: serial in - serial out, serial in - parallel out, parallel in - serial out, parallel in-parallel out configurations. Ring counter, Johnson's counter,

**Text Book:**

1. Digital Fundamentals-Thomas L. Floyd & RP Jain, 10<sup>th</sup> Edition, Pearson Edition

**References:**

1. Digital logic and computer design – Moris Mano- PHL
2. Digital Principles and Applications- A. P. Malvino, McGraw Hill Int Editions (Fourth Edition)
3. Modern Digital Electronics- R. P. Jain, Tata McGraw Hill Pub. Company(Third Edition)
4. Digital Computer Fundamentals- Bartee T.

**Model Question Paper**  
**3A12CSC Digital Electronics**

**Time: 3 Hrs****Max. Marks: 40****SECTION A****1. One word answer****(8 x 0.5 = 4 marks)**

- a. A quantity having continuous value is called.....
- b. 01100100 divided by 00011001 is.....
- c. In ..... Gate similar input produces a LOW
- d. When both inputs of a JK flip flops are high , the output will.....
- e. The modulus-10 Johnson counter is requires.....number of flip flops
- f.  $A+1=$ .....
- g. Which of the following gate has Universal property OR b. AND c. NAND d.XOR
- h. A synchronous decade counter requires ..... number of flip flops

**SECTION B****Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. Write a short note on Digital data.
3. Convert the following to binary system
  - a.  $(100100.01)_{10}$
  - b.  $(0001011.101)_{10}$
4. Explain DeMorgan's theorem
5. Explain the universal property of NOR gate

6. Draw the circuit and truth table of an SR latch
7. State and prove any four rules of Boolean algebra.
8. What are edge-triggered flip flops?
9. Draw the logic circuit of gated D-latch.
10. Explain the Grey to binary code converter.
11. Write a short note on ripple counters.

### SECTION C

**Answer ANY FOUR of the following questions**

**(4 x 3 = 12 marks)**

12. What is a full adder explain?
13. Apply Demorgans theorem and simplify the expression  $XY'Z'+X'Y'W+XZ'$ .
14. Compare multiplexers and demultiplexers.
15. Differentiate synchronous and asynchronous counters.
16. What are flip-flops? Explain its applications.
17. Explain up/down counter in detail

### SECTION D

**Write an essay on ANY TWO of the following questions**

**(2 x 5 = 10 marks)**

18. Write a note on K map. Minimize the following expression  

$$B'C'D'+A'BC'D'+ABC'D'+A'B'CD+AB'CD+A'B'CD'+A'BC'D'+ABCD'+AB'CD'$$
19. What is a decoder. Explain the 7 segment display decoder.
20. Explain four-bit synchronous decade counter
21. What are shift registers? Draw and explain the diagram of serial in-parallel out shift register.

# **3B04CSC**

## **Data Structure**

*No. of Contact Hours / Week: Theory: 3 & Lab 3 Credit: 4*

*Aim:*

*To familiarize the students with the methodology of computer science.*

*Objectives:*

- 1. To introduce the concept of analysis of algorithms and ability to compare algorithms based on time and space complexity.*
- 2. To familiarize with selected linear and nonlinear data structures.*
- 3. To enhance skill in programming.*
- 4. To inculcate systematic approach to programming.*
- 5. Develop ability to select appropriate data structure for a given problem.*

### **Module I**

Data structures: Definition and Classification. Analysis of Algorithms : Apriori Analysis; Asymptotic notation; Time complexity using O notation; Average, Best and Worst complexities. Arrays:- Operations; Number of elements; Array representation in memory. Polynomial- Representation with arrays; Polynomial addition. Recursive algorithms: examples – factorial and Tower of Hanoi problem.

### **Module II**

Search : Linear and Binary search; Time complexity; comparison. Sort : Insertion, bubble, selection, quick and merge sort; Comparison of Sort algorithms.

### **Module III**

Stack: Operations on stack; array representation. Application of stack- i. Postfix expression evaluation. ii. Conversion of infix to postfix expression. Queue : Operation on queue. Array Implementation; Limitations; Circular queue; Dequeue and priority queue. Application of queue: Job scheduling.

### Module IV

Linked list – Comparison with arrays; representation of linked list in memory. Singly linked list- structure and implementation; Operations – traversing/printing; Add new node; Delete node; Reverse a list; Search and merge two singly linked lists. Stack with singly linked list. Circular linked list – advantage. Queue as Circular linked list. Doubly linked list – structure; Operations – Add/delete nodes; Print/traverse. Advantages.

### Module V

Tree and Binary tree: Basic terminologies and properties; Linked representation of Binary tree; Complete and full binary trees; Binary tree representation with array. Tree traversal : Recursive inorder, preorder and postorder traversals. Binary search tree- Definition and operations (Create a BST, Search, Time complexity of search).

### Text Book:

Data Structures and Algorithms: Concepts, Techniques and Applications; GAV Pai, Mc Graw Hill, 2008.

### Reference Books:

1. Data Structures in C, Achuthsankar and Mahalekshmi, PHI, 2008
2. Fundamentals of Data structures in C++ , 2<sup>nd</sup> Edn, Horowitz Sahni, Anderson, Universities Press
3. Classic Data structures, Samanta, Second Edition, PHI

## Model Question Paper 3B04CSC Data Structure

**Time: 3 Hrs**

**Max. Marks: 40**

### SECTION A

**1. One word answer**

**(8 x 0.5 = 4 marks)**

- a . A 2-D array is also called .....
- b A data structure is said to be .....if its elements form a sequence.
- c. A .....is nothing but an array of characters.
- d An array of pointers to strings stores .....of the strings
- e The '\0' character indicates.....
- f. A matrix is called sparse when.....
- g O notation stands for .....
- h Basic operations in linked list are .....



### **SECTION B**

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. What is Apriori Analysis
3. How to delete an element from the linked list
4. Define data structure
5. What is a sparse matrix?
6. What is garbage collection?
7. What is compaction?
8. What is the use of stack in real life?
9. Define dynamic data structure
10. What is multi stacks?
11. What is the complexity of algorithms?

### **SECTION C**

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. Transform following prefix expression into infix a) +A-BC b) +-\$ABC\*D\*\*EFG
13. Explain binary search in detail.
14. Explain advantageous of circular linked list.
15. Write program to which count number of words in a given text.
16. How to delete elements from a double link list
17. What is a sparse matrix explain

### **SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. Write a program that would accept an expression in infix form and convert it to a prefix form
19. What are the different operations on linked list? Explain
20. What are the advantages of binary tree search?
21. Compare different sorting algorithms

# 4A13CSC

## Database Management System

*Contact Hours/ Week: Theory 3 Credit: 4*

### *Aim*

*To introduce basic concepts of data bases, and related techniques and tools*

### *Objectives:*

1. *Introduce the fundamentals of Data Base Management System.*
2. *Skill in designing database.*
3. *Familiarization of different DBMS models.*
4. *Skill in writing queries using MySQL.*

### **Module I**

Introduction–purpose of Database systems. View of Data, data Models, transaction management, database structure, DBA, Data Base Users.

### **Module II**

E-R model, Basic concepts; design issues; Mapping Constraints; Keys; Primary, Foreign, candidate, E-R diagram; Weak entity set; Extended E-R features. Normal forms – 1NF, 2NF, 3NF and BCNF; functional dependency, Normalization.

### **Module III**

SQL : database languages; DDL; create, alter, Drop, DML, Insert into, Select, update, Delete,. DCL commands, Data types in SQL; Creation of database and user.

### **Module IV**

Developing queries and sub queries; Join operations; Set operations; Integrity constraints, views, Triggers, functions and Sequences.

### **Module V**

Relational model – Structure of Relational database. Relational Algebra; Fundamental operations; Relational calculus; Tuple and domain calculus.

### **Text books:**

1. Database system concepts; Silberschatz, Korth and Sudarsan, 5th Edn; McGraw Hill.
2. The Database book : Principles and Practice Using MySQL; Gehani; University Press.

### **Reference:**

1. Fundamentals of Database systems, E. Navathe, 4th edn, Pearson Education.
2. Introduction to data base systems ITL Education Solutions Limited.

## Model Question Paper

### 3A13CSC – Database Management System

Time: 3 Hrs

Max. Marks: 40

#### SECTION A

1. **One word answer** (8 x 0.5 = 4 marks)
- a. The collection of information stored in the database is called.....?
  - b. The data hold across the primary key column must be\_\_\_\_\_
  - c. Primary goal of data base is?
  - d. \_\_\_\_\_ Keys represent relationships between tables
  - e. The structure of database is.....?
  - f.....is the association among several entities?
  - g. For each attribute there is a set of permitted values is called.....?
  - h. Example of derived attribute

#### SECTION B

**Write short notes on ANY SEVEN of the following questions** (7 x 2 = 14 marks)

2. What is the usage of CREATE command?
3. Write a note on E-R Model?
4. Explain about INSERT command?
5. Write a note on nave users and application programmers?
6. Which are the different types of attributes?
7. Explain UPDATE command.
8. Define foreign key.
9. Define functional dependency.
10. Write the syntax of Alter query and explain.
11. What is Projection operation in relational algebra.

#### SECTION C

**Answer ANY FOUR of the following questions** (4 x 3 = 12 marks)

12. Explain transaction management?
13. Explain the advantages of DBMS?
14. Which are the different types of keys?
15. Explain components of SQL?
16. Write a note on ALTER command?
17. Which are the different data types used in SQL

#### SECTION D

**Write an essay on ANY TWO of the following questions** (2 x 5 = 10 marks)

18. What do you mean by Database administrator? Explain functions of DBA?
19. Explain relational algebra?
20. Explain ER data Model.
21. Write a detailed note on normalization

# 4A14CSC

## Operating System

*Contact Hours /Week : Theory: 4 Credit : 4*

### **Aim**

*To acquire the fundamental knowledge of the operating system architecture and components and to know the various operations performed by the operating system.*

### **Objectives:**

1. Familiarize with basics of design of operating systems
2. Introduce basic working process of operating systems.
3. To understand the importance process and scheduling.
4. To understand the issues in I/O devices synchronization and memory management

### **Module I**

Introduction - Batch Processing System – Multi programming system - Time Sharing System – Real Time System. (Text book 2). Operating system structures: System Components-Process management, Main memory management, File management, I/O system management, Secondary storage management, (Text Book 1).

### **Module II**

Processes : Process Concept – The Process , Process State , Process Control Block - Process Scheduling – Schedulers , Context Switch - CPU Scheduling: Basic Concepts –CPU scheduler , Pre-emptive scheduling, Dispatcher- Scheduling criteria – Scheduling algorithms –FCFS, SJFS , Priority Scheduling, Round Robin Scheduling (Text Book 1).

### **Module III**

Dead locks: Characterization – necessary conditions – Resource allocation graph – Methods for handling deadlock - Deadlock prevention – mutual exclusion, hold and wait, no preemption, circular wait – Deadlock avoidance – safe state, Resource allocation graph, Banker's algorithm, Safety algorithm, Resource request algorithm – Deadlock detection –single instance of each resource type, several instances of a resource type - recovery from dead lock – process termination, resource preemption (Text book 1).

**Module IV**

Memory management [ basic concepts only]: Single contiguous Allocation – Partitioned allocation – Relocatable partitioned – Paging – Demand paging – Segmentation – Segmentation and demand paging – Other schemes (Text book 3).

**Module V**

Mass Storage Structure: Disk Structure-Disk Scheduling: FCFS Scheduling, SSTF Scheduling, SCAN Scheduling-SCAN Scheduling, LOOK Scheduling - Selection of a Disk Scheduling Algorithm (Text book 1).

**Text Book**

1. Silberschatz & Galvin – Operating System Concepts – Sixth edition – WSE publications
2. Dhamdhere, “Systems Programming and Operating Systems”, 2<sup>nd</sup> Revised Edn, TMH
3. Stuart E Madnick and John J Donovan, “Operating Systems”, Tata McGraw-Hill, 2005

**Reference**

- 1 Yeshavant . P. Kanetkar – “Unix Shell Programming” – BPB Publications
- 2 Stallings “Operating System Internals and design Principles” Pearson Pub
- 3 Nutt Chaki ,Neogy “ Operating Systems“ Pearson Pub

**Model Question Paper**  
**4A14CSC Operating System**

**Time: 3 Hrs**

**Max. Marks: 40**

**SECTION A**

1. **One word answer** **(8 x 0.5 = 4 marks)**
  - a. In ..... system a series of jobs are executed without manual intervention.
  - b. PCB stands for \_\_\_\_\_
  - c. Degree of multi programming is controlled by \_\_\_\_\_ scheduler.
  - d Bankers algorithm is used for \_\_\_\_\_
  - e Deadlocks can be described in terms of a direct graph called \_\_\_\_\_
  - f The number of processes completed per unit time is known as \_\_\_\_\_.
  - g. \_\_\_\_\_ is the memory management scheme that support user view of memory.
  - h The time taken to move the disk arm to the desired cylinder is called .....

**SECTION B**

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 mark)**

- 2 What is real time system?
- 3 What is dispatcher?
- 4 List two advantages of Multiprogramming?
- 5 What is a process?
- 6 When do you say a process is in safe state?
- 7 Define operating system?
- 8 Write note on context switch.
- 9 Define deadlock.
- 10 What is swapping?
- 11 Write note on page fault?

**SECTION C**

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

- 12 What do you mean by internal fragmentation?
- 13 Write a note on various process states.
- 14 What are the necessary conditions for deadlock.
- 15 Explain the term demand paging.
- 16 Write a note on PCB.
- 17 Explain First-in-First-out Page Removal algorithm with suitable example.
- 18 What is resource allocation graph and explain with an example?

**SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

- 19 Discuss in detail three process scheduling algorithms.
- 20 Explain methods for handling dead lock.
- 21 Explain any four disk scheduling algorithms.

# 4B05CSC

## C# and .NET Programming

*Contact Hours/Week : Theory 3 Credit : 4*

### *Aim*

*To expose students to technology of .NET programming.*

### *Objectives*

*To expose students to current trends and styles in programming*

*To familiarize simple, modern, general-purpose, object-oriented programming language.*

### **Module I**

Introduction to C# - Evolution , Characteristics, applications. Understanding .NET- Origin of .NET Technology, .NET Framework, Common Language Runtime (CLR), .NET Approach. Overview of C#- Program Structure, A Simple C# Program, Namespaces, CommandLine Argument, Errors.

### **Module II**

Basic concepts of Programming: Literals, Variables, Boxing and Unboxing, Data types, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

### **Module III**

Object Oriented aspects of C# ,Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions, Multithreading.

### **Module IV**

Application Development on .NET Web Applications – Web form Fundamentals, Web form Events, Webform Life cycle, Creating a Web Application, Web Srvices. Windows Applications – Creating a Windows Application.

## Module V

Database Access and .NET Components Accessing Data with ADO.NET Assemblies, Versioning, Attributes, Reflection, Viewing Meta Data, Type Discovery, Reflecting on a type, Marshalling, Remoting.

### Text Books

1. Programming in C#, E.Balagurusamy (Unit I, II)
2. Programming in C#, J. Liberty 2<sup>nd</sup> Edition – O'Reilly (Unit III, IV, V)

### Reference

- 1 C# Programming Bible, Jeff Ferguson, Brian Patterson, Jason Beres, Wiley Publishing Inc., Reprint 2006.
- 2 Programming .Net , Jeff Prosise, , 2nd Edition, WP Publishers & Distributors Pvt. Ltd, 2009.
- 3 Professional .Net Framework , Kevin Hoffman & Jeff Gabriel, , 1<sup>st</sup> Edition, Wrox Press Publishers, 2006.

## Model Question Paper

### 4B05CSC C# and .NET Programming

Time: 3 Hours

Maximum Mark: 40

#### SECTION- A

1. **One Word Answer** **(8\*0.5= 4 Marks)**
  - a. C# is known as the first ..... language
  - b. MSIL means .....
  - c. .NET framework is one of the tools provided by .....
  - d. An inherent characteristic of IL code is .....
  - e. Value constant assigned to variable in a program is known as .....
  - f. The ability to take more than one form is known as .....
  - g. for is a ..... control loop.
  - h. Web pages can have both HTML and ..... controls



**SECTION- B**

**Write short notes on ANY SEVEN of the following questions (7\*2=14 Marks)**

2. State at least five most important highlight of c# language.
3. What is .NET Framework?
4. What is Common Type System?
5. What is method overloading?
6. What are arithmetic expressions?
7. What is Web Services?
8. What is .NET Assembly?
9. What is reflection?
10. What are Compile time errors?
11. What is containment inheritance?

**SECTION - C**

**Answer ANY FOUR of the following questions (4\*3=12 Marks)**

12. Discuss Enumeration with example?
13. Describe the structure of typical c# program.
14. What are private and shared assemblies?
15. Discuss differences between class and structure with example.
16. How does C# differ from Java ?
17. Explain webform events.

**SECTION- D**

**Answer ANY TWO of the following questions (2\*5=10 Marks)**

18. Explain the steps to develop a web application with a simple example.
19. Explain Webform life cycle.
20. Explain CLR and its Components.
21. Explain ADO .NET

## **4B06CSC Lab-II**

### **Programming with C++ & Data Structure**

*Practical Hours / Week: 2    Credit: 1*

#### Guidelines

- Follow standard coding method
- The output of the program should be neatly formatted
- Practice all the programs in the lab
- Practical recode consist any 15 programs from part A and B

The lab consist of two sections: A:Programming in C++ and B: Data Structures. Equal weightage will be given for both sections. For internal assessment, each part may be evaluated independently and final CA grade shall obtained by combining them. End semester examination question shall carry questions from both sections.

#### **Sample Program list**

##### Part A(C++)

1. Programme for class definitions and usage involving variety of constructors and destructors
2. Programs involving various kinds of inheritances,
3. Programs involving operator overloading and type conversions
4. Programs involving virtual base classes, friend functions
5. Programme to demonstrate early and late binding
6. Programme to allocate memory dynamically
7. Programme involving class and function templates
8. Programs to demonstrate (i) string processing (ii) file streams (iii) a variety of selected library functions
9. Programme for exception handling.
10. Programme for various matrix operations.

##### Part B (DS)

#### **Write C++ programs for the following:**

1. Queue operations.
2. Stack operation.
3. Add two polynomials
4. Insertion sort.
5. Binary and linear search.
6. Evaluation of postfix.
7. Quick sort
8. Singly linked list operations: add / delete / print / count.
9. Circular queue.
10. Tree traversal.
11. Merge two sorted linked lists.
12. Linked stack to reverse a string.
13. Singly linked list operations: search list, merge two lists.
14. Doubly linked list: add / delete nodes.
15. Linked stack to reverse a string.

#### **QUESTION PAPER PATTERN**

One question will be selected by the examiners from each part. Students have to write and execute both programs.

## **4B07 CSC Lab-III**

### **.NET Programming & DBMS**

**Practical Hours / Week:3    Credit: 2**

#### **Guidelines**

- *Follow standard coding method*
- *The output of the program should be neatly formatted*
- *Practice all the programs in the lab*
- *Include any ten programs from part A and B in practical recode*

**Note** *The lab consist of two sections: Programming in .NET and B: Data Base Management System. Equal weightage will be given for both sections. For internal assessment, each part may be evaluated independently and final CA grade shall obtained by combining them. End semester examination question shall carry questions from both sections*

#### **Sample Program List**

##### **Part A (.NET)**

1. To implement output parameter and reference parameter
2. To implement the concept of indexers
3. To implement the concept of sealed class
4. To implement the concept of namespace
5. To implement the concept of interfaces
6. To implement the concept of events
7. To implement exception handling
8. To design a calculator in windows form
9. To implement data controls in windows form
10. To implement validation controls in web form

##### **Part B (Data Base Management System)**

1. PostgreSQL
  - a. Introduction
  - b. Logging on to PostgreSQL
  - c. Creating Database
  - d. Accessing a Database
2. Data Definition Language (DDL)
  - a. Create, Drop Alter Keywords    b. Tables    c. Column    d. Views

3. Integrity Constraints
  - a. Types of Constraints
  - b. Referential Integrity
  - c. Defining Constraints
4. Data Manipulation Language (DML)
  - a. Insert b. Update c. Delete
5. Data Query Language
  - a. Selecting Columns
  - b. Duplicate Information (DISTINCT)
  - c. Sorting Information
  - d. Filtering Data Using Where
  - e. Group By and Having Functions
  - f. Aggregate Functions.
6. Retrieving Data from Multiple Tables
  - a. Joining Tables (Equi-Joins, Non-Equi-Joins, Self Join)
  - b. Aliases for Table Names
7. Sub-Queries
  - a. Basic Sub queries
  - b. Multiple Column Sub queries
  - c. Sub queries with Having
8. SQL Functions
  - a. The Concatenation Operator
  - b. Column Aliases
  - c. String Functions
  - d. Arithmetic Functions
  - e. Date Functions
9. Sequence
10. Functions and Triggers.

#### **QUESTION PAPER PATTERN**

One question will be selected by the examiners from each part. Students have to write and execute both programs.

# **5B08CSC**

## **Software Engineering**

**Contact Hours/Week: 3 Credit: 4**

***Aim:***

*To introduce the basic concepts of software engineering.*

***Objectives:***

1. *Understand the basic processes in software Development life cycle.*
2. *Familiarize with different models and their significance.*
3. *Approach software development in a systematic way.*
4. *To familiarize students with requirement engineering and classical software design techniques.*
5. *To familiarize with various software testing techniques and tools.*

**Module I**

Introduction to software engineering-Definition, program versus software, software process, software characteristics, brief introduction about product and process, software process and product matrices; Software life cycle models – Definition, waterfall model, increment process model, evolutionary process model, selection of the life cycle model.

**Module II**

Software Requirement Analysis and Specification – Requirements engineering, types of requirements, feasibility studies, requirement elicitation, various steps of requirement analysis, requirement documentation, requirement validation.

**Module III**

Software design – definition, various types, objectives and importance of design phase, modularity, strategy of design, function oriented design.

**Module IV**

Objected Oriented Design – Analysis, design concept, design notations and specifications, design methodology.

## Module V

Software Testing – What is testing, Why should we test, who should do testing? Test case and Test suit, verification and validation, alpha beta and acceptance testing, functional testing, techniques to design test cases , Boundary value analysis, equivalence class testing, decision table based testing, cause effect graphing techniques; structural testing, path testing, cyclomatic complexity, mutation testing, levels of testing, unit testing, integration testing, system testing, validation testing,

## Text Book

1. Software Engineering (Third Edition), K K Aggarwal, Yogesh singh, New age International Publication (For unit 1,2,3,5 and case study of unit 4)
2. An integrated approach to software Engineering (Second Edition ), Pankaj Jalote , Narosa Publishing House - (For Unit 4 )

## References:

1. Fundamentals of Software Engineering Rajib Mall PHI Publication
2. Software Engineering (Seventh edition), Ian Sommerville – Addison Wesley.
3. Software Engineering A practitioners approach (Sixth Edition), Roger S Pressman-Mc Graw Hill.
4. Fundamentals of Software Engineering (Second Edition), Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli – Pearson Education.

## Model Question Paper 5B08CSC Software Engineering

**Time: 3 Hours**

**Maximum Mark: 40**

### SECTION A

**1. One word answer**

**(8 x 0.5 = 4 marks)**

- a. \_\_\_\_\_ is the way in which we produce software.
- b. Expansion of CASE is \_\_\_\_\_
- c. Level 0 DFD is also called \_\_\_\_\_
- d. FAST stands for \_\_\_\_\_
- e. X and Y have no conceptual relationship other than shared code then the cohesion is called \_\_\_\_\_

- f. UML stands for \_\_\_\_\_.
- g. \_\_\_\_\_ is the process of executing a program with the intension of errors.
- h. \_\_\_\_\_ is the process of confirming that software meets the customers requirements.

### **SECTION B**

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. What is software process.
3. What is product matrices.
4. Write a note on SRS.
5. What is requirement validation.
6. Define Software design.
7. What is bottom up strategy of design.
8. What are the steps to analyze and design Object Oriented System.
9. Write a note on Abstraction.
10. What is test case and test suite.
11. Define white box testing.

### **SECTION C**

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. What are the important software characteristics?
13. Discuss about requirement elicitation.
14. Write a note on types of design.
15. What are the basic concepts of Object Oriented Design?
16. Write a note evolutionary data model.
17. Write a note on various levels of testing.

### **SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. Discuss Waterfall model in detail.
19. Explain various steps of requirement analysis.
20. Write a note on Module Coupling.
21. Explain various techniques to design test cases.

# 5B09CSC

## Web Technology

**Contact Hours / Week: Theory:2 Practical: 3 Credit: 3**

### *Aim*

*To introduce various tools and languages required for technical and creative design of state-of-the-art web sites.*

### *Objectives*

1. To enable students to program for the World Wide Web using HTML, JavaScript, PHP and MySQL.
2. To create static and dynamic web pages PHP and My SQL.
3. To impart basic knowledge in relational databases, SQL and , Client-server model.

### **Module I**

Introduction to Internet and WWW, Introduction to HTML, structure of HTML, HTML elements, attributes, syntax of tags , starting and ending tags, physical style tags, listing, labeling, grouping, images and linking

### **Module II**

HTML Tables-tags-<tr>,<td>,<th> attributes. HTML Form-tag, attributes-type-passwd,submit,radio,check,method,action.Frame-<frame>, <frameset>, <iframe>,<noframe> and other important tags and attributes.

### **Module III**

Javascript- Introduction, data types, variables, operators, functions, objects, arrays. Client-side object hierarchy and document object Model, <script>, event handlers, javascript in urls. Windows and frames-dialog boxes, status line, navigator object, opening Windows, closing windows, Location object, history object.- Date object-math object- Accessing form object.

### **Module IV**

Introduction to PHP, advantages of PHP, PHP basics- operators and Flow Control, strings and arrays, creating functions.

### **ModuleV**

Objects, Web Techniques, HTTP Basics, Databases, Using PHP to access database, relational databases and SQL, Client-server model.



**Text Books:**

1. HTML-Definitive Guide O'reilley 5<sup>th</sup> edn
2. Javascript-Definitive Guide O'reilley 6<sup>th</sup> edn
3. Programming in PHP O'reilley

**Reference:**

1. Complete reference in PHP-Steven Hozner
2. Beginning PHP5 (Wrox Programmer)
3. Complete reference HTML-Tata McGraw Hill
4. Programming the World Wide Web, Robert W Sebesta, Pearson Publications
5. Web enabled commercial application development using HTML,DHTML,JavaScript, Perl CGI – Ivan Bayross, BPB publications

## Model Question Paper

### 5B09CSC - Web Technology

**Time: 3 Hrs**

**Max. Marks: 40**

#### SECTION A

1. **One word Answer** **(8 x 0.5 = 4 marks)**
  - a. HTML files are sent and received using -----protocol.
  - b. Which tag is used for labeling?
  - c. Action is an attribute of .....tag.
  - d. The tag used to make hyper link is .....
  - e. Which tag is used to embed java script codes within HTML page?
  - f. The dialog box used for getting some input from the user is created using .....
  - g. HTML stands for.....
  - h. The statement used to print in PHP is .....

### **SECTION B**

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. Write a note on WWW.
3. What is the structure of an HTML document?
4. What is meant by a form? What are the important attributes of <form> tag?
5. Write a note on Javascript.
6. Explain arrays in JavaScript.
7. What is meant by events and event handlers?
8. What is meant by DOM?
9. What is meant by client server model?
10. Write the code for inserting an image to the web page.
11. What are the different methods to access databases from PHP?

### **SECTION C**

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. Differentiate between Get and Post.
13. Explain functions in PHP.
14. What are the different types of flow control statements in PHP?
15. List and explain any four physical style tags with examples.
16. What are the different types of dialog boxes?
17. What is meant by relational databases?

### **SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. What is the importance of HTTP in web? Explain the HTTP request response cycle.
19. What is meant by Table? What are the tags used for table creation? What are the different attributes? Illustrate with an example.
20. Design an application form with suitable controls and buttons. Make it dynamic using scripts.
21. Design a webpage for your college with frames, images and suitable hyper links.

# 5B10CSC

## Java Programming

*Contact Hours/Week : Theory: 3 Practical: 3 Credit: 4*

### *Aim*

*To expose the students to the basic features of Java programming language*

### *Objectives:*

- 1. To review Object Oriented Programming concepts.*
- 2. To learn concept of Object Oriented Programming using Java*
- 3. To develop skill in java programming.*

### **Module I**

Introduction to Java programming: Java history; features of java; Java Applets and Application, Byte Code; Over view of Java, Java Language fundamentals: Building blocks; Data types; variables And Arrays. Operators- Arithmetic, Bitwise, Relational, Boolean Logical, Assignment; Control statements;

### **Module II**

Introducing Classes: Class fundamentals; Introducing methods; Constructors; This keyword; Garbage collection; A closer look at methods and classes; Inheritance basics; Using Super; When Constructors are called; Method Overriding; Dynamic method dispatch; Abstract classes; Uses of final keyword. Packages: Introduction- Creating a Package- CLASSPATH; Accessing a package-simple program using package; Interfaces: definition- extending interface- implementing interface- simple programs using interface.

### **Module III**

Exception handling: Basics; handling exceptions in java; (Try, catch, finally, multiple catch, nested try, throw); multithreading: introduction- Creating threads; thread life cycle; thread Priorities, Synchronization.

### **Module IV**

Applets : Fundamentals [page-328]; Applet skeleton [pg-632], Applet differ from Application- Building Applet code; Working with Applets; The HTML APPLET tag; Sample programs using Applet.

## Module V

The Abstract Window Toolkit:- AWT classes; AWT controls (Labels, Buttons, checkbox, radio buttons; choice control; list, textbox, scroll bars), Delegation event model [Pg-654]. JDBC/ODBC Bridge Driver; Working with JDBC using JDBC/ODBC driver; Simple Program using database.

### Text book :

1. Java 2 The complete Reference, Schildt, McGraw Hill

### Reference:

1. Programming with java: A primer, 3<sup>rd</sup> Edn; E. Balaguruswami; McGraw Hill
2. Object Oriented Programming through JAVA, Radha Krishna, University Press.
3. Programming with JAVA a primer, E Balagurusamy, 4<sup>th</sup> Edition Tata McGraw-Hill.

## Model Question Paper 5B10CSC Java Programming

Time: 3 Hrs

Max. Marks: 40

### Section A

#### 1. One word Answer

(8 x 0.5 = 4 marks)

- a. The output of Java compiler is \_\_\_\_\_
- b. The width in bite of short data type is\_\_\_\_\_
- c. A variable can be declared as constant in java using\_\_\_\_ keyword.
- d. The variable declared as protected have access by subclass of different packages. Say true or false.
- e. All exceptions are subclasses of built in class \_\_\_\_\_
- f. You can create thread in Java by implementing \_\_\_\_\_ interface.
- g. \_\_\_\_\_ is the default layout manager.
- h. \_\_\_\_\_ is the method used to get number of items in a choice control.

**SECTION B**

Write short notes on **ANY SEVEN** of the following questions (7 x 2 = 14 marks)

2. How to create and use an one dimensional array in Java?
3. Define an applet.
4. Explain how to declare an object and define a class.
5. Syntax of try \_\_\_\_ catch statement with multiple catch.
6. Short note on thread groups.
7. Explain APPLET tag.
8. Write about any two methods of button class.
9. Short note on Database MetaData object.
10. Short note on StringBuffer class
11. Explain any two string operations in Java

**SECTION C**

Answer **ANY FOUR** of the following questions (4 x 3 = 12 marks)

12. Write a Java program to illustrate single level inheritance.
13. Short note on Thread Priorities in Java.
14. Write an overview of filter streams in Java.
15. What do you mean by event listeners in Java?
16. What are the advantages of inheritance in programming?
17. Explain exception handling in Java.

**SECTION D**

Write an essay on **ANY TWO** of the following questions (2 x 5 = 10 marks)

18. Write a program to matrix multiplication.
19. Explain how to create and use statement object in Java.
20. What is the purpose of throw statement in java?
21. Write a Java program to create a thread by extending thread class.

# **5B11CSC**

## **Linux Administration**

*Contact Hours / Week: Theory: 3 Practical: 2 Credit: 3*

### **Aim**

*To familiarize Linux working environment and system administration .*

### **Objectives**

1. *Introduce Linux working environment*
2. *Understand how install and configure Linux*
3. *Learn how to write shell scripts*
4. *Learn the architecture of Linux kernel and how resources are managed in Linux*

### **Module I**

Features and benefits of Linux- basic concepts of multi user system-open source, freedom-Linux-components of Linux, types of users in Linux, types of files. Introduction- login, password, creating an account, shell and commands, logout,changing password- files and directories-pathname-directory tree-current working directory-referring home directory-creating new directories,copying files,moving files,deleting files and directories- types of shell-wild cards-hidden files- looking at files: cat, more-online help:man.

### **Module II**

Vi editor-different modes-command mode, insert mode, last line mode- redirecting input/output-filter, pipes, file permissions, user, group, changing file permissions - mounting floppy,HDD, CDROM-file systems-structure of /etc/fstab- Bourne shell scripts: script execution-variables and parameters, if, for, case, while constructs.

### **Module III**

Linux Administration: Introduction-various parts of the OS-kernel, system program, application program, system calls-important parts of the kernel Boot process: booting-LILO boot process,/etc/lilo.conf, GRUB, /etc/grub.conf-runlevelsGUI,X windows-rc files, startup scripts.

## Module IV

Major services in linux system : init,/etc/inittab file -login from terminal3, syslog-periodic command execution: at and cron, crontab file System configuration files:/etc/sysconfig/.....files,keyboard,mouse etc System security: password,/etc/passwd file-shadow password,/etc/shadow-file permissions, chmod and umask-adding and deleting users-host security, tcp wrappers,/etc/host.allow, /etc/host.deny.

## Module V

System Maintenance: tmpwatch-logrotate-basic system backup and restore operation-Basic shell configuration for bourne and bash shell : /etc/profile,~/.bashrc,~/.bash\_profile. Linux Installation :Partitioning, MBR, SWAP, filesystem managing-different packages, rpm-installation of packages-starting and stopping different services.

### Text Book

Unix Shell Programming, Yeshwanth kanethkar

### Reference:

1. Unix in a nutshell,by Daniel Gilly, O'Reilly & Associates
2. Linux Administration handbook, Nemeth, PHI
3. Essential System Administration, O'reilly & Associates.
4. Red Hat linux Bible.
5. A user guide to the unix system, Thomas,Yates Tata McGraw Hill

## Model Question Paper 5B11CSC Linux Administration

**Time: 3 Hrs**

**Max. Marks: 40**

### SECTION A

#### 1. One Word Answer

**0 .5X8=4 Marks**

- a. The command used to rename a file in Linux is \_\_\_\_\_
- b. What is the PID of the Kernel process?
- c. The default run level with GUI in Linux is\_\_\_\_\_
- d. \_\_\_\_\_ process is termed as the parent of all process in Linux
- e. GRUB stands for\_\_\_\_\_.
- f. Name the directory that stores system configuration files in Linux
- g. The GUI of Linux is termed as\_\_\_\_\_.
- h. \_\_\_\_\_command is used to switch one runlevel to another

### SECTION B

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. What are the procedure for adding new users in Linux
3. Write a note on X window system
4. How shadow password provides additional security ti Linux users?
5. What are the contents of /etc/grub.conf file?
6. Explain the output of ls -l command.
7. How to schedule a job using cron.
8. Explain system log messages
9. How to compress a file in Linux?
10. How to manage process in Linux using ps command?
11. Write a note on shell configuration files

### SECTION C

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. Write a shell program to find whether a number is odd or even
13. What are run levels?. Explain briefly
14. What are the seven types of files supported by Linux OS.
15. How the host based security is achieved in Linux
16. Write a note on kernel module management
17. How to mount and unmount file systems in Linux

### SECTION D

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. What are the features of Linux Operating system
19. Explain briefly how the back up and restore operations can be done in Linux.
20. What are the basic permissions available to files in Linux? How to set that using Linux? How we can change that permissions?
21. Explain briefly the steps in installing Linux OS



# **6B13CSC**

## **System Software**

*Contact Hours / Week: Theory: 4 Credit: 3*

### *Aim*

*To introduce the fundamental concepts of system software*

### *Objectives:*

1. *Introduce formal language processing activities.*
2. *Basic idea of assembly language programming and role of assembler.*
3. *Insight into Design of assemblers and macro processors.*
4. *Concept of Macros and Macro preprocessors.*
5. *Overview of various aspects of compilers.*

### **Module I**

System software, Introduction to language processor, language processors, Fundamentals of language processing, Introduction to machine structure, Machine and assemble languages.

### **Module II**

Assembler- Design of an assembler Elements of assembly language programming, Pass structure, Format of data structure

### **Module III**

Loader and linkers: Functions of Loader and Linker, Programme relocation, Loading and linking schemes, Compile and Go, General loader scheme, Absolute loader, Subroutine linkage, direct linking . dynamic linking, overlay structure.

### **Module IV**

Fundamentals of Language specification, Formal language grammar, Derivation Reduction and parse tree, Classification of Grammars, Ambiguity of grammatical specification, Scanner and scanning, Parsing

## Module V

Compilers: introduction, passes of a compiler, Aspect of compilation, Compilation of expression, Compilation of control structures, intermediate representation, code optimization

### Text Books:

System Software and Operating system –TMH - By D M Dhamdhare

### References

System Programming –TMH- By John Donovan

System software and distributed Computing by ABBAS T P

## Model Questions

### 6B13CSC System Software

**Time: 3 Hrs**

**Max. Marks: 40**

#### SECTION A

#### 1. One Word Answer

**0.5X8=4 Marks**

- a) \_\_\_\_\_ is a finite sequence of symbols.
- b) Mnemonic operation codes are found in \_\_\_\_\_
- c) \_\_\_\_\_ govern the information of valid lexical units in the source language.
- d) The process of isolating lexical units of a sequence is called \_\_\_\_\_
- e) The \_\_\_\_\_ direct the assembler to take certain actions during the process of assembling a program.
- f) Addresses are kept track by using a \_\_\_\_\_
- g) \_\_\_\_\_ is the semantic gap between two specifications of the same task.
- h) Intermediate code generation phase gets input from \_\_\_\_\_

**SECTION B**

**Write short notes on ANY SEVEN of the following questions (7\*2=14 Marks)**

2. What is an assembler
3. What is an absolute loader
4. How grammars are classified
5. What is parsing
6. Define the term formal language
7. What is an over lay
8. What is meant by code optimization
9. What are the functions of loader
10. Describe compilers phases
11. Describe top down and bottom up parsing

**SECTION – C**

**Answer ANY FOUR of the following questions (4\*3=12 Marks)**

12. What is meant by ambiguity in grammar specification
13. Describe the design of absolute loader
14. Explain the compilation of an expression
15. Explain the code optimizing transformation
16. Explain the functions of Linker and Loader
17. How grammars are classified

**SECTION- D**

**Answer ANY TWO of the following questions (2\*5=10 Marks)**

18. Explain in details about Compiler and it phases
19. Explain the concept of code optimization in details
20. What is an assembler? Explain its design
21. Explain the compilation of control structure

# **6B14CSC**

## **Data Communication & Networks**

*Contact Hours / Week: 4 Credit: 3*

### *Aim*

*To introduce various components used in a data communication system*

### *Objectives*

1. *To understand state-of-the-art in network protocols, architectures and application.*
2. *To acquire knowledge about different computer networks.*
3. *To understand the use of layer architecture for networking systems.*

### **Module I**

Introduction to data communication, important elements /components of data communication, Data transmission- Analog, Digital. Transmission media- Guided media, Unguided media. Synchronous / Asynchronous data transmission. Line configuration – Simplex, Half duplex, Duplex. Network topologies – star, Bus, ring, Mesh. Computer networks, Use, network hardware, network structure- point to point connection, multicast, broadcast, classification of networks-LAN, WAN, Man.

### **Module II**

Reference models, the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / Ip models. Data Link Layer , Design issues, Services to network layer, Framing- character count, character stuffing, bit stuffing, physical layer coding violation. Error control, flow control, Elementary data link protocols- unrestricted simplex protocol, simplex stop and wait protocol, simplex protocol for a noisy channel.

### **Module III**

Network layer, design issues, services to the transport layer, routing algorithms- adaptive, non adaptive algorithms, optimality principle, dijkstras shortest path routing algorithm, flow based routing, hierarchical routing, congestion control algorithms–the leaky bucket algorithm, the token bucket algorithm.

**Module IV**

Transport layer, design issues, connection management-addressing, establishing and releasing connection, transport layer protocols- TCP, UDP.

**Module V**

Application layer, network security, traditional cryptography, substitution ciphers, transposition ciphers, fundamental principles, secret key algorithm, data encryption standard, DES chaining, DES breaking. Public key algorithm, RSA algorithm.

**Text Book**

A S Tanenbaum . Computer Networks 3<sup>rd</sup> Edn Pearson Pub.

**References**

1. B Forousan, Introduction to data communication and networking
2. Data communication and Networks, Achyut S. godbole, TMH
3. Computer Networks – fundamentals and Applications, Rajesh, Easarakumar & Balasubramaian, Vikas pub.

## Model Question Paper 6B14CSC Data Communication & Networks

**Time: 3 Hours**

**Maximum Mark: 40**

### SECTION- A

**1. One Word Answer**

**(8 X 0.5 = 4 marks)**

- a. The transfer of data in the form of electrical signals or continuous waves is called \_\_\_\_\_.
- b. The \_\_\_\_\_ is in between each pair of adjacent layers and defines the primitive operations and \_\_\_\_\_ services of the lower layer.
- c. The \_\_\_\_\_ protocol has neither flow control nor error control.
- d. The network layer deals with \_\_\_\_\_ transmission.
- e. The coding of data for security is called \_\_\_\_\_.
- f. In TCP the connection is established using a technique called \_\_\_\_\_.
- g. OSI stands for \_\_\_\_\_.
- h. The hierarchical routing uses the idea of dividing routes called \_\_\_\_\_.

**SECTION B**

**Write short notes on ANY SEVEN of the following questions (7 X 2 = 14 Marks)**

2. What are the design issues of network layer?
3. What is meant by congestion?
4. What is cryptography?
5. List the file transfer protocols.
6. What is the need of error control?
7. What is meant by character stuffing?
8. Explain simplex transmission.
9. Define a computer network.
10. What is meant by parallel transmission?
11. What is service point addressing?

**SECTION C**

**Write short notes on ANY FOUR of the following questions (4 X 3 = 12 Marks)**

12. Explain transposition ciphers.
13. Compare between TCP and UDP.
14. Explain flow based routing.
15. Explain Framing.
16. What are the functions of presentation layer?
17. Briefly explain unicast, muticast and broadcast.

**SECTION D**

**Write short notes on ANY SEVEN of the following questions (2 X 5 = 10 Marks)**

18. Explain ISO-OSI reference model.
19. List and explain elementary protocols used in DLL.
20. Explain different types of routing.
21. Explain the various methods for providing network security.

## 6B15CSC

### Computer Organization

*Contact Hours/Week : 3 Theory Credit: 3*

#### **Aim**

*To impart knowledge in the functional organization of a computer system.*

#### **Objectives**

- 1. To introduce the basic terminology of computer hardware.*
- 2. To familiarize the functional units of a computer system.*
- 3. To understand the basic operation of a computer system.*
- 4. To understand the memory organization in a computer system.*

#### **Module I**

Basic structure of computer-Types of computers-Functional Units-Basic operational Concepts-Bus structure-Multiprocessors and Multi computers-Data representation-Fixed Point representation and floating Point representation.

#### **Module II**

Register Transfer and Micro operations – Register Transfer language-Register Transfer-Bus and memory Transfer-Three state bus buffers-Memory Transfer-Basic Computer Organization and Design – Instruction Codes – Fetch & Decode Instructions – Register Reference Instructions – Memory Reference Instruction – Input output & Interrupt.

#### **Module III**

Micro Programmed Control – Control Memory – Address sequencing – Central Processing Unit – General Register Organization – Control word – Stack Organization – Register stack - Memory Stack – Reverse Polish notation – Evolution of Arithmetic expressions – Instruction Formats – Addressing modes – Data Transfer and Manipulations – reduced Instruction set computer(RISC)

#### **Module IV**

Input Output Organization – Peripheral Devices – Input/Output Interfaces – Asynchronous Data Transfer – Modes of transfer –Priority Interrupt – Direct Memory Access (DMA) - Input Output Processor - Serial Communications.

**Module V**

Memory Organization – Hierarchy – Main memory – Auxiliary Memory – Associative Memory – Cache memory – Mapping – Multiprocessors – Characteristics of multiprocessors - Inter connection structures – Inter Processor Arbitration.

**Text Books**

1. Computer system Architecture –M.Morris Mano - PHI Pvt Limited
2. Computer Organization - Carl Hamacher –International Edition

**References**

1. Computer Organization and Architecture, William Stallings, 7th Edn, Pearson Education.
2. Computer Architecture & Organization John P Hayes –Mc Graw Hill

## Model Question Paper 6B15CSC Computer Organization

**Time: 3 Hrs**

**Max. Marks: 40**

**SECTION A**

1. **One word answer** **(8 x 0.5 = 4 marks)**
- a) The type of the addressing mode in which the effective address is equal to the address part of the instruction is .....
  - b) The register that hold the address of the stack is.....
  - c) The data register is some times called.....
  - d) The transfer of information from a memory word to outside environment is .....
  - e) The third state of three state bus buffer is .....
  - f) Which condition can be detected by observing the carry into the sign bit position and the carry out sign bit position.....
  - g) If the most significance digit of mantissa of floating point number is non zero then the number is said to be .....
  - h) The register that keeps track of address of the instruction is to be executed is called .....



**SECTION B**

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

- 2 Explain the relative address mode
- 3 What are the difference between the multiprocessors and multi computers?
- 4 Explain floating point representatives.
- 5 What is a register transfer?
- 6 What is an effective address?
- 7 Write three memory references instructions.
- 8 What is an interrupt cycle?
- 9 What are the major phases of operation of control unit when go through an instruction cycle?
- 10 What is RISC?
- 11 Explain base register address Mode.

**SECTION C**

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. Explain base register address mode
13. Explain different Auxiliary Memory types
14. Explain 2's complement addition and 2's complement subtraction.
15. Explain address sequencing
16. What is the general register organization?
17. Explain the register indirect mode.

**SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. Explain the fixed point and floating point representation
19. Explain the direct memory access in detail.
20. Explain different addressing modes.
21. Write a detailed note on instruction cycle describing the various steps involved.

## **6B17CSC Lab-IV**

### **Java & Shell Programming**

*Practical Hours / Week: 3    Credit: 2*

#### **Guidelines**

- Follow standard coding method
- The output of the program should be neatly formatted
- Practice all the programs in the lab
- Include any ten programs from part A and B in practical recode

The lab consist of two sections: A:Programming in Java Programming and B: Shell programming Equal weightage will be given for both sections. For internal assessment, each part may be evaluated independently and final CA grade shall obtained by combining them. End semester examination question shall carry questions from both sections.

#### **Sample Program List**

##### **Part A Java)**

1. Write a java program to perform various string operations using java class.
2. Write java program to implement interface.
3. Write java program that handles various exceptions. Use try –catch statement.
4. Write java program to implement file I/O operation using java iostreams.
5. Write java program to implement Applet life cycle.
6. Write java program to implement a calculator using suitable AWT controls.
7. Write java program to implement menus and popup menus
8. With API suport write demo programs for menu display
9. Write a java program to demonstrate threads.
10. Demonstration of static variables and methods.
11. Illustration of packages.
12. Implementation of multithreading by extending Thread class
13. Creation of applets and passing parameters to applets.
14. Demonstration of FileInput Stream and FileOutput Stream Classes
15. Create web page using HTML with frames.

**Part B (Shell Programming )**

1. Shell Script Program to perform all Arithmetic operations
2. Shell Script Program to find simple interest
3. Shell Script Program to find Area of Square, Rectangle, Circle
4. Shell Script Program to print your Address 'n' times
5. Shell Script Program to find whether number is even or odd
6. Shell Script Program to find whether number is +ve, -ve or 0
7. Shell Script Program to find Greatest of 3 numbers
8. Shell Script Program to whether year is Leap year or not
9. Shell Script Program to print natural numbers from 1 to 10 using WHILE loop
10. Shell Script Program to print perfect numbers from 1 to 100
11. Shell Script Program to reverse a number
12. Shell Script Program to find whether the given number is perfect or not

**QUESTION PAPER PATTERN**

One question will be selected by the examiners from each part. Students have to write and execute both programs.

# **6B18CSC Lab-V**

## **Web Technology**

**Practical Hours / Week:2    Credit: 2**

### **Guidelines**

- Follow standard coding method
- The output of the program should be neatly formatted
- Practice all the programs in the lab

### **Sample Program list**

1. Develop an HTML page using all basic tags
2. Develop an HTML page containing all types of lists
3. Write an HTML code to insert an image into the web page. Use the attributes height, width and border. Also align some text with respect to the images
4. Create a web page giving the following train details in a tabular form with the heading Train Time Table.  
Train name, starting place, destination, arrival and departure time and fare
5. Create an HTML page with images. Clicking on the images should lead to external documents.
6. Form Validation using Java Script
7. Create a web page for your college using frames, images and hyper links
8. Create an email registration form. Give necessary validations
9. Write a JavaScript code using arrays
10. Create a web page that illustrate the onMouseOver and onMouseOut event handlers
11. Develop an HTML page that accepts any mathematical expression, evaluates that expression and display the result of the evaluation
12. Write a Javascript program to display the current time
13. Write a Javascript program to print the prime numbers within a range
14. Write a Javascript program to show the working of alert()
15. Write a JavaScript program to find the factorial of a number.
16. Form Processing using PHP
17. Form validation using PHP
18. Storing data in MYSQL using PHP

### **QUESTION PAPER PATTERN**

One question will be selected by the examiners. Students have to write code and execute the program.

# 6B19CSC

## Project

**Theory 02 Lab Hours 03/ Week**

**Credit 5**

### ***Project Guidelines***

The minimal phase for the project are: project search finalization and allocation, investigation of system requirement data and process Modeling system design program design, Program coding and Testing Procedures done, and system implementation procedures.

### **Project planning:**

The B.Sc (Computer Science) Major Project is an involved exercise, which has to be planned well in advance. The topic should be chosen in the beginning of final year itself. Related reading training and discussions first internal project viva voce should be completed in the first term of final year.

### ***Selection of the project work***

*Project work could be of three types.*

#### **a) Developing solution for real life problem**

In this case a requirement for developing a computer-based solution already exists and the different stages of system development life cycle is to be implemented successfully. Examples are accounting software for particular organization, computerization of administrative function of an organization, web based commerce etc. The scope for creativity and exploration in such projects is limited but if done meticulously valuable experience in the industrial context can be gained.

#### **b) Innovative Product development**

These are projects where a clear-cut requirement for developing based solution may not exist but a possible utility for same is conceived by the proposer. An example is a Malayalam language editor with spell checker, hand written character processing.

### **c) Research level project**

These are projects which involve research and development and may not be as structured and clear cut as in the above case. Examples are Malayalam character recognition, Neural net based speech recognizer etc. This type of projects provides more challenging opportunities to students, but at B.Sc level this may be a difficult choice. If any student identifies proper support in terms of guidance technology and reference from external organizations and also the supervisors are convinced of the ability of the student(s) to take up the project it shall be permitted. The methodology and the reporting of such project could be markedly different from type (a) and is left to the proposer/external supervisor of the project.

#### **Selection of team**

To meet the stated objectives, it is imperative that major project is done through a team effort. Though it would be ideal to select the team members at random and this should be strongly recommended, due to practical consideration students may also be given the choice of forming themselves into teams with three or four members. A team leader shall be selected. Team shall maintain the minutes of meeting of the team members and ensure that tasks have been assigned to every team member in writing. Team meeting minutes shall form a part of the project report. Even if student are doing project as groups each one must independently taken different modules of the work and must submit the report.

#### **Selection of Tools**

No restrictions shall be placed on the students in the choice of platform / tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of tools in the evaluation of the project.

#### **Selection of external organization & Guide.**

No restriction shall be placed on the student in the choice of external organization, where project work may be done, in terms of locality type (Private/ public) etc. It is the duty of the Head of Institution / Principal of the college to ensure that the aims, objectives and full project guidelines are communicated to the external organization. The guide should ideally be a postgraduate with work experience.

Students may also choose to do project in the college/institute especially product based work but in such cases the supervisors must ensure that

- (I) Industry practices are followed
- (II) the student undertake a planned visit to an IT industry with international operations to make up for the loss of experience
- (III) the service of an external guide with industry experience is obtained.

### **Project management**

Head of the institute /principal of the college should publish the list of students project topic, internal guide and external organization and teams agreed before the end of July. Changes in this list may be permitted for valid reasons and shall be considered favourably by the Head of the institute /principal of the college any time before commencement of the project. Students should submit a fortnightly report of the progress, which could be indication of percentage of completion of the project work. The students should ideally keep a daily activity book. Team meeting should be documented and same should be submitted at the end of the project work.

### **Documentation**

Three copies of the project report must be submitted by each student ( one for department library, one for the organization where the project is done , one for the external examiner and one for the student himself/herself). After affixing signature of external examiners two copies will be returned at the time of the viva which are for the external organization and for the candidate. A CD containing soft copy of the project report, source code and binaries recorded in different folders should also be submitted for the documentation in the library. The CD also should bear the name of the student , title of the project, year etc. the format for preparation of the project is standaeized from 2007 onwards. The following are the major guidelines. The final outer dimensions of the project report shall be 21cm X30 cm.the colour of the flap cover shall be light green/blue. Only hard binding should be done, with title of thesis and the words "<BRIEF TITLE> BSc(CS) Project Report 201..."displayed on the spine in 20 point , bold , Arial, as in example below. In case the title is too long, a shorter version of it may be used.

- The text of the report should be set in 12 pt , bookman , 1.5 spaced.
- Headings should be set as follows: CHAPTER HEADINGS 20 pt, Arial, Bold, All caps, Centered.

1. Section Headings 14 pt Bookman old style, Bold, Left adjusted.

Section Sub-heading 12 pt, Bookman old style.

Title of figures tables etc are done in 12 point, Times New Roman, Italics, centered.

Content of the Project should be relevant and specify particularly with reference to the work. The report should contain the requirement specification of the work, Analysis, Design, Coding, testing and Implementation strategies done.

- Organizational overview (of the client organization, where applicable)
- Description of the present system
- Limitations of the present system
- The Proposed system- Its advantages and features
- Context diagram of the proposed system.
- Top level DFD of the proposed system with at least one additional level of expansion
- Menu Tree
- Program List (Sample code of major functions used)
- Files or tables (for DBMS projects) list. Class names to be entered for each file in OO systems.
- List of fields or attributes (for DBMS projects) in each file or table.
- Program – File table that shows the files/tables used by each program and the files are read, written to, updated, queried or reports were produced from them.
- Screen layouts for each data entry screen.
- Report formats for each report.

#### **Some general guidelines on documentation are:**

1. Certificate should be in the format :” **Certified that this report titled.....is a bonafide record of the project work done by Sri/ Kum .....under our supervision and guidance, towards partial fulfillment of the requirement for award of the Degree of B.Sc Computer Science of the Kannur University”** with dated signature of internal guide, external guide and also Head of the Department/ College.



2. If the project is done in an external organization, another certificate on the letterhead of the organization is required: **“Certified that his/her report titled .....is a bonafide record of the project work done by Sri/Kum.....under my supervision and guidance, at the .....department of..... (Organization) towards partial fulfillment of the requirement for the award of the Degree of B.Sc (Computer Science) of the Kannur University.**

3. Page numbers shall be set at right hand bottom, paragraph indent shall be set as 3.
4. Only 1.5 space need be left above a section or subsection heading and no space may be left after them.
5. References shall be IEEE format ( see any IEEE magazine for detail) While doing the project keep note of all books you refer, in the correct format and include them in alphabetical order in your reference list.

There shall be six components that will be considered in assessing a project work with weightage as indicated.

- Timely completion of assigned tasks as evidenced by team meeting minutes 20% or 4 marks
- Relevance of topic System study / Design of table/Individual involvement, team work and adoption of industry work culture 20% or 4 marks
- Project report Quality of project documentation (Precision, stylistics etc )/Achievement of project deliverables 30% or 6 marks
- Viva Effective technical presentation of project work 30% or 6 marks

Based on the above 6 components internal mark (20)can be awarded.

Dissertation /Project to be submitted at the end of third year shall be valued by two examiners appointed by University for the conduct of practical exam. The board of examiners shall award 80 marks based on the following components given in the table below.

| <b>External ( 80% of Total)</b>                                          |                   |              |
|--------------------------------------------------------------------------|-------------------|--------------|
| <b>Components</b>                                                        | <b>% of Marks</b> | <b>Marks</b> |
| Writing Synopsis/ Abstract                                               | 12.5              | 10           |
| Content of the Report                                                    | 12.5              | 10           |
| Quality of project work/Use of software/ tools                           | 12.5              | 10           |
| Perfection of the work done<br>(Designs of tables/ Input & Output forms) | 25                | 20           |
| Live demo                                                                | 12.5              | 10           |
| Viva-Voce                                                                | 25                | 20           |
| <b>Total</b>                                                             | <b>100</b>        | <b>80</b>    |

# ELECTIVE AND OPEN COURSE

# 5B12CSC - E01

## Algorithm Analysis and Design

Contact Hours/Week: Theory :4 Credit: 4

### Module I

Introduction- Definition of algorithm, Areas of algorithm study, performance analysis, Time and space complexity, asymptotic notations ( $O$ ,  $\Omega$ ,  $T$ ).

### Module II

Divide and Conquer – general method, Binary search, Finding the maximum and minimum, Merge sort, Quick sort, Performance measurement of quick sort, selection, Strassen's matrix multiplication.

### Module III

Greedy method – General method, knapsack problem, job sequencing with deadlines, minimum cost spanning trees, prims algorithm, kruskals algorithms, optimal merge patterns, single source shortest path, optimal binary search trees.

### Module IV

Dynamic programming – General method, multistage graph, allpairs shortest path, single shortest path, 0/1 knapsack travelling sales person problem.

### Module V

Basic traversal and Search techniques – Breadth First Search and traversal, Depth First Search and Traversal, Bi-connected components and DFS; Backtracking – General methods, 8-queens problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

### Text Book:

1. Ellis Horowitz, Sartaj Sahni, S Rajasekharan – Computer Algorithms/C++ - Second Edition, Universities press, 2008 (Paperback Edn)

### Reference:

1. Introduction to the design and Analysis of Algorithms, Anany Levitin, 2nd Edn, Pearson education.
2. The design and analysis of computer Algorithms Alfred V Aho John E Hopcroft Pearson Education

# 5B12CSC - E02

## Computer Graphics

**Contact Hours/ Week : Theory : 4      Credit : 4**

### Module I

Introduction, Overview of Graphics Systems, Display devices, Input devices, Hard-Copy devices, Graphics software.

### Module II

Line Drawing Algorithms-DDA, Bresenham, Circle Generating Algorithm – Midpoint Algorithm, Area filling algorithms – Flood Fill and Boundary Fill algorithms.

### Module III

Output primitives-Color and Grayscale levels, 2D Transformations-Translation, Rotation, Scaling, Reflection, Shear, Matrix Representation and Homogenous Coordinates, Composite Transformations.

### Module IV

Two Dimensional viewing, Window-to-viewport Transformation, Clipping - Point Clipping, Line Clipping – Cohen Sutherland Algorithm, Polygon Clipping – Sutherland Hodgeman Algorithm, Text clipping.

### Module V

3D object representations-Polygon surfaces, Polygon tables, Plane equations, Polygon Meshes, 3D transformations-Translation, Rotation, Scaling, Rotation about an arbitrary axis, Reflection, Shear, 3D viewing- Parallel Projection, Perspective Projection.

#### Text Book

1. Donald Hearn and M.Pauline Baker, “Computer Graphics-C Version”, Second Edition, Pearson Education, 2005.

#### References

1. Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", 2nd edition in C, Pearson Education, 2005
2. Ranjan Parekh, "Principles of Multimedia", ,Tata McgrawHill,2006
3. D.P. Mukherjee, "Fundamentals of Computer Graphics and Multimedia", PHI.
4. "Procedural elements of Computer Graphics", Rogers, Mc-Graw Hill.

# 5B12CSC – E03

## Data Mining

**Contact Hours / Week : Theory: 4 Credit : 4**

### Module I

Introduction; data warehousing – what is, Multidimensional data model, OLAP operations, warehouse schema, Data warehousing Architecture, warehouse server, Metadata, OLAP engine, data warehouse Backend Process.

### Module II

Data mining – what is, KDD vs data mining, DBMS vs data mining, DM Techniques, issues and challenges, Applications. (Case studies)

### Module III

Association rules – What is, Methods, a priori algorithm, partition algorithm, Pincer- search algorithm, FP-tree growth algorithm, incremental and Border algorithms, Generalized Association rule.

### Module IV

Clustering techniques – Paradigms, Partitioning Algorithms, k – Medoid algorithms, CLARA, CLARANS, hierarchical clustering, DBSCAN, Categorical Clustering, STIRR.

### Module V

Decision trees – what is, tree construction principles, Best split, Splitting indices, Splitting criteria, decision tree construction algorithms, CART, ID3, C4.5, CHAID. Introduction to web, spatial and temporal data mining.

### Text book :

1. Data mining techniques, A K Pujari, University press.

### Reference :

1. J. Han, M. Kamber, “Data Mining Concepts and Techniques”, Harcourt India Pvt Ltd.
2. M. Dunham, “ Data Mining : introductory and Advanced Topics”, Pearson Pub.

# **6B16CSC – E04**

## **Compiler Design**

**Contact Hours /Week : 4 Credit : 3**

### **Module I**

Introduction Compilers, structure, lexical analysis, intermediate code generation, optimization, compiler writing tools, high level programming languages, definition, lexical and syntactic structure of a language.

### **Module II**

Role of lexical analyzer, design of lexical analyzer, regular expressions, finite automata, implementation of a lexical analyzer.

### **Module III**

Syntactic specification of programming languages, Context free grammars, derivations and parse trees, shift reduce parsing, operator precedence parsing, top down parsing. Predictive parsing.

### **Module IV**

Automatic Construction LR Parsers, canonical collection of LR items, constructing SLR parsing tables, constructing canonical SLR parsing tables.

### **Module V**

Symbol tables, contents of a symbol tables, data structure for symbol tables, representing scope information. Errors, lexical errors, syntactic errors, semantic errors.

### **Text Book**

Alfred V Aho & Jeffrey D Ullman, “ Principles of Compiler Design”, Pearson Education

### **Reference**

1. A.A.Puntambekar, “Principles of Compiler Design”, Technical Publications.
2. Compilers Principles and practice Parag H Dave and Himanshu B Dave Pearson Education

# **6B16CSC – E05**

## **Data Compression**

**Contact Hours /Week : 4 Credit : 3**

### **Module I**

Data Compression Lexicon : Introduction to data compression – Dawn age – coding – Modeling – Ziv and Lempel lossy compression. Minimum redundancy coding (the Dawn age) : The shanon – fano algorithm.

### **Module II**

The Huffman algorithm:– Adaptive Huffman code : Adaptive coding, - Arithmetic Huffman coding : Arithmetic coding.

### **Module III**

Statistical modeling: Higher order modeling – Finite context modeling –adaptive modeling . Dictionary – based compression: static vs adaptive – ARC. Sliding window compression: The algorithm – LZSS Compression .

### **Module IV**

LZ78Compression – Decompression. Speech compression : Digital audio Concepts – Lossless compression of sound. Silence Compression

### **Module V**

Image Compression, Lossy Graphics Compression, Video compression – JPEG compression , DCT Compression,

### **Text book**

1. Mark Nelson; “The data Compression Book”, BPB 2003

### **Reference:**

1. Khalid Sayood, “Introduction to Data compression”, Morgan Kaufman, 2003
2. David Salomon, “Data Compression The Complete Reference” Springer 4<sup>th</sup> Ed 2007.
3. Thomas F Quatieri. “Discrete-Time Speech Signal Processing” Pearson 2012
4. David S. Tanbman and Michael W Marcellin, “JPEG – 2000 Image Compression fundamentals, Standard Practice”, Kluwer Academic, 2002.



# 6B16CSC – E06

## Information Security

Contact Hours /Week : Theory:4 Credit: 3

### Module I

Introduction to Information Security- The need for Security, Principles of security - confidentiality, Authentications, Integrity, Non-repudiation. Types of attacks- Passive attacks, Active attacks, Virus, Worm, Trojan horse. Introduction to Cryptography, Steganography.

### Module II

Symmetric Key Encipherment:- Traditional symmetric Key Ciphers: Introduction- Kirchhoff's principle, cryptanalysis, categories of traditional ciphers; Substitution Ciphers - monoalphabetic ciphers, polyalphabetic ciphers; Transposition Ciphers - keyless and keyed transposition ciphers, Stream and Block Ciphers - stream ciphers, block ciphers.

### Module III

DES:Data Encryption Standard:- Introduction, DES Structure - initial and final permutations, rounds, Key Generation examples; DES Analysis - properties-DES weaknesses; Multiple DES - double DES, triple DES; Security of DES - brute-force attack, differential cryptanalysis, linear cryptanalysis.

### Module IV

Public key Cryptosystem: Principles of Public Key Cryptosystems- Public Key Cryptosystem, Applications of Key Cryptosystems, Requirement for Public Key Cryptosystem, Public Key Cryptanalysis. RSA Algorithm – Description of the Algorithm, The security of RSA.

### Module V

Digital Signature:- Comparison- inclusion, verification method, relationship, duplicity; Process- needs for keys, signing the digest; Service- message authentication, message integrity, nonrepudiation, confidentiality; Attacks on Digital Signature- attack types; Digital Signature Schemes- RSA digital signature schemes.

**Text Books:**

1. "Cryptography and Network Security", Behrouz A Forouzan, Tata McGraw-Hill Publishing Company Limited, Special Indian Edition 2007. (For Module - I, II, III, V).
2. "Cryptography and Network Security Principles and Practices", William Stallings, Pearson Education (For Module - IV).

**Reference Text**

1. "Fundamentals of computer security", Josef Pieprzyk, Thomas hardjino and Jennifer Seberry, Springer International Edition 2008.

# 5D01CSC

## Programming with C

Contact Hours/Week: Theory 2 Credit: 2

### Module I

The C character set, Identifiers and keywords, Classes of Data Types, constants, variable declarations. Expressions, statements, operators and expressions: arithmetic operators, unary operators, relational operator, logical operators, assignment operator, the conditional operator. Library functions: data input and output functions like getchar(), putchar(), scanf(), printf(), gets and puts.

### Module II

Control statements: Branching: The if-else statements. Looping: The while, do-while and for loops. The switch statements, Break and continue, comma operator.

### Module III

Functions, Defining a function, accessing a function, function prototype, passing arguments to a function, Returning from a function, recursion, program structure. Storage classes: automatic, static, register and extern(global).

### Module IV

Arrays, Structure and Union : Defining an array, processing an array, passing arrays to functions, multidimensional arrays. Structure and union. Defining a structure, processing a structure. union.

### Module V

Strings: Basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat & strrev.

### Text Book :

1. ANSI C, E. Balagurusamy, 3rd edition McGraw-Hill Publication

### Reference

1. Computer Basics and c Programming, V. Rajaraman, PHI, 2008
2. Programming with ANSI and Turbo C, Ashok N. Kamthane, 1edn, Pearson Education.
3. Let us C, Yeshvanth Kanethkar, 3rd Edn, BPB,
4. Programming with C in Linux, NIIT, PHI.
5. C by Example, Noel Kalicharan, Cambridge University press.

**Model Question Paper**  
**5D01CSC Programming with C**

**Time: 2 Hrs**

**Max. Marks: 20**

**SECTION A**

- 1. Answer in one word (8 x 0.5 = 4 marks)**
- a. A for loop with no test conditions is known as ----- loop.
  - b. The function ..... is used to determine the length of a string.
  - c. For using character functions, we must include ----- header file in the program.
  - d. A function that call itself is known as a ..... function.
  - e. Break statement is used to break from a -----
  - f. Which keyword is used to declare a global variable?
  - g. Union data type allocates same memory location for all the members (True/False)
  - h. String is a -----

**SECTION B**

**Write short notes on ANY THREE of the following questions (3 x 2 = 6 marks)**

2. Differentiate between structure and union.
3. What are C Tokens.
4. How will you read and write a character in C.
5. List and explain logical operators in c.
6. Write if statements required to find the minimum of three integers i, j and k.

**SECTION C**

**Answer ANY TWO of the following questions (2 x 3 = 6 marks)**

7. With suitable examples, explain break and continue statements.
8. With suitable example(s), explain parameter passing techniques in c functions.
9. What is an array? Write a program to read values to an array and display the largest among them.
10. Distinguish between while and do while loops with examples.

**SECTION D**

**Write an essay on ANY ONE of the following questions (1 x 4 = 4 marks)**

11. With suitable examples explain the following:
  1. Switch statement.
  2. Recursive function.
  3. Conditional compilation.
  4. Structure Data type
12. Explain the different data types in C.

# 5D02CSC

## Web Technology

Contact Hours/Week: Theory 2 Credit: 2

### Module I

Introduction to Internet and WWW, Introduction to HTML, structure of HTML, HTML elements, attributes, syntax of tags , starting and ending tags, physical style tags, listing, labeling, grouping, images and linking

### Module II

HTML Tables-tags-<tr>,<td>,<th> attributes. HTML Form-tag, attributes-type-passwd,submit,radio,check,method,action.

### Module III

Frames-<frame>, <frameset>, <iframe>,<noframe> and other important tags and attributes. Simple programs using frames.

### Module IV

Javascript- Introduction, data types, variables, operators, functions, objects, arrays. Client-side object hierarchy and document object Model, <script>, event handlers, javascript in urls. Windows and frames-dialog boxes, status line, navigator object, opening Windows, closing windows, Location object, history object.- Date object- math object- Accessing form object.

### Module V

Introduction to PHP, advantages of PHP, PHP basics- operators and Flow Control, strings and arrays, creating functions.

### Text Books:

1. HTML-Definitive Guide O'reilley 5<sup>th</sup> edn
2. Javascript-Definitive Guide O'reilley 6<sup>th</sup> edn

### Reference:

1. Programming in PHP O'reilley
2. Complete reference in PHP-Steven Hozner
3. Beginning PHP5 (Wrox Programmer)

**Model Question Paper**  
**5D02CSC Web Technology**

**Time: 2 Hrs**

**Max. Marks: 20**

**SECTION A**

**1. Answer in one word**

**(8 x 0.5 = 4 marks)**

- a. WWW stands for .....
- b. Which tag is used for labeling?
- c. Action is an attribute of .....tag.
- d. The tag used to make hyper link is .....
- e. Which tag is used to embed javascript codes within HTML page?
- f. The dialog box used for getting some input from the user is created using .....
- g. HTML stands for.....
- h. The statement used to print in PHP is .....

**SECTION B**

**Write short notes on ANY THREE of the following questions (3x 2 = 6 marks)**

2. Write a note on Javascript.
3. What is meant by events and event handlers?
4. What is the use of <noframe> tag?
5. How can you create arrays in PHP ?
6. Explain the Location object.

**SECTION C**

**Answer ANY TWO of the following questions**

**(2x 3 = 6 marks)**

7. Explain the creation of frames in HTML.
8. Write short note on the Date object.
9. List the advantages of PHP.
10. Explain the different physical style tags.

**SECTION D**

**Write an essay on ANY ONE of the following questions**

**(1 x 4 = 4 marks)**

11. Explain the creation of different types of lists in HTML with examples.
12. Different types of operators in Java Script.

# 5D03CSC

## Database Management System

Contact Hours/Week: Theory 2 Credit: 2

### Module I

Introduction–Field,Record,Entity,Attribute,Relation,Domain,Tuple-Advantages of database systems- data models (Network model, Hierarchical Model, DBTG CODASYL model, Relational Model(E-R)) - system structure.

### Module II

Database administrator- data base users, Constraints(Primary, Foreign, Candidate, Unique)Relational Algebra (Union, Intersection, Difference, Product, Project, Selection).

### Module III

Normalization (First, Second, Third, Fourth, BCNF),SQL: Introduction To SQL-ables DDL, DML, DCL (In Detail),Data Types.

### Module IV

SQL Functions(Different Types of Functions),Operators(Arithmetic, Relational, Logical), Sub Quires (in Detail),Clauses(Having, Group By)

### Module V

Joins(Different Types of Join Statements),View, Introduction to Sequence, Index and Triggers .

### Textbook:

1. Data Base Concept 3rd edition Abraham Silberschatz, Henery f Korth McGraw Hill
2. A Guide to the SQL Standard, C. J. Date and Hugh Darwen, 1997, Addison-Wesley

### Reference:

1. An Introduction to Database Systems, C. J. Date, 1994, Addison-Wesley
2. Understanding the New SQL, Jim Melton and Alan R. Simon, 1993, Morgan Kaufmann.
3. Principles of Database & Knowledge Jeffrey D. Ullman, Computer Science Press, 1988

**Model Question Paper**  
**5D03CSC Database Management System**

**Time: 2 Hrs**

**Max. Marks: 20**

**SECTION A**

- 1. Answer in one word** **(8 x 0.5 = 4 marks)**
- a. The collection of information stored in the database is called.....
  - b. The data hold across the primary key column must be\_\_\_\_\_
  - c. ----- is the total no. of entity sets participating in a relationship
  - d. \_\_\_\_\_ Keys represent relationships between tables.
  - e. The structure of database is.....
  - f. ....is the association among several entities.
  - g. For each attribute there is a set of permitted values is called \_\_\_\_\_
  - h. An entity set without having a primary key is called -----

**SECTION B**

**Write short notes on ANY THREE of the following questions** **(3x 2 = 6 marks)**

2. Explain about INSERT command?
3. What is the usage of CREATE command?
4. Which are the different types of attributes?
5. Explain UPDATE command.
6. Define foreign key.

**SECTION C**

**Answer ANY TWO of the following questions** **(2x 3 = 6 marks)**

7. Explain the advantages of DBMS?
8. Which are the different types of keys?
9. Explain components of SQL?
10. Write a note on ALTER command?

**SECTION D**

**Write an essay on ANY ONE of the following questions** **(1 x 4 = 4 marks)**

11. Explain ER data Model.
12. Write a detailed note on normalization



# COMPLEMENTARY COURSE

# 1C01CSC

## Fundamentals of Computers & Programming Languages

Contact Hours per Week : 2 Theory Credit : 2

### Module I

Introduction to Computers: Characteristics, Generation, Classification, CPU- ALU, Registers, Control Unit, System Bus, Main Memory Unit, Cache Memory. Types of RAM & ROM. Secondary storage devices: magnetic, optical and magneto-optical storage devices. Mass storage devices.

### Module II

Representation of information: number system, binary, octal, hexadecimal system, conversion between number systems, different code used BCD, ASCII, EBCDIC, GRAY Code

### Module III

System software: Assembler- compiler- interpreter- loader- linker - Operating Systems: Functions of OS- importance- Batch processing system- Multi programming- Time sharing system- Real time OS.

### Module IV

Introduction to Computer networking- Goals- topologies-bus- star- ring- mesh- graph-tree- transmission modes- transmission media - classification of networks- LAN, WAN, MAN

### Module V

Computer Programming: Introduction, Developing a program, program development cycle, Algorithm, Flowchart, program control structures, programming paradigms. Assembler, Compiler and Interpreter. Characteristics of a good program, Program structure, top-down design, source code, object code, executable file, file extensions.

**Text Book :**

1. V. Rajaraman, Introduction to Information Technology, Prentice Hal
2. Stuart E Madnick and John J Donovan, "Operating Systems", Tata McGraw-Hill, 2005
3. A S Tanenbaum . Computer Networks 3<sup>rd</sup> Edn Pearson Pub

**Reference books:**

1. Computer Networks – Fundamentals and Applications, Rajesh, Easarakumar & Balasubramaian, Vikas pub
2. B Forousan, Introduction to data communication and networking
3. Pradeep.K. Sinha &Priti Sinha, Computer Fundamentals, BPB Pub
4. Peter Norton, Introduction to Computers,6e,(Indian Adapted Edition)
5. Alexis & Mathews Leon, Fundamentals of Information Technology, Leon Vikas

## Model Question Paper 1C01CSC Fundamentals of Computers & Programming Languages

**Time: 3 Hrs**

**Max. Marks: 32**

### SECTION A

1. **One word answer** **(6 x 0.5 = 3 marks)**
  - a. The fastest memory in a computer system is-----
  - b. -----enables the processor to access data quickly whenever they are needed.
  - c. EBCDIC stands for-----
  - d. In a batch processing system a sequence of jobs is called....
  - e. In a ....network configuration, nodes share a single communication channel
  - f. .... is a transmission media consist of two insulated copper wire arranged in a rectangular spiral pattern

### SECTION B

**Write short notes on ANY FIVE of the following questions (5 x 2 = 10 marks)**

2. Define an algorithm.
3. What is system software?
4. What is the difference between compiler and interpreter?
5. What is meant by mode of transmission?
6. List various types of operating systems
7. Explain any two network topologies
8. What are the different types of computers?
9. What is meant by a digit in number systems? Give examples.

### **SECTION C**

**Answer ANY THREE of the following questions (3 x 3 = 09 marks)**

10. Explain the features of a good programming language
11. Discuss three basic program control structures with suitable examples.
12. What is cache memory?
13. Explain LAN, WAN, MAN
14. What is time sharing system?

### **SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

15. What is an operating system? Explain the role of an OS
16. Explain various network topologies in details
17. Explain about main and secondary memory.
18. Explain various numbers systems in details.

# 2C02CSC

## Programming in C

Contact Hours per Week : 2 Theory Credit : 2

### Module I

Importance of C; Basic structure of C, Executing a C program- Character set - C tokens, Keywords, Identifiers, Constants, Data types, Declaration of variables, Operators. Precedence and order of evaluation.

### Module II

Managing Input output operation: reading a character, writing a character, formatted input output. Branching statements-if, if..else, nested if...else, else...if ladder, switch statement, go to statement. Looping statements- while, do...while, for loop. Break and continue statements.

### Module III

Arrays: Introduction to Arrays - One Dimensional Array - Strings Two Dimensional Array - Multi- dimensional Array. Strings: Basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat & strrev. Two dimensional arrays of strings

### Module IV

Functions: Introduction to Functions, Function Declaration and Prototypes- call by value and call by reference- , Storage Classes - Recursion. Pointers: Introduction to Pointers, Pointer Notation, Pointer Declaration and Initialization, Accessing Variable through Pointer

### Module V

Structures and Unions: Structure Definition, Structure Initialization, Arrays of Structures, Arrays within Structures, Structures within Structures, Union-Definition and Declaration, Accessing a Union Member, Initialization of a Union Variable.

### Text Book :

1. ANSI C, E. Balagurusamy, 3rd edition McGraw-Hill Publication
2. Computer Basics and C Programming, V. Rajaraman, PHI, 2008

3. Programming with ANSI and Turbo C, Ashok N. Kamthane, 1st edn, Pearson Education
4. Let us C, Yashavant Kanetkar, BPB Publications

**Reference books:**

1. Computer Fundamentals and Programming in C, AnitaGoel, Ajay Mittal, Pearson Education
2. Deitel, H M and Deitel P J: "C How to Program", 2nd Edition. Prentice-Hall
3. Gottfried, Byron S: "Programming with C", 1996. Tata McGraw-Hill

## Model Question Paper 2C02CSC Programming in C

**Time: 3 Hrs**

**Max. Marks: 32**

### SECTION A

1. **One word answer** **(6 x 0.5 = 3 marks)**
- a. For a character function, we must include the header file ..... in the program
  - b. Maximum number of elements in the array declaration `int a[5][8]` is.....
  - c. A function that calls itself is called .....
  - d. A pointer hold .....
  - e. A function `malloc()` is used for.....
  - f. The mode ....is used for opening a file for updating

### SECTION B

**Write short notes on ANY FIVE of the following questions** **(5x 2 = 10 marks)**

2. What is recursive function?
3. Explain any three string functions
4. Explain variable access through pointer.

5. What is the syntax of a structure?
6. Write syntax of for loop.
7. What is function proto type?
8. Define an Array.
9. Give suitable examples for array of structures and array within structure.

### **SECTION C**

**Answer ANY THREE of the following questions (3 x 3 = 9 marks)**

10. What are the differences between structure and union
11. What is a string? Write a simple c program using string function.
12. What is the difference between entry controlled and exit controlled loops?
13. Explain call by value and call by reference.
14. What is meant by storage class? Explain.

### **SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

15. Explain the working of a switch statement with example.
16. What are the advantages of using functions? What are the different methods to pass arguments to functions?
17. Write a program to read two matrices and find its product.
18. Write a simple c program for structure and union.

# 3C03CSC

## Database Management System

Contact Hours per Week: 3 Theory Credit: 2

### Module I

Introduction – Advantages of Database systems. View of Data, data Models, database system architecture, Field, Record, Entity, Attribute, Relation, Domain,

### Module II

Data Base Users and administrators, Constraints, Keys (Candidate, Primary, Super, Foreign), Relational Algebra – Fundamental operations, E-R Model, E-R diagrams.

### Module III

Normalization (First, Second, Third, BCNF), SQL: Introduction to SQL Tables – DDL, DML, DCL, Data types.

### Module IV

Visual Basic: What is Visual Basic, Structure of a VB Application, Steps in developing Application, drawing the user interface and setting properties, setting properties of objects at design time and at runtime variables.

### Module V

VB data types , variable declaration, VB operators and functions, Branching statements – if then , go to, select-case, Looping statements, Do-While-Loop, Do-Loop-While, Do-Until-Loop, Do-Loop-Until, While-wend, for-next, Arrays and control arrays.

### Text book .

- 1.Data Base Concept 3rd edition Abraham Silberschatz, Henry f Korth McGraw Hill
2. A Guide to the SQL Standard, C. J. Date and Hugh Darwen, 1997, Addison-Wesley
3. Visual Basic 6, G Cornell, Tata McGraw Hill



**Reference:**

1. An Introduction to Database Systems, C. J. Date, 1994, Addison-Wesley
2. Understanding the New SQL, Jim Melton and Alan R. Simon, 1993, Morgan Kaufmann.
3. Principles of Database & Knowledge Jeffrey D. Ullman, Computer Science Press, 1988.
4. Visual Basic 6 Programming Black Book, Steven Holzner, Dreamtech Press

## Model Question Paper

### 3C03CSC – Database Management System

**Time: 3 Hrs****Max. Marks: 32****SECTION A****1. One word answer****(6 x 0.5 = 3 marks)**

- a. .... Command is used to remove a table from database
- b. ....clause is used to impose sorting on the query results
- c. A relational database consists of a collection of.....
- d. Multiline is the property of ..... control
- e. Write the syntax of the msgbox
- f. OLE stands for.....

**SECTION B****Write short notes on ANY FIVE of the following questions****(5 x 2 = 10 marks)**

2. What is primary key?
3. Explain about insert command
4. Explain update command
5. Explain field , record and entity
6. Define use of DML
7. Define 2NF
8. What is the need of go to statement in VB?
9. Define a variable in VB

**SECTION C**

Answer **ANY THREE** of the following questions

**(3x 3 = 9 marks)**

10. Explain the advantage of DBMS
11. Explain the components of SQL
12. Write a notes on three SQL commands with example
13. What is control array? Explain
14. Explain various do loop in VB

**SECTION D**

Write an essay on **ANY TWO** of the following questions

**(2 x 5 = 10 marks)**

15. What do you mean by database administrator? Explain function of DBA
16. Explain E –R model in details
17. Explain various looping statements in VB with examples
18. What is meant by Normalization? Explain different types of normalization with suitable examples.

# 4C04CSC

## Visual Programming

**Contact Hours / Week : 3 Theory Credit : 2**

### Module I

SQL functions (Different types of functions), Operators (Arithmetic, Relational, Logical), Sub queries(in detail), Order by clause.

### Module II

Joins (Different types of join), View, Introduction to sequence, Index and Triggers.

### Module III

VB Controls: Button, Label, ,Text Box, List Box, Combo Box, Picture Box, Image Box, Check Box, Option Button, Timer, Frame, Scroll Bar, Line and Shape. Designing an application, Using general sub procedures in applications, Code module, Menu-Editor (Note editor).

### Module IV

Error Types, Debugging VB programs, Debugging strategies, Sequential files, writing and adding text using sequential files. Random access files, writing and reading text using random access files, graphics methods, timer tools, animation techniques.

### Module V

Database structure and terminology- ADO data control, Assigning tables, Bound data tools, Connection to the Database –Simple database programs. Multiple form visual basic applications, VB multiple document interface (MDI)

### Text Book

1. Understanding the New SQL, Jim Melton and Alan R. Simon, 1993, Morgan
2. Visual Basic 6, G Cornell, Tata McGraw Hill

### Reference

1. Data Base Concept 3rd edition Abraham Silberschatz, Henery f Korth McGraw Hill
2. A Guide to the SQL Standard, C. J. Date and Hugh Darwen, 1997, Addison-Wesley
3. Visual Basic 6 Programming Black Book, Steven Holzner, Dreamtech Press,

**Model Question Paper**  
**4C04CSC Visual Programming**

**Time: 3 Hrs**

**Max. Marks: 32**

**SECTION A**

**1. One word answer (6 x 0.5 = 3 marks)**

- a. The result of query can be arranged in ascending or descending order using .....clause.
- b. The part of the query following WHERE is usually called .....
- c. Average of a column can be calculated using .....SQL function
- d. A .....is a virtual table.
- e. ADO stands for .....
- f. Which VB control can be used to insert an image to the form?

**SECTION B**

**Write short notes on ANY FIVE of the following questions (5 x 2 = 10 marks)**

2. What are the different types of errors in VB?
3. What is a random access file in VB?
4. What is use of timer control in VB
5. What is the significance of using order by in a query?
6. List various arithmetic operators used in SQL.
7. What is meant by triggers?
8. What is meant by MDI?
9. What are the basic controls used in VB?

**SECTION C**

Answer **ANY THREEE** of the following questions (3 x 3 = 9 marks)

10. What is meant by sequence? Give an example.
11. What are the differences between combo box and list box?
12. Write a note on menu editor.
13. Explain ADO control.
14. Explain subquery.

**SECTION D**

Write an essay on **ANY TWO** of the following questions (2 x 5 = 10 marks)

15. What are the different types of joins? Explain with examples
16. Explain various SQL functions with suitable examples.
17. Explain the connection between ADO and Database using simple program
18. Write the code to develop an application using basic controls of VB

## 4C05CSC

### Lab I (C Programming, DBMS & Visual Basic)

#### Guidelines

- a. Students have to record a minimum of 25 programs.
- b. Students have to practice all the programs given in the list
- c. Lab consists of two sections, Section A programming with C and Section B DBMS and Visual Basic. Equal mark will be given for both sections.
- d. For internal assessment each section may be evaluated independently and final CA grade shall be obtained by combining them.
- e. End semester (4<sup>th</sup> Sem) examination question shall carry questions from both sections. Students have to write and execute both programs.

#### Sample Programs List

##### Procedure Oriented Programming Using C

1. Develop a program to find the number of and sum of all integers greater than 100 and less than 200 that are divisible by 7.
2. Program to read a floating point number and display the right most digit of its integral part.
3. Admission to a professional course is subject to the following conditions:
  - a) Marks in mathematics  $\geq 60$ .
  - b) Marks in Physics  $\geq 50$ .
  - c) Marks in Chemistry  $\geq 40$ .
  - d) Total in all three subjects  $\geq 200$  Or
  - e) Total in Mathematics and Physics  $\geq 150$ .

Given the marks in the three subjects, develop a program to print whether an applicant is eligible or not.

4. Develop a program using do-while loop to print the first n fibonacci numbers.
5. Develop a program to sort a list of n positive integers in ascending/descending order.

6. Implement a simple calculator using switch statement
7. Program to find the factorial of a number using recursion.
8. Program to find whether the string is palindrome or not.
9. Program to check whether the given number is prime or not.
10. Program to add and subtract two matrices
11. Program to find biggest, smallest, sum and difference of two numbers using functions.
12. Create a structure time comprises hr, min and sec. Use get(), add() and display() functions. Write a main function to add two time variables and display the resultant time.
13. Program to find the binary equivalent of a positive integer
14. Program to search a list of integers for a key k.
15. Program to sort a list of n names in alphabetical order

### **DBMS. [Sample exercises are given below]**

#### **SQL -1**

Create table students with fields sno, sname, sex, mark with sno as primary key and assign suitable constraints for each attribute. Insert five records into the table.

- a) Alter the table by adding one more field rank.
- b) Display all boy students with their name.
- c) Find the Average mark
- d) Create a query to display the sno and sname for all students who got More than the average mark. Sorts the results in descending order of mark.
- e) Create a sequence named 'star' to be used with student tables primary key
- f) column-sno. The sequence should start with 10 & max value 99
- g) Display girl student name for those who have marks greater than 40 and less than 20.

**SQL -2** Create a table department with fields ename, salary, dno, dname, place with dno as primary key. Insert five records into the table.

- a) Rename the field 'place' with 'city'
- b) Display the employees who got salary more than Rs.6000 and less than 10000 /-
- c) Display total salary of the organization
- d) Display ename for those who are getting salary in between 5000 and 10000.
- e) Create a view named 'Star' with field ename, salary & place

- f) display ename and salary, salary rounded with 10 digits\*\*'

**SQL -3** Create table loan with fields loanno, cname, cid, bname assigning suitable constraints. Insert 5 Records in to the table.

- a. Calculate Rs 150 extra for all customers having loan. The added loan amount will display in a new coloumn.
- b. Add one more field amount to loan table. Display cname for cid=2.
- c. Create table depositor with fields cid and accno.
- d. Insert five records into the table.
- e. Display loanno and cname of a customer who is residing in Kannur city.
- f. Display all information from loan table for loanno 2,8,10.

### **Visual Basic [Sample Program List]**

1. Create a Calculator.
2. Write a program for traffic signal with the help of Timer.
3. Write a program to find out factorial, Fibonacci and prime numbers using list box.
4. Write a program to perform sequential File operation.
5. Write a program to perform Random File Operation.
6. Create a menu driven program for Graphic operation (Drawing different colour schemes, file style, border, free hand Drawing-Keyboard and Mouse).
7. Perform bank operations using Data access objects.
8. Create a student database using data controls
9. Create a telephone directory.

**Sd/-**

*Shijo M Joseph*  
*Chairman BOS Computer Science (UG)*



  
**KANNUR UNIVERSITY**

(Abstract)

Bachelor of Business Administration(Travel & Tourism Management) (BBA/BBA-TTM) Programme -  
Scheme, Syllabi and Model Question Papers - Core/Complementary/Open Courses under Choice Based  
Credit Semester System-Implemented with effect from 2014 Admission - Orders issued.

ACADEMIC BRANCH

U.O No. Acad/C1/2881/2014

Dated, Civil Station (PO), 3-05-2014

- Read: 1. U.O.No.Acad/C2/2232/2014 dated 14/03/2014  
2. Minutes of the meeting of the Board of Studies in Management Studies (Cd) held on  
24-03-2014  
3. Minutes of the meeting of the Faculties of Commerce and Management Studies held  
on 28-03-2014  
4. Letter dated 7-04-2014 from the Chairman, Board of Studies in Management Studies  
(Cd)

ORDER

1. The Revised Regulations for Choice based Credit Semester System have been implemented in this University with effect from 2014 admission vide paper read (1) above.

2. As per the paper read (2) above, Board of Studies in Management Studies (Cd) finalized the Scheme, Syllabi and Model Question Papers of BBA/BBA-TTM Programmes under Choice Based Credit Semester System with effect from 2014 admission.

3. As per the paper read (3) above the meeting of Faculty of Commerce and Management Studies approved the Scheme, Syllabi and model question papers for BBA/BBA(TTM) w.e.f.2014 admission.

4. As per the paper read (4) above, the Chairman, Board of Studies in Management Studies (Cd) vide paper read (4) above, has forwarded the Scheme, Syllabi and Model Question Papers for BBA/BBA (TTM) Programmes for implementation with effect from 2014 admission.

5. The Vice Chancellor after considering the matter in detail and in exercise of the powers of Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement Scheme, Syllabus and Model Question Papers (Core/Complementary/Open Courses) for BBA/BBA(TTM) under Choice Based Credit Semester System with effect from 2014 admission subject to report Academic Council.

6. Orders are, therefore, issued accordingly.

7. The Implemented Scheme, Syllabi and Model Question Papers are appended.

Sd/-  
DEPUTY REGISTRAR (Academic)  
For REGISTRAR

To


The Principals of Colleges offering BBA/BBA(TTM) Courses.

(PTO)

286-  
5/5/14

1. The Examination Branch (through PA to CE)
2. PS to VC/PA to /PA to Registrar /
3. Chairman BOS Management Studies (Cd)
4. PA to CE
5. DR/AR I Academic
6. SF/DF/FC.

Forwarded/ by Order

  
Section Officer

**For more details; log on [www.kannur university.ac.in](http://www.kannur university.ac.in)**



# **KANNUR UNIVERSITY**

**(U.O.No.Acad/C1/2881/2014,dt.3-05-2014)**

## **SCHEME AND SYLLABI OF BACHELOR OF BUSINESS ADMINISTRATION (BBA)**

**UNDER CBCSS PATTERN**

**(KUCBCSSUG 2014)**

# KANNUR UNIVERSITY

## SCHEME AND SYLLABI OF BACHELOR OF BUSINESS ADMINISTRATION UNDER KUCBCSSUG 2014

**The Regulation of UG Programme (KUCBCSS UG 2014) is available in the university website. Following are the additional information with regard to BBA Programme under Choice Based Credit Semester System to be implemented in the academic session 2014-15.**

1. **Title of the programme:** This DEGREE shall be called BACHELOR OF BUSINESS ADMINISTRATION .
2. **Eligibility for admission:** Admission shall be made from the Candidates who have passed the Plus Two or equivalent examination with 45% for non commerce subject (not applicable to SC/ST Students) and pass mark for Commerce subject. A weightage of 25 marks be given for each Commerce subject studied by the Candidate in the qualifying examination subject to a maximum of 75 marks.
3. **Duration of the programme:** The duration of the BBA programme of study is three academic years with six semesters.
4. **Medium of Instruction:** The medium of instruction and examination shall be English.

| 6.0          |                              | The total credits                              | Number     | Credits    |
|--------------|------------------------------|------------------------------------------------|------------|------------|
| 1            | <b>Common Courses</b>        | English                                        | 4 courses  | 14         |
|              |                              | Additional Language                            | 2 courses  | 8          |
|              |                              | General                                        | 4 courses  | 16         |
| 2            | <b>Complementary Courses</b> |                                                | 5 courses  | 15         |
| 3            | <b>Open Courses</b>          |                                                | 1 course   | 2          |
| 4            | <b>Core Courses</b>          | <b>Courses</b>                                 | 19 courses | 62         |
|              |                              | <b>Industrial visit and report</b>             | 1 course   | 1          |
|              |                              | <b>Placement Training &amp; Project report</b> | 1 course   | 2          |
| <b>Total</b> |                              |                                                | <b>37</b>  | <b>120</b> |

**Table of Common Courses (English and Additional Language) for BBA**

| Sl. No | Course Code | Type of course | Course Title           | Semester | Hours/Week | Credits | Marks |
|--------|-------------|----------------|------------------------|----------|------------|---------|-------|
| 1      | 1A01ENG     | Common I       | English I              | I        | 5          | 4       |       |
| 2      | 1A02 ENG    | Common II      | English II             | I        | 4          | 3       |       |
| 3      | 1A07---     | Common III     | Additional Language I  | I        | 5          | 4       |       |
| 4      | 2A03ENG     | Common IV      | English III            | II       | 5          | 4       |       |
| 5      | 2A04ENG     | Common V       | English IV             | II       | 4          | 3       |       |
| 6      | 2A08---     | Common VI      | Additional Language II | II       | 5          | 4       |       |

**Table of Common Courses (General Courses) for BBA Programmes**

| Sl. No | Course Code  | Type of course | Course Title                                      | Semester | Hours/Week | Credits | Marks                                |
|--------|--------------|----------------|---------------------------------------------------|----------|------------|---------|--------------------------------------|
| 1      | 3A11 COM/BBA | Common XI      | IT in Business                                    | III      | 5          | 4       | E - 30<br>P - 10<br>I - 10<br>T - 50 |
| 2      | 3A12 COM/BBA | Common XII     | Numerical Skills                                  | III      | 4          | 4       | E - 40<br>I - 10<br>T - 50           |
| 3      | 4A13COM/BBA  | Common XIII    | Entrepreneurship Development & Project Management | IV       | 5          | 4       | E - 40<br>I - 10<br>T - 50           |
| 4      | 4A14 COM/BBA | Common XIV     | Business Ethics & Corporate Social Responsibility | IV       | 4          | 4       | E - 40<br>I - 10<br>T - 50           |

**E: External P: Practical I : Internal T : Total**

**Table of Complementary Courses for BBA Programmes**

| Sl. No | Course Code | Type of course    | Course Title                                   | Semester | Hours/Week | Credits | Marks                      |
|--------|-------------|-------------------|------------------------------------------------|----------|------------|---------|----------------------------|
| 1      | 1C01 BBA    | Complementary I   | Business Statistics                            | I        | 5          | 3       | E - 40<br>I - 10<br>T - 50 |
| 2      | 1C02 BBA    | Complementary II  | Business Economics                             | I        | 3          | 3       | E - 40<br>I - 10<br>T - 50 |
| 3      | 2C03 BBA    | Complementary III | Quantitative Techniques for Business Decisions | II       | 5          | 3       | E - 40<br>I - 10<br>T - 50 |
| 4      | 3C04 BBA    | Complementary IV  | Legal Aspects of Business                      | III      | 5          | 3       | E - 40<br>I - 10<br>T - 50 |
| 5      | 4C05 BBA    | Complementary V   | Business Research Methods                      | IV       | 4          | 3       | E - 40<br>I - 10<br>T - 50 |

**Table of Open Courses for BBA Programmes**

| Sl. No | Course Code | Type of course | Course Title                                                       | Semester | Hours/Week | Credits | Marks                      |
|--------|-------------|----------------|--------------------------------------------------------------------|----------|------------|---------|----------------------------|
| 1      | 5D01 BBA    | Open I         | Basic Accounting/Financial System and Services/Disaster Management | V        | 2          | 2       | E - 40<br>I - 10<br>T - 50 |

**Table of Core Courses for BBA Programmes**

| Sl. No | Course Code | Type of course | Course Title                               | Semester | Hours/Week | Credits | Marks                      |
|--------|-------------|----------------|--------------------------------------------|----------|------------|---------|----------------------------|
| 1      | 1B01 BBA    | Core I         | Principles & Practice of Management        | I        | 3          | 3       | E - 40<br>I - 10<br>T - 50 |
| 2      | 2B02 BBA    | Core II        | Business Environment                       | II       | 3          | 3       | E - 40<br>I - 10<br>T - 50 |
| 3      | 2B03 BBA    | Core III       | Business Communication                     | II       | 3          | 3       | E - 40<br>I - 10<br>T - 50 |
| 4      | 3B04 BBA    | Core IV        | Financial Accounting                       | III      | 5          | 4       | E - 40<br>I - 10<br>T - 50 |
| 5      | 3B05 BBA    | Core V         | Operations Management                      | III      | 4          | 3       | E - 40<br>I - 10<br>T - 50 |
| 6      | 3B06 BBA    | Core VI        | Managerial Skill Development Course (MSDC) | III      | 2          | 1       | I - 25<br>T - 25           |
| 7      | 4B07 BBA    | Core VII       | Marketing Management                       | IV       | 4          | 3       | E - 40<br>I - 10<br>T - 50 |
| 8      | 4B08 BBA    | Core VIII      | Corporate Accounting                       | IV       | 5          | 3       | E - 40<br>I - 10<br>T - 50 |
| 9      | 4B09 BBA    | Core IX        | Financial Management                       | IV       | 4          | 3       | E - 40<br>I - 10<br>T - 50 |
| 10     | 4B10 BBA    | Core X         | Industrial Visit and Report (Study Tour)   | IV       |            | 1       | I - 25<br>T - 25           |
| 11     | 5B11 BBA    | Core XI        | Cost Accounting                            | V        | 5          | 4       | E - 40<br>I - 10<br>T - 50 |
| 12     | 5B12 BBA    | Core XII       | Human Resource Management                  | V        | 5          | 4       | E - 40<br>I - 10<br>T - 50 |
| 13     | 5B13 BBA    | Core XIII      | Banking Theory, Law & Practice             | V        | 4          | 3       | E - 40<br>I - 10<br>T - 50 |

|    |          |            |                                        |    |   |   |                            |
|----|----------|------------|----------------------------------------|----|---|---|----------------------------|
| 14 | 5B14 BBA | Core XIV   | Organisational Behaviour               | V  | 5 | 4 | E - 40<br>I - 10<br>T - 50 |
| 15 | 5B15 BBA | Core XV    | Retail Management                      | V  | 4 | 3 | E - 40<br>I - 10<br>T - 50 |
| 16 | 6B16 BBA | Core XVI   | Strategic Management                   | VI | 5 | 4 | E - 40<br>I - 10<br>T - 50 |
| 17 | 6B17 BBA | Core XVII  | Capital Market & Investment Management | VI | 5 | 4 | E - 40<br>I - 10<br>T - 50 |
| 18 | 6B18 BBA | Core XVIII | International Business                 | VI | 4 | 3 | E - 40<br>I - 10<br>T - 50 |
| 19 | 6B19 BBA | Core XIX   | Event Management                       | VI | 4 | 3 | E - 40<br>I - 10<br>T - 50 |
| 20 | 6B20 BBA | Core XX    | Management Accounting                  | VI | 5 | 4 | E - 40<br>I - 10<br>T - 50 |
| 21 | 6B21 BBA | Core XXI   | Placement Training & Project Report    | VI | 3 | 2 | E - 40<br>I - 10<br>T - 50 |

### **TotalMarksDistribution**

|    |                             |             |
|----|-----------------------------|-------------|
| 1. | <b>English</b>              | 200         |
| 2. | <b>Additional Languages</b> | <b>100</b>  |
| 3. | Common Course               | 200         |
| 4. | <b>Open Course</b>          | <b>50</b>   |
| 5. | <b>Core Course</b>          | <b>1000</b> |
| 6. | <b>Complementary</b>        | <b>250</b>  |
|    | <b>Total</b>                | <b>1800</b> |

## STRUCTURE OF BBA DEGREE PROGRAMME

### Semester I

| Sl. No.      | Course Code | Type of course    | Course Title                                   | Hours/Week | Hours/ Sem | Credits   | Exam Duration |
|--------------|-------------|-------------------|------------------------------------------------|------------|------------|-----------|---------------|
| 1            | 1A01ENG     | Common I          | English I                                      | 5          | 90         | 4         | 3             |
| 2            | 1A02 ENG    | Common II         | English II                                     | 4          | 72         | 3         | 3             |
| 3            | 1A07---     | Common III        | Additional Language I                          | 5          | 90         | 4         | 3             |
| 4            | 1B01 BBA    | Core I            | Principles & Practice of Management            | 3          | 54         | 3         | 3             |
| 5            | 1C01 BBA    | Complementary I   | Business Statistics                            | 5          | 90         | 3         | 3             |
| 5            | 1C02 BBA    | Complementary II  | Business Economics                             | 3          | 54         | 3         | 3             |
| <b>Total</b> |             |                   |                                                | <b>25</b>  | <b>450</b> |           |               |
| Sl. No       | Course Code | Type of course    | Course Title                                   | Hours/Week | Hours/ Sem | Credits   | Exam Duration |
| 1            | 2A03ENG     | Common IV         | English III                                    | 5          | 90         | 4         | 3             |
| 2            | 2A04ENG     | Common V          | English IV                                     | 4          | 72         | 3         | 3             |
| 3            | 2A08---     | Common VI         | Additional Language II                         | 5          | 90         | 4         | 3             |
| 4            | 2B02 BBA    | Core II           | Business Environment                           | 3          | 54         | 3         | 3             |
| 5            | 2B03 BBA    | Core III          | Business Communication                         | 3          | 54         | 3         | 3             |
| 6            | 2C03 BBA    | Complementary III | Quantitative Techniques for Business Decisions | 5          | 90         | 3         | 3             |
| <b>Total</b> |             |                   |                                                | <b>25</b>  | <b>450</b> | <b>20</b> |               |

### Semester III

| Sl. No       | Course Code          | Type of course   | Course Title                               | Hours/Week | Hours / Sem | Credits   | Exam Duration |
|--------------|----------------------|------------------|--------------------------------------------|------------|-------------|-----------|---------------|
| 1            | 3A11/<br>COM/<br>BBA | Common XI        | IT in Business                             | Theory     | 3           | 54        | 3             |
|              |                      |                  |                                            | Practical  | 2           | 36        | 1             |
| 2            | 3A12/<br>COM/        | Common XII       | Numerical Skills                           | 4          | 72          | 4         | 3             |
| 3            | 3B04 BBA             | Core IV          | Financial Accounting                       | 5          | 90          | 4         | 3             |
| 4            | 3B05 BBA             | Core V           | Operations Management                      | 4          | 72          | 3         | 3             |
| 5            | 3B06 BBA             | Core VI          | Managerial skill Development Course (MSDC) | 2          | 36          | 1         |               |
| 6            | 3C04 BBA             | Complementary IV | Legal Aspects of Business                  | 5          | 90          | 3         | 3             |
| <b>Total</b> |                      |                  |                                            | <b>25</b>  | <b>450</b>  | <b>19</b> |               |



**Semester IV**

| Sl. No       | Course Code | Type of course  | Course Title                                      | Hours/Week | Hours/Sem  | Credits   | Exam Duration |
|--------------|-------------|-----------------|---------------------------------------------------|------------|------------|-----------|---------------|
| 1            | 4A13COM/BBA | Common XIII     | Entrepreneurship Development & Project Management | 4          | 72         | 4         | 3             |
| 2            | 4A14COM/BBA | Common XIV      | Business Ethics and CSR                           | 4          | 72         | 4         | 3             |
| 3            | 4B07 BBA    | Core VII        | Marketing Management                              | 4          | 72         | 3         | 3             |
| 4            | 4B08 BBA    | Core VIII       | Corporate Accounting                              | 5          | 90         | 3         | 3             |
| 5            | 4B09 BBA    | Core IX         | Financial Management                              | 4          | 72         | 3         | 3             |
| 6            | 4B10 BBA    | Core X          | Industrial Visit & Report(Study Tour)             |            |            | 1         |               |
| 7            | 4C05 BBA    | Complementary V | Business Research Methods                         | 4          | 72         | 3         | 3             |
| <b>Total</b> |             |                 |                                                   | <b>25</b>  | <b>450</b> | <b>21</b> |               |

**Semester V**

| Sl. No       | Course Code | Type of course | Course Title                  | Hours/Week | Hours/Sem  | Credits   | Exam Duration |
|--------------|-------------|----------------|-------------------------------|------------|------------|-----------|---------------|
| 1            | 5B11 BBA    | Core XI        | Cost Accounting               | 5          | 90         | 4         | 3             |
| 2            | 5B12 BBA    | Core XII       | Human Resource Management     | 5          | 90         | 4         | 3             |
| 3            | 5B13 BBA    | Core XIII      | Banking Theory Law & Practice | 4          | 72         | 3         | 3             |
| 4            | 5B14 BBA    | Core XIV       | Organisational Behaviour      | 5          | 90         | 4         | 3             |
| 5            | 5B15 BBA    | Core XV        | Retail Management             | 4          | 72         | 3         | 3             |
| 6            | 5D01 BBA    | Open I         |                               | 2          | 36         | 2         | 2             |
| <b>Total</b> |             |                |                               | <b>25</b>  | <b>450</b> | <b>20</b> |               |

**Semester VI**

| Sl. No       | Course Code | Type of course | Course Title                           | Hours/Week | Hours / Sem | Credits   | Exam Duration |
|--------------|-------------|----------------|----------------------------------------|------------|-------------|-----------|---------------|
| 1            | 6B16 BBA    | Core XVI       | Strategic Management                   | 4          | 72          | 4         | 3             |
| 2            | 6B17 BBA    | Core XVII      | Capital Market & Investment Management | 5          | 90          | 4         | 3             |
| 3            | 6B18 BBA    | Core XVIII     | International Business                 | 4          | 72          | 3         | 3             |
| 4            | 6B19 BBA    | Core XIX       | Event Management                       | 4          | 72          | 3         | 3             |
| 5            | 6B20 BBA    | Core XX        | Management Accounting                  | 5          | 90          | 4         | 3             |
| 6            | 6B21 BBA    | Core XXI       | Placement Training & Project Report    | 3          | 54          | 2         |               |
| <b>Total</b> |             |                |                                        | <b>25</b>  | <b>450</b>  | <b>20</b> |               |

5. **Open Courses:** BBA Students shall take one open courses (2Credits) offered by other departments in the V semester.
  
6. **Managerial Skill Development Course (MSDC):** The course on Management Development is intended for developing the current/latest business knowledge, understanding of the economic situation of the nation and soft skills/employability skills of the BBA students. This course shall be handled by a teacher having genuine interest and latest knowledge in current business, economic survey and union budget. The course shall be conducted in such a way that the above knowledge areas will be covered using various methodologies such as presentations, group discussions, assignments quiz competitions etc. that will enhance the soft/employability skills. The maximum marks for the course shall be 25. The evaluation of the course will be done internally on the basis of a written examination for 20 marks and presentations, assignment and attendance for 5 marks.
  
7. **Industrial Visit & Project Report:** Every student shall prepare and submit a Report based on industrial visits during the IV Semester under the guidance of a faculty member one month before the end of the semester. Evaluation shall be done internally. The maximum marks for the course shall be 25.
  
8. **Placement Training & Project Report**

During the sixth semester the candidate shall do a research project on a business/management topic.

Maximum four students as group can take up a topic and the students in consultation and with the consent of the assigned guide may identify a topic and do research on that topic. To have more academic freedom and flexibility, the project should not be attached to any organization.

The candidates together shall prepare and submit a project report to the Department. The report shall be printed and spiral bound with not less than 50 A4 size pages. The project report should be submitted to the Head of the Department on the last working day of the sixth semester.

### **Project work shall have the following stages**

- Project proposal presentation
- Field work and data analysis
- Report writing
- Draft project report presentation
- Final project report submission

The candidate shall prepare at least two copies of the report: one copy for submission to the Department and one copy for the student which he/she has to bring with him/her at the time of viva voce. More copies may be prepared if the guide or both asks for one copy.

### **Structure of the report**

#### **Title page**

#### **Certificate from guide countersigned by HOD**

#### **Acknowledgements**

#### **Contents**

#### **Chapter I: Introduction (Organization profile, Research problem, objectives of the study, Research methodology etc.)**

#### **Chapter II: Review of literature**

#### **Chapters III: and IV: Data Analysis ( 2 or 3 chapters)**

#### **Chapter V: Summary, Findings and Recommendations.**

#### **Appendix (Questionnaire, specimen copies of forms, other exhibits etc.)**

#### **Bibliography (books, journal articles etc. used for the project work).**

### **Evaluation of project report**

The project report shall have internal and external evaluations:

Maximum 50 marks shall be awarded by internal panel of teachers. Out of the internal 50 marks 30 marks shall be given on the basis of the draft report presentation and 20 marks be given for the participation and contribution of the student in various stages of project.

Maximum 50 marks shall be awarded by external examiners. Out of the external 50 marks,

25 marks shall be given for the project report evaluation and 25 marks shall be given for the performance in viva voce examination.

9. **Requirement for passing the course:** For passing the BBA degree program the student shall be required to achieve a minimum of 120 credits of which 38 credits shall be from common courses, 65 credits from core courses, 15 credits from complementary courses and 2 credits from open courses.

## SEMESTER 1

### 1BO1BBA : PRINCIPLES AND PRACTICE OF MANAGEMENT

|                      |                                                                                                                                                                                                                  |                           |                               |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------|
| <b>Objective</b>     | 1. To understand the principles and practices of General Management.<br>2. To know the process of business management and its functions and<br>3. To familiarize the students with current management practices. |                           |                               |
| <b>Pedagogy</b>      | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.                                                                                                                                       |                           |                               |
| <b>Core course 1</b> | 3 credits                                                                                                                                                                                                        | 3 teaching hours per week | 3 Hrs. End Sem. Exam Marks 40 |

#### **Module I:**

**Management:** Definition, Nature, Purpose and Scope of Management, Features of Management, Evolution of Management Thought Contributions made by Taylor, Fayol, Elton Mayo, Maslow- scientific Management and its Principles- Levels of Management

#### **Module II:**

**Planning: Meaning** – Nature- Types of Plans –Characteristics of Planning – Steps in Planning- Forecasting and Decision Making- components of Planning - Objectives – Strategies – Policies – procedures

#### **Module III:**

**Organising: Meaning-** Principles of Organizing- Departmentation - Bases of Departmentation- Delegation of Authority- Centralisation and Decentralisation -Line and Staff authority

#### **Module IV:**

**Staffing: Nature and purpose** – Directing – Meaning – Nature – Characteristics - Principles – Importance – Role of communication and leadership in directing –Supervision.

#### **Module V:**

**Co-ordination: Meaning-** Need for co-ordination – Approaches to achieve effective co-ordination – Characteristics of co-ordination and Cooperation – Controlling – Need for control – Control process – Methods of control – Characteristics of effective control.

#### **References :**

1. Essential of Management : Robbins
2. Management : Koontz, H and Wehrick, H.
3. Management: Tasks, Responsibilities and Practices :Drucker, Peter, F
4. Principles of Management : Shyamal Banerjee.

## SEMESTER 1

### 1CO1BBA : BUSINESS STATISTICS

|                        |                                                                                                                                          |                            |                                |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------|
| <b>Objective</b>       | To familiarize the students with the basic Statistical tools used to summaries and analyze quantitative information for decision making. |                            |                                |
| <b>Pedagogy</b>        | Lectures, Assignments, Practical exercises ,Case discussion, Seminars etc.                                                               |                            |                                |
| <b>Complementary I</b> | 3 Credits                                                                                                                                | 5 teaching hours. per week | 3 Hrs. End em. Exam : Marks 40 |

#### **Module I:**

**Business Statistics – meaning & definition-** functions – limitations – scope –Data – types of data – presentation of statistical data – classification and tabulation, frequency distribution, Diagrammatic and graphic representation –one dimensional diagrams – two dimensional diagram - circular diagram-pie diagram-histogram-frequency curves - ogives.

#### **Module II:**

**Measures of Central Tendency** – Arithmetic Mean, Geometric Mean, Harmonic mean – Simple & weighted – Median, Mode - Measures of Dispersion – Range, Quartile Deviation, Mean Deviation, Standard Deviation, Lorenz curve- Measures of skewness and kurtosis.

#### **Module III:**

**Correlation & Regression Analysis:** Correlation – concept – Types – Measures – Karl Pearson’s Method- Spearman Rank Method - Scatter Diagram Method. Regression Analysis – concept – Simple Regression – Regression lines – Regression equations – Relation between Correlation and Regression.- Coefficient of Determination.

#### **Module IV:**

**Time series Analysis** – components – Methods of studying secular trend – Freehand curves - Semi Average Method - Moving Average Method – Method of Least Squares.

#### **References :**

1. Statistical Methods : S.P. Gupta
2. Business Statistics : N D Vohra
3. Statistics : Dr. B.N.Gupta
4. Mathematical Statistics :S C Gupta& V K Kapoor

## SEMESTER 1

### 1CO2BBA : BUSINESS ECONOMICS

|                         |                                                                                                                                                                                            |                            |                               |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------|
| <b>Objective</b>        | 1. To expose students to basic micro economic concepts.<br>2. To apply economic analysis in the formulation of business policies.<br>3. To use economic reasoning to problems of business. |                            |                               |
| <b>Pedagogy</b>         | Lectures, Assignments, Practical exercises, Seminars, etc.                                                                                                                                 |                            |                               |
| <b>Complementary II</b> | 3<br>Credits                                                                                                                                                                               | 3 Teaching hrs per<br>week | 3 Hrs. End Sem. Exam Marks 40 |

#### **Module I:**

**Introduction** :Meaning, Nature and Scope of Business Economics - Micro and Macro - Basic Economic Problems - Market forces in solving economic problems - Circular Flow of Income and Expenditure

#### **Module II:**

**Concept of Demand** - Elasticity of Demand and their types. - Revenue Concepts - Total Revenue, Marginal Revenue, Average Revenue and their relationship - Concept and Law of Supply - Factors Affecting Supply

#### **Module III:**

**Accounting Costs and Economic Costs** - Short Run Cost Analysis: Fixed, Variable and Total Cost Curves, Average and Marginal Costs - Long Run Cost Analysis: Economies and Dis economies of Scale and Long Run Average and Marginal Cost Curves

#### **Module IV:**

**Competition** :Perfect Competition - Equilibrium of Firm and Industry under Perfect Competition Monopoly - Price Determination under Monopoly Monopolistic Competition - Price and Output Determination under Monopolistic Competition

#### **References :**

1. Managerial Economics : Analysis, Problems and Cases, P.L Mehta.
2. Managerial Economics : Varshney and Maheshwari.
3. Managerial Economics : D. Salvatore.
4. Managerial Economics : Pearson and Lewis
5. Managerial Economics : G.S. Gupta

## SEMESTER II

### 2BO2 BBA : BUSINESS ENVIRONMENT

|                   |                                                                                                                                                                   |                          |                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------|
| <b>Objectives</b> | To give the students an exposure to the dynamics of business environment and enable them to analyse business priorities in the changing environmental conditions. |                          |                                 |
| <b>Pedagogy</b>   | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.                                                                                        |                          |                                 |
| <b>Core II</b>    | 3 Credits                                                                                                                                                         | 3 Teaching hrs. Per week | 3 Hrs. End Sem. Exam : Marks 40 |

#### **Module I:**

**Business Environment** – concept – components – importance – Indian Business Environment – Need for environmental analysis – Benefits and Limitations

#### **Module II:**

**Social and cultural environment** – Interface between business and culture – social responsibilities of business – Political Environment – Economic roles of government – legal environment – the constitutional environment – rationale and extent of state intervention

#### **Module III:**

**Economical Environment** – nature of economic environment – New Economic Policy 1991 – Privatization – nature – objectives – disinvestment – limitations – Public sector – Objectives – public sector in India.

#### **Module IV:**

**Ecological Environment** – Ecology and business – Industrial pollution – Global Environment – Globalization – MNCs - Problems with MNCs – Global entry strategies – measures to promote globalization – challenges of globalization to Indian Industry – problems.

#### **References :**

1. Business Environment: C B Gupta
2. Business Environment: Francis Cherunilam
3. Business Environment: Dr. P.K Ghosh
4. The International Business Environment: Janet Morrison & Palgrave

**SEMESTER II**  
**2B03BBA : BUSINESS COMMUNICATION**

|                  |                                                                                                                                                                                                                                                                                                         |                         |                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------------------|
| <b>Objective</b> | 1. To understand the concept, process and importance of communication.<br>2. To gain knowledge of media of communication.<br>3. To develop skills of effective communication - both written and oral.<br>4. To help students to acquaint with application of communication skills in the business world |                         |                                 |
| <b>Pedagogy</b>  | Lectures, Assignments, Practical exercises, Seminars, etc.                                                                                                                                                                                                                                              |                         |                                 |
| <b>Core III</b>  | 3 Credits                                                                                                                                                                                                                                                                                               | 3 Teaching hrs per week | 3 Hrs. End Sem. Exam : Marks 40 |

**Module I:**

Introduction to Business Communication, Characteristics of Effective Organizational Communication, Basic Forms of Communication, Process of Communication, Principles of Effective Business Communication, 7 C's.

**Module II:**

Barriers to Communication, Facilitators to Communication, Effective Listening, Perception & Reality, Role of Opinion, Attitudes & Beliefs, , Mal-functions of communication, Business Etiquette,

**Module III:**

Forms of Business Communication, Written Communication, Oral Communication, Non verbal Communication, Technology of Business Communication, Peculiarities of Communication in Indian Organizations, Conflict Management.

**Module IV:**

Conduct of Meeting- Agenda, Notice, Notes, Minutes, Office Memorandum, Office Orders, Press Release, Business Letter Writing-Need, functions & Kinds, Layout of letter writing, Types of letter writing, Report writing- Problems, Organization and techniques of writing.

**References:**

1. Organizational Communication: The Effective Management : Phillip, Louis V.
2. Technical Communication: Principles and Practice : Raman, Meenakshi and Sharma, Sangeeta
3. The Management of Public Relations : Ross, Robert D.
4. Principles and Practice of Commercial Correspondence : Stephenson, James



## SEMESTER II

### 2C03BBA : QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

|                          |                                                                                                                                                                                                                |                            |                               |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------|
| <b>Objective</b>         | To familiarize the student with the use of quantitative techniques in managerial decision making, Also the subject aims at developing analytical thinking and logical reasoning for effective decision making. |                            |                               |
| <b>Pedagogy</b>          | Lectures, Assignments, Practical exercises, case discussion, seminars etc.                                                                                                                                     |                            |                               |
| <b>Complementary III</b> | 3 credits                                                                                                                                                                                                      | 5 Teaching hours. per week | 3 Hrs. End Sem. Exam Marks 40 |

#### Module I:

**Quantitative Techniques**-Introduction-Meaning and definition-Application of Quantitative Techniques in business-Limitations

#### Module II:

**Probability** -Concept of Probability-Meaning and definition-Approaches to probability-Theorems of probability-Addition theorem-Multiplication theorem-Conditional probability-Inverse probability-Bayes's theorem.

#### Module III:

**Theoretical Distribution** - Binomial distribution - Basic assumptions and characteristics - Fitting of binomial distribution - Poisson distribution - characteristics - Fitting of Poisson distribution -Normal distribution - features and properties - Standard normal curve.

#### Module IV:

**Statistical Inference** - Testing of hypothesis – Procedure - error in testing - Two tail test and one tail test - Non parametric tests - Chi-Square test. Parametric tests - Z test-test of significance of large samples - Test for two sample means - Small sample mean tests - Student t test - Analysis of variance - F test - one way ANOVA test.

#### References:

1. Quantitative Techniques for Management :.Levine
2. Quantitative Techniques in Management : Vohra
3. Mathematics for Management : M.Raghavachari
4. Operations Research (Methods & Problems) :Kanthi Swarup, Gupta .R.K. & K. Manmohan
5. Principles of Operation Research :Wanger H.M.

**SEMESTER III**  
**3A11COM/BBA : IT in Business**

|                         |                                                                                                                                                                                                                                                                                                      |                                                  |                                                    |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------|
| <b>Objectives</b>       | 1. To acquaint with the Information technology infrastructure<br>2. To understand the concept and application of management information system<br>3. To understand the scope and key issues involved in managing electronic commerce initiatives<br>4. To enable the optimum utilization of internet |                                                  |                                                    |
| <b>Pedagogy</b>         | Lectures, Assignments, Practical exercises, Seminars, etc.                                                                                                                                                                                                                                           |                                                  |                                                    |
| <b>Common Course XI</b> | 3 Credits<br>1 Credit<br>(Pr)                                                                                                                                                                                                                                                                        | 3 Teaching hrs per week<br>2 Teaching Hours (Pr) | 2 Hrs. End Sem. Exam :<br>Marks 30; Pra : 10 marks |

**Module I:**

**Information Technology Infrastructure** - Computer system – computer processing – storage – Input and output technology – classifying computers – Computer networks – Client server computing – types of software –database management systems – types of data bases –data warehouses and data mining – management requirements for database systems

**Module II:**

**Management Information System**– business perspective on information system – approaches to information systems – Information systems in organizations – six major types of systems – systems from a functional perspective – Organizations and information systems – features of organizations – role of managers in organizations – managers and decision making.

**Module III:**

**Electronic Business** - Internet technology and the digital firm – traditional commerce and e commerce – Internet business models – e commerce categories Business to Consumer – Business to Business – Consumer to Consumer - E commerce payment system – intranet support for e commerce – security threat to e commerce - Designing for security - Virus - Security Protection and Recovery - Encryption - Authentication and Trust - Key management - Internet Security Protocols and Standards

**Module IV:**

**Social Informatics** - Knowledge skills for higher education - Internet as a knowledge repository, academic search techniques, creating cyber presence, case study of academic websites, introduction to use of IT in teaching and learning, Social Informatics - e-Governance applications at national and state level.

**Practical**

1. Acquire competence in using office packages such as MS word, MS Excel and MS PowerPoint.
2. Familiarize with popular e-commerce sites
3. Practically use internet for academic purposes

**References:**

1. Management Information Systems – Managing the digital firm, Pearson Education.: Kenneth C Laudon and Jane P Laudon:
2. E Commerce 4<sup>th</sup> Annual Edition, Thomson Course Technology : Gary P Schneider
3. Technology in Action: Pearson Education

## SEMESTER III

### 3A12COM/ BBA : NUMERICAL SKILLS

|                          |                                                                                                                                                                                                                                                                           |                          |                               |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------|
| <b>Objective</b>         | 1. To provide a sound working base in numerical methods<br>2. To increase the student's ability to apply proper mathematical tools to specific business situation<br>3. To exposes the students to the study of numerical skills as powerful tool in scientific computing |                          |                               |
| <b>Pedagogy</b>          | Lectures, Assignments, Practical exercises, Case Discussion, Seminars etc.                                                                                                                                                                                                |                          |                               |
| <b>Common Course XII</b> | 4 credits                                                                                                                                                                                                                                                                 | 4 Teaching hrs. per week | 3 Hrs. End Sem. Exam Marks 40 |

#### Module I:

**Arithmetic :** Average, mixtures- Ratios and proportions- Computation of interest, Simple Interest, compound interest, effective yield- future value, present value -Amortization, Depreciation, Continuous compounding

#### Module II:

**Algebra:** Real and imaginary number- Rational and Irrational Number- Set Theory and simple application of Venn Diagram- Elements of Co-ordinate system- Matrices, Fundamental ideas about Matrices and their operational rules – Inverse of a Matrix.

#### Module III:

**Theory of equations:** meaning, types of equations - simple linear and simultaneous equations (only two variables) eliminations and substitution method only. Quadratic equation factorization and formula method ( $ax^2+bx+c=0$  form only) Problems on business application.

#### Module IV:

**Progression:** Arithmetic progressions finding the 'n'th term of an AP and also sum to n terms of AP. Insertion of Arithmetic means in given terms of AP and representation of AP. Geometric progression. Finding the nth term of GP. Insertion of GMs in given GP and also representation of GP - Mathematics of finance simple and compound interest. (Simple problems only).

#### References:

1. Applied Numerical Analysis P.K Kandasamy, K.Thilakavathi, Gunavathi:
2. Numerical Methods: Gerald.
3. Essentials of college mathematics for Business, Economics, life Science and Social Sciences : Raymond Barnett, Michael Ziegler.

## SEMESTER III

### 3B04 BBA (Core IV) : FINANCIAL ACCOUNTING

|                       |                                                                                                                                          |                          |                               |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------|
| <b>Objectives</b>     | The objective of this course is to provide knowledge about Accounting Principles and their application in different business situations. |                          |                               |
| <b>Pedagogy</b>       | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.                                                               |                          |                               |
| <b>Core Course IV</b> | 4 Credits                                                                                                                                | 5 Teaching hrs. Per week | 3 Hrs. End Sem. Exam Marks 40 |

#### Module I:

**Introduction: Accounting:** a financial information system – inputs and outputs of accounting system – generally accepted accounting principles, concepts and conventions.

#### Module II:

**Final Accounts of sole Trading concern:** construction of Manufacturing, Trading and profile and loss Account and Balance sheet with adjustments for prepaid and outstanding expenses, unearned and accrued incomes, provision for bad and doubtful debts and provision for discount on debtors and creditors.

#### Module III:

**Partnership Accounts:** Accounting problems related to admission, retirement and death of a partner.

#### Module IV:

**Company Accounts:** Share capital of a company – Types of shares – Accounting entries on issue of shares for cash – forfeiture of shares – Re-issue of forfeited shares. – Issue of preference shares and Debentures.

#### References:

1. Financial Accounting for Managers: Shukla & Grewal
2. Advanced Accounting: Jain & Narang
3. Advanced Accounting: R.L Gupta
4. Advanced Accounting: S.N Maheshwary

## SEMESTER III

### 3B05 BBA (Core V) : OPERATIONS MANAGEMENT

|                      |                                                                                                                                                                    |                         |                                  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------|
| <b>Objectives</b>    | The objective is to get the students acquainted with the design aspects of operations and materials management and to develop relevant skill in managing the same. |                         |                                  |
| <b>Pedagogy</b>      | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.                                                                                         |                         |                                  |
| <b>Core Course V</b> | 3 Credits                                                                                                                                                          | 4 Teaching hrs per week | 3 Hrs. End Sem. Exam    Marks 40 |

#### Module I:

**Nature and Scope of Production and operations Management:** its relationship with other systems in the organization, factors affecting system and concept of production and operation management. Facility location, types of manufacturing systems and layouts, layout planning and analysis.

#### Module II:

**Functions of production and material management:** types of production systems, productivity variables, and productivity measurement, production planning and control, in mass production in batch production, job order manufacturing, production selection, product design, and development, process selection, facility location, facility layout, capacity design, determination of material required.

#### Module III:

**Materials Management:** Concepts, Objectives, Functions Purchasing Management - Objectives; Functions; Methods; Procedure Management - Types of Stores; Functions; Coding Methods. Value Analysis Concepts Inventory Management Objectives, Factors, Process, Inventory control techniques - ABC, VED, EOQ, SED, FSN analysis. Maintenance Management - Concepts; Objectives; Functions; Types of Maintenance

#### Module IV:

**Quality management:** Introduction; Meaning; Quality characteristics of goods and services; Tools and techniques for quality improvement: check sheet, histogram, scatter diagram, cause and effect diagram, Pareto chart, process diagram, statistical process control chart; Quality assurance; Total quality management (TQM) model; Service quality, concept of Six Sigma and its application. Advanced Manufacturing Technologies: JIT, TOC, Lean/ Green Manufacturing, WCM etc. and safety concepts

#### References:

1. Production Management : Aswathappa
2. Production Management: Panneerselvem
3. Essentials of Operations Management: Slack, Pearson

## SEMESTER III

### 3C04 BBA: LEGAL ASPECTS OF BUSINESS

|                         |                                                                                                                                               |                          |                               |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------|
| <b>Objectives</b>       | The purpose of this course is to acquaint students with various laws, forces and regulatory measures governing business operations in India . |                          |                               |
| <b>Pedagogy</b>         | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.                                                                    |                          |                               |
| <b>Complementary IV</b> | 3 Credits                                                                                                                                     | 5 Teaching hrs. Per week | 3 Hrs. End Sem. Exam Marks 40 |

#### **Module I:**

**The Indian Contract Act:** Essentials of a valid contract, void agreements, performance of contracts, breach of contract and its remedies, Quasi-Contracts

#### **Module II:**

**The Sale of Goods Act:** Contract of sale of goods, conditions and warranties, transfer of property, rights of an unpaid seller; the negotiable instruments act: nature and types; negotiation and Assignment; holder-in-due course, dishonour and discharge of a negotiable instrument, arbitration

#### **Module III:**

**Companies Act:** The Companies Act, 1956, Companies Act, 2013 (Amendments) Nature and types of companies; formation; memorandum and articles of association; prospectus, shares and share capital, allotment of shares

#### **Module IV:**

Membership; borrowing powers; management and meetings; accounts and audit; compromise arrangements and reconstruction; prevention of oppression and mismanagement; winding up; Consumer Protection Act and Cyber Law

#### **References:**

1. Business Legislation Management.: Kuchhal, M.C. and Deepa Parkash.
2. Business Law :Kuchhal , M.C.
3. Mercantile Law including Industrial Law: Kapoor, N. D.
4. Business Law : Gulshan, S. S,

**SEMESTER**  
**3BO6BBA(Core VI) : Managerial Skill Development Course (MSDC)**

|                       |                                                                                                                                                                |                         |                     |          |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------|
| <b>Objectives</b>     | 1. To enable the students to understand various budget proposals and its impact on the business sector<br>2. To understand the economic scenario of the nation |                         |                     |          |
| <b>Pedagogy</b>       | Lectures, Assignments, Group Discussions, Seminars, Presentations etc.                                                                                         |                         |                     |          |
| <b>Core Course VI</b> | 1 Credit                                                                                                                                                       | 2 Teaching hrs per week | Internal Evaluation | Marks 50 |

**Current Business Scenario**

Various sectors of business – Major companies operating in each sector – top level management of popular companies – news related to the performance of major companies – Various products and services offered by major companies – major brands in each product/ service category – new products/brands being launched – Introduction to stock Market – BSE sensex – NSE nifty – monitoring of changes in indices – other current business news.

**Economic Survey**

Major highlights of the Economic survey – State of the economy – Demographic aspects – Public finance – Price situation – Balance of payment – International trade – Sector wise performance

**Union Budget**

The Economy and the challenges – The plan and budgetary allocation – Investment, Infrastructure and Industry – Financial sector – Other proposals  
 Tax Proposals – Direct Taxes – Indirect taxes – Budget at a glance (Central & State) – Receipts – Expenditure – Central plan outlay – Review of the budget proposals – Impact of tax proposals

**Soft Skills/ Employability skills**

The above knowledge areas shall be handled in such way that it will enhance the soft skills/Employability skills of the students. The pedagogy shall be designed by keeping this objective in mind. It shall be ensured that the employability skills such as Communication, Team work, Self learning, Initiative, Planning, Self management, Ability to use technology etc.

**References:**

1. Business and Economic News Papers
2. Journals, Magazines and Reports in current affairs.

## SEMESTER IV

### 4A13COM/BBA : ENTREPRENEURSHIP DEVELOPMENT & PROJECT MANAGEMENT

|                    |                                                                                                                                                                                 |                         |                               |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------|
| <b>Objective</b>   | This course is intended to acquaint the students with the basic theories of Entrepreneurship and Project management and to motivate them to take up Entrepreneurial Activities. |                         |                               |
| <b>Pedagogy</b>    | Lectures, Assignments, Practical exercises, Seminars, etc.                                                                                                                      |                         |                               |
| <b>Common XIII</b> | 4 Credits                                                                                                                                                                       | 4 Teaching hrs per week | 3 Hrs. End Sem. Exam Marks 40 |

#### Module I:

**Concept of Entrepreneurship**- importance- definition of entrepreneur- characteristics- functions- Distinction between an entrepreneur and a manager- concept of Women entrepreneurship- problems of women entrepreneurs- factors affecting entrepreneurial growth- Rural entrepreneurship- role of entrepreneurs in economic growth- Small scale business- characteristics- objectives- problems- Institutional finance to entrepreneurs, MSME- Features and Problems.

#### Module II:

**Project Management:** Projects - features- classification- legal requirements for establishing a new unit- project identification- sources- screening- project formulation- preparation of report.

#### Module III:

**Technical analysis** - elements- Financial analysis- components- various financing schemes of financial institutions- projected Profit & Loss account, balance sheet and cash flow statement.

#### Module IV:

**Project Appraisal**- techniques- SCBA- L&M- UNIDO approach- **Project report preparation**- contents- **Project management techniques**- PERT, CPM- scheduling- resource allocation- resource smoothing- time and cost overrun- Project review- phases of project review- abandonment analysis.

#### References:

1. Dynamics of Entrepreneurship Development : Vasant Desai.
2. Entrepreneurship: New Venture Creation : David H. Holt
3. Entrepreneurship Development New Venture Creation: Satish Taneja, S.L. Gupta
4. Project Management: K. Nagarajan.
5. Entrepreneurship: Strategies and Resources : Marc J. Dollinger



**SEMESTER IV**  
**4A14COM/BBA-BUSINESS ETHICS AND CSR**

|                   |                                                                                            |                         |                                  |
|-------------------|--------------------------------------------------------------------------------------------|-------------------------|----------------------------------|
| <b>Objective</b>  | To give an overview of the ethical aspects of Business and Corporate Social Responsibility |                         |                                  |
| <b>Pedagogy</b>   | Lectures, Assignments, Practical exercises, Seminars, etc.                                 |                         |                                  |
| <b>Common XIV</b> | 4 Credits                                                                                  | 4 Teaching hrs per week | 3 Hrs. End Sem. Exam Marks<br>40 |

**Module I:**

**Business Ethics:** An Overview - Nature of Ethics – Relationship between Ethics and Business – The Unitarian view of ethics – The separatist view of Ethics – The Integration view of Ethics – Need for Business Ethics – Importance of Ethics in Business

**Module II:**

**Ethical Issues:** in Business Ethical Issues in Marketing Management- Ethical Issues in Operations Management – Ethical Issues in Human Resource Management – Ethical Issues in Finance – Ethical issues in Accounting and Other functions

**Module III:**

**Corporate Social Responsibility:** Historical Perspective – Internal and External Stakeholders - Share holders – Employees – Management – Consumers – Suppliers – Creditors – Competitors - Community

**Module IV:**

**The Role of Business in Society:** An Overview – The Economic Role – Tasks of Business in Society – Managerial and Political Tasks – The Social Change – Standard and values

**References:**

1. Business Ethics, Crane & Matten
2. Corporate Governance 2/e Mallin
3. The Management and ethics omnibus- Chakraborty
4. Values and Ethics for Organizations, Chakraborty
5. Perspectives in Business Ethics, Hartman, Chatterjee

**SEMESTER IV**  
**4B07 BBA (Core VII) – MARKETING MANAGEMENT**

|                        |                                                                                                                                      |                            |                                  |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------|
| <b>Objective</b>       | To acquaint the students with the Marketing principles and practices, and, to understand the process of Marketing in a business firm |                            |                                  |
| <b>Pedagogy</b>        | Lectures, Assignments, Practical exercises, case discussion, seminars etc.                                                           |                            |                                  |
| <b>Core course VII</b> | 3 credits                                                                                                                            | 4 teaching hours. per week | 3 Hrs. End Sem. Exam Marks<br>40 |

**Module I:**

**Marketing:** nature and scope of Marketing; Marketing concepts- traditional and modern; selling and Marketing; Marketing mix; Marketing environment; service Marketing- characteristics of service. Consumer behavior and Market segmentation: nature, scope and significance of consumer behavior; Market segmentation- concept and importance; bases for Market segmentation.

**Module II:**

**Product:** concept of product; consumer and industrial goods; product planning and development; packaging- role and functions; branding: brand name and trade Marks; product life cycle; after sales service. Price: importance of price in Marketing mix; factors affecting price; discounts and rebates; pricing strategies. Promotion: promotion mix; methods of promotion; advertising; personal selling; selling as a career; functions of a salesman; characteristics of a good salesman; approach and presentation to a customer; objection handling; closing sale and follow up; publicity and public relations. Distribution: physical distribution; channels of distribution-concept and role; types of channels; factors affecting choice of a particular channel; physical distribution of goods; transportation- modes; retail formats- supermarkets, hyper Markets, chain stores, department stores, discount stores, margin free Markets, electronic retailing.

**Module III:**

**Advertising:** functions of advertising; advertising media; different types of media; relative merits and demerits; characteristics of effective advertisement; measuring media effectiveness; media planning and scheduling; Legal and ethical aspects of advertising.

**Module IV:**

**Sales Promotion:** meaning, nature and functions; limitations of sales promotion; sales promotion schemes: sample, coupon, price off, premium plan, consumer contests, sweep stakes, POP displays, demonstration, trade fairs and exhibitions; sales promotion techniques and sales force.

**References:**

1. Marketing Management: Kotler, Philip
2. Basic Marketing Concepts, Decisions and Strategy : Condif E.W. and Still, R.R
3. Fundamentals of Marketing : Stanton W.J. Etzel Michael J and Walter Bruce J
4. Advertising and Promotion Management : Rorsiter Johan R, Percy Larr y.

**SEMESTER IV**  
**4B08 BBA (Core VIII) : CORPORATE ACCOUNTING**

|                   |                                                                                                                                                                                                |                          |                                  |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------|
| <b>Objectives</b> | The objective of this course is to help the students to acquire conceptual knowledge of the fundamentals of the corporate accounting and the techniques of preparing the financial statements. |                          |                                  |
| <b>Pedagogy</b>   | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.                                                                                                                     |                          |                                  |
| <b>Core VIII</b>  | 3 Credits                                                                                                                                                                                      | 5 Teaching hrs. Per week | 3 Hrs. End Sem. Exam Marks<br>40 |

**Module I:**

Final accounts of companies - preparation of balance sheet and profit and loss account.

**Module II:**

Acquisition & Profits prior to incorporation – meaning computation of purchase consideration – acquisition entries in the books of the company (closing entries in Vendor’s books not necessary) – computation of profits prior to incorporation – treatment of prior profit or loss.

**Module III:**

Accounting for Amalgamation – Meaning and types of amalgamation - Purchase consideration – Accounting entries in the books of both transfer and transferee companies (excluding inter – company holdings).

**Module IV:**

Reconstruction – types – internal & external reconstructions – Accounting entries.

**References:**

1. Advanced Accounts Volume II : Shukla M.C., T.S.Grewal and S.C.Guptha
2. Advanced Accountancy, Volume II : Guptha R.L. and M.Radhaswami
3. Corporate Accounting : Maheshwari. S.N. and S.K.Maheshwari,
4. Corporate Accounting : Ashok Sehgal and Deepak Sehga
5. Corporate Accounting : S.P. Jain and K.L.Narang
6. Fundamentals of Corporate : Monga

**SEMESTER IV**  
**4B09 BBA (Core IX): FINANCIAL MANAGEMENT**

|                       |                                                                                                                                                                            |                          |                                  |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------|
| <b>Objectives</b>     | To familiarize the students with the fundamental principles of financial management and to equip them with the tools of effectively managing the finance of an enterprise. |                          |                                  |
| <b>Pedagogy</b>       | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.                                                                                                 |                          |                                  |
| <b>Core Course IX</b> | 3 Credits                                                                                                                                                                  | 4 Teaching hrs. Per week | 3 Hrs. End Sem. Exam Marks<br>40 |

**Module I:**

**Financial Management:** Meaning, Scope and objectives – profit maximization – wealth maximization.

**Module II:**

**Cost of Capital:** Meaning & importance computation of cost of Debt – Cost of PReferences Capital - cost of Equity - Weighted Average Cost of Capital. Capital Structure – Meaning financial structure –overcapitalization – under capitalisation - factor affecting Capital structure – EBIT – EPS analysis.

**Module III:**

**Management of Working Capital:** Definition and concepts of working capital – factors affecting. Working capital- financial of working capital – Management of cash, receivables and inventory.

**Module IV:**

**Capital Budgeting:** Meaning - importance - investment project evaluation techniques- Payback period – Average rate of return - Net Present Value Methods - Profitability Index - I.R.R.

**References:**

1. Financial Management: M .Y Khan & P.K Jain
2. Financial Management: I M Pandey
3. Financial Management: R.K. Sharue & Shakhi K. Gupta
4. Financial Management: Prasanna Chandra.
5. Financial Management: Geoffrey Knott

**SEMESTER IV**  
**4CO5BBA : BUSINESS RESEARCH METHODS**

|                        |                                                                                                                                                                  |                         |                                  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------|
| <b>Objective</b>       | To enable students for acquiring basic knowledge in business research methods and to develop basic skills in them to conduct survey researches and case studies. |                         |                                  |
| <b>Pedagogy</b>        | Lectures, Assignments, Practical exercises, Seminars, etc.                                                                                                       |                         |                                  |
| <b>Complementary V</b> | 3 Credits                                                                                                                                                        | 4 Teaching hrs per week | 3 Hrs. End Sem. Exam Marks<br>40 |

**Module I:**

**Business Research:** meaning and definition – features of business research – operational definition – theory – concept – variable – proposition – hypothesis – types of business research – basic and applied, exploratory, descriptive and causal – phases of business research.

**Module II:**

**Exploratory Research :** objectives – methods – experience survey – secondary data analysis – case study – pilot study by focus group interview – process of problem definition – understanding the background of the problem – determination of unit of analysis – determine the relevant variables and state the research questions – hypothesis and research objectives.

**Module III:**

**Meaning of Research Design :** methods of descriptive and causal research – survey – experiments – secondary data studies and observation – sampling design – simple random sampling – restricted random sampling – stratified, cluster and systematic – non random sampling – convenient and judgment sampling.

**Module IV:**

**Measurement and Scaling :** nominal – ordinal – interval and ratio scale – criteria for good measurement – reliability and validity – designing questionnaire – means of survey data collection – personal interview – telephonic, mail and internet.

**Module V:**

**Data Processing :** processing stages – editing – coding and data entry – descriptive analysis under different types of measurements – percentages, frequency table – contingency table – graphs – interpretation. Preparation of research report – format – report writing stages – gathering material and data – make overall format – make detailed outline – write first draft – rewrite – final word processing and publishing.

**References :**

1. Business Research Methods : Donald R. Cooper and Pamela S. Schindler
2. Marketing Research : Naresh K. Malhot
3. Business Research Methods : William G. Zikmund

**SEMESTER V**  
**5B11 BBA (Core XI) : COST ACCOUNTING**

|                       |                                                                                                                                        |                            |                               |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------|
| <b>Objective</b>      | To acquaint students with methods and techniques of cost and management accounting at an advanced field for managerial decision making |                            |                               |
| <b>Pedagogy</b>       | Lectures, Assignments, Practical exercises, case discussion, seminars etc.                                                             |                            |                               |
| <b>Core course XI</b> | 4 credits                                                                                                                              | 5 teaching hours. per week | 3 Hrs. End Sem. Exam Marks 40 |

**Module I:**

**Introduction to cost accounting:** concepts ,objectives and uses –financial accounting and cost accounting –Elements of cost and cost classification –cost centre and cost unit, preparation of cost sheet

**Module II:**

**Elements of cost:** Material-concept, control of purchase and purchase procedure-Storage and issue of materials –method of material issue pricing (FIFO,LIFO,Simple and Weighted averages),Stock levels-E.O.Q -ABC Analysis- VED Analysis. Labour-concept –Time keeping –Wage s system –time rate, piece rate, Taylor’s differential piece rate system-Incentive system of wage payment –Halsey and rowan plan –Treatment of idle time –over time –Labour turn over - Over heads-concepts ,classification, Allocation and apportionment –Absorption of overheads –Under and over absorption of over heads.

**Module III:**

**Costing methods:** Units/Output –job costing –batch costing –Contract costing –treatment of profit in incomplete contracts.

**Module IV:**

**Process costing:** Characteristics of process costing and job order costing –process losses-Normal and abnormal losses

**References :**

1. Cost Accounting : S.P Jain &K.L Narang
2. Cost accounting : Dr. A.D. Agarwal
3. Management accounting : R.K Sharma &S.K Gupta

**SEMESTER V**  
**5B12 BBA(Core XII) : HUMAN RESOURCE MANAGEMENT**

|                        |                                                                                  |                         |                               |
|------------------------|----------------------------------------------------------------------------------|-------------------------|-------------------------------|
| <b>Objective</b>       | To give a conceptual understanding of human resource practices in organizations. |                         |                               |
| <b>Pedagogy</b>        | Lectures, Assignments, Practical exercises, Seminars, etc.                       |                         |                               |
| <b>Core Course XII</b> | 4 Credits                                                                        | 5 Teaching hrs per week | 3 Hrs. End Sem. Exam Marks 40 |

**Module I:**

**Introduction to Human Resource Management:** Importance - scope and objectives of HRM. Evolution of the concept of HRM - Approaches to HRM - Personnel management Vs Human Resource Management - HRM and competitive advantage - Traditional Vs Strategic human resource management.

**Module II:**

**Human Resource Planning:** Recruitment and selection – Recruitment source of recruitment methods. Job analysis - process of job analysis-job description- job specification-- methods of job analysis –job evaluation.

**Module III:**

**Placement:** Induction and Internal mobility of human resource. Training of employees - need for training - objectives - approaches – methods - training environment - areas of training - Training evaluation. Performance appraisal - need, importance methods and problems of performance appraisal.

**Module IV:**

**Compensation management and Grievance Redressal:** Compensation planning- objectives- Wage systems- factors influencing wage system. Grievance redressal procedure- discipline- Approaches - punishment-essentials of a good discipline system

**References:**

1. Human Resource Management - Text and Cases : VSP Rao:
2. Human Resource Management : Snell, Bohlander :
3. Personal Management and Human Resources : Venkata Ratnam & Srivasthava
4. A Hand Book of Personnel Management Practice: Dale Yolder:

**SEMESTER V**  
**5B13 BBA (Core XIII): BANKING THEORY, LAW AND PRACTICE**

|                   |                                                                                                                                                                  |                          |                               |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------|
| <b>Objectives</b> | To give the students an exposure to the dynamics of banking business environment and enable them to analyse business priorities in the changing banking industry |                          |                               |
| <b>Pedagogy</b>   | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.                                                                                       |                          |                               |
| <b>Core XIII</b>  | 3 Credits                                                                                                                                                        | 4 Teaching hrs. Per week | 3 Hrs. End Sem. Exam Marks 40 |

**Module I:**

**Introduction to banking system:** Functions of Banks, Role of RBI and its Functions, played by them-Salient features of status governed by them- Monetary Policy, Fiscal Policy Banking Regulation Act, 1949

**Module II:**

**Commercial Banks:** Functions – Accepting Deposits – Lending of Funds – Emerging trends in banking – e banking, mobile banking, ATM cards, debit cards, On line banking, Electronic Fund Transfer, Electronic Clearing System.

**Module III:**

**Opening of an Account:** Types of Deposit Accounts – Types of Customers – Principles of Lending, Types of Borrowings, Customer Grievances and Redressal – Ombudsman.

**Module IV:**

**Negotiable Instruments:** Promissory Notes, Bills of Exchange, Cheque, Draft- Definition, Features, - Crossing – Endorsement – Material Alteration – Paying Banker – rights and duties – statutory Protection – Dishonour of cheques – Role of Collecting banker.

**References:**

1. Banking Law Theory and Practice : Sundaram and Varshney
2. Banking Law Theory and Practice :S N Maheswari
3. Banking Law Theory and Practice : Sherlaker and Sherlaker.



**SEMESTER V**  
**5B14BBA (Core XIV) : ORGANISATIONAL BEHAVIOUR**

|                        |                                                                                                                                                                                          |                         |                                  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------|
| <b>Objective</b>       | To familiarize the students with the basic concepts of the organizational behaviour and to enhance their understanding of the interaction between the individuals and the organizations. |                         |                                  |
| <b>Pedagogy</b>        | Lectures, Assignments, Practical exercises, Seminars, etc.                                                                                                                               |                         |                                  |
| <b>Core Course XIV</b> | 4 Credits                                                                                                                                                                                | 5 Teaching hrs per week | 3 Hrs. End Sem. Exam Marks<br>40 |

**Module I:**

**Organizational Behaviour:** concepts, meaning, nature, scope features of OB.- OB and other disciplines. Individual behaviour—basic psychological process—personality, determinants of personality- personality traits

**Module II:**

**Perception:** factors affecting perception-learning, theories of learning—social learning. Motivation—theories of motivation (Maslow’s, Hertzberg, Mc Greger, X and Y theory) financial and non financial motivation.

**Module III:**

**Group :** - concept of group dynamics—features of group—types of group behaviour—formal and informal group behaviour—stages of group development—group moral—group norms—group Cohesiveness..Leaderships- types—theories of leadership (Trait theory, Michigan studies and Fideler’s contingency model) leadership styles.

**Module IV:**

**Stress Management:** meaning, types of stress—consequences of work stress—causes of stress. Conflict, types of conflicts, conflict resolution—Organisational development-meaning, need, benefits and limitations of OD—steps in OD. Organizational changes.

**References:**

1. Organisational Behavior : Fred Luthans
2. Managing individual and group behaviour in organization : Danial C. Fieldman and Hugh Arnold
3. The structure of organization : Henry Mintzberg
4. Organization theory and design : Edwin Gerlof

**SEMESTER V**  
**5B15 BBA(Core XV) : RETAIL MANAGEMENT**

|                       |                                                                                                                                                           |                            |                                  |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------|
| <b>Objective</b>      | Understand effective methods and strategies required for retail management. Understand how to utilize resources and techniques used in retail management. |                            |                                  |
| <b>Pedagogy</b>       | Lectures, Assignments, Practical exercises, Seminars, etc.                                                                                                |                            |                                  |
| <b>Core Course XV</b> | 3<br>Credits                                                                                                                                              | 4 Teaching hrs per<br>week | 3 Hrs. End Sem. Exam Marks<br>40 |

**Module I:**

**Retailing:** Meaning –nature-scope-objectives and functions-Retailer-definitions and functions of retailer-retailing scenario in India-Global retail Market-issues and challenges-Wheel of retailing -retailing life cycle –types of retailing –ownership based, store based and non store based retailing-retail environment and customers

**Module II:**

**Retail Operation Management:** Budgeting and resource allocation-store format and size decision –store layout and space allocation –store security aspect –credit management –working capital for retailing –cash collection and recovery.

**Module III:**

**Merchandise Management:** Meaning factors affecting buying function-merchandise planning-merchandise sourcing –retail pricing –evaluating merchandise performance.

**Module IV:**

**Retail promotion:** Building retail store image-role of atmosphere-layout planning –retail promotion mix-sales promotion scheme-public relation in retailing –CRM in retailing-retail control system-financial control, Merchandise control, human resource control, operation control.

**References:**

1. Retail management : Cox Roger
2. Retail management : Levy, Michael
3. Marketing Management : Philip Kotler

**SEMESTER V**  
**OPEN COURSE – OPTION 1**  
**5D01BBA (Open): BASIC ACCOUNTING**

|                    |                                                                                   |                          |                               |
|--------------------|-----------------------------------------------------------------------------------|--------------------------|-------------------------------|
| <b>Objectives</b>  | To enable the students to acquire knowledge of accounting principles and practice |                          |                               |
| <b>Pedagogy</b>    | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.        |                          |                               |
| <b>Open Course</b> | 2 Credits                                                                         | 2 Teaching hrs. Per week | 3 Hrs. End Sem. Exam Marks 40 |

**Module I:**

**Basic Accounting concepts:** Kinds of Accounts – Financial Accounting vs. Cost Accounting - Financial Accounting vs. Management Accounting - Double Entry Book Keeping – Rules of Debit and Credit – Preparation of Journal and Ledger Accounts problems

**Module II:**

**Subsidiary books :** cash book – types of cash book - problems - purchase book - sales book - sales return - purchase return books – Journal proper

**Module III:**

**Trial balance:** Errors – types of errors - Rectification of errors – problems –

**Module IV:**

**Financial Statements:** Manufacturing, Trading and Profit & Loss Account - Balance sheet – Problems with simple adjustments.

**References:**

1. Double Entry Book Keeping : Grewal, T.S:
2. Advanced Accounting : R.L Gupta
3. Advanced Accounting : Jain & Narang
4. Advanced Accounting : S.N Maheshwary

## SEMESTER V

### OPEN COURSE : OPTION 2

#### 5DO1 BBA (Open) : FINANCIAL SYSTEM AND SERVICES

|                    |                                                                                                                                                        |                          |                               |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------|
| <b>Objectives</b>  | To enable the students to explore the Indian Financial System, its constituents and the services provided by them in the globalised economic scenario. |                          |                               |
| <b>Pedagogy</b>    | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.                                                                             |                          |                               |
| <b>Open Course</b> | 2 Credits                                                                                                                                              | 2 Teaching hrs. Per week | 3 Hrs. End Sem. Exam Marks 40 |

#### Module I:

**Financial System:** Meaning- Indian Financial System-Regulators-RBI-SEBI-IRDA. Financial Intermediaries: Banking Institutions. Non- Banking Institutions - Mutual Funds-Insurance companies -Housing finance Companies-Financial Markets-Capital Markets & Money Markets -Financial Instruments: short-medium-long term

#### Module II:

**Banking Institutions:** Commercial Banks-Branch banking Vs Unit banking - Functions and Services-credit creation – modern trends in commercial banking-ATM- Credit-cards-community services banking. Development banks: IDBI, IFCI, SIDBI, NABARD, NHB, EXIM BANK, ADB, IMF, IBRD

#### Module III:

**Financial Services:** meaning-importance- components-Depository Services- Custodial services- Credit Rating-Factoring- Forfeiting - merchant Banking-Leasing-Hire purchase-Guaranteeing-Portfolio management-Under writing-Venture capital. (Basic Concepts only)

#### References :

1. Indian Financial System : Bharati V .Pathak
2. Merchant Banking and Financial services : Dr .S.Gurusamy
3. Indian Financial system : Dr .S. Gurusamy
4. Indian Financial system : P.N.Varshney D.K.Mittal
5. Financial Services : D.Joseph Anbarasa ,V.K.Boominathan P.Manoharan

## SEMESTER V

### OPEN COURSE – OPTION 3

#### 5D01BBA : DISASTER MANAGEMENT

|                    |                                                                                                                    |                          |                               |
|--------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------|
| <b>Objectives</b>  | To enable the students to gain awareness and competence and for developing an attitude toward Disaster management. |                          |                               |
| <b>Pedagogy</b>    | Lectures, Assignments, Practical Exercises, Case Discussion, Seminars etc.                                         |                          |                               |
| <b>Open Course</b> | 2 Credits                                                                                                          | 2 Teaching hrs. Per week | 3 Hrs. End Sem. Exam Marks 40 |

#### **Module I:**

**Environmental Hazards and Disasters-** Introduction to Disaster management-Environmental Disaster-Approaches to Environmental Disasters.

#### **Module II:**

**Types of Environmental Hazards and Disasters-** Volcanic eruption- Earthquake Hazards- landslides-cyclones-Hailstorms-Floods-Droughts-Cold Waves-Heat Waves-Man induced Hazard and Disasters.

#### **Module III:**

**Approaches in Disaster Management-** Pre Disaster stage (Preparedness)-Emergency-Post Disaster stage (Rehabilitation)-Community Based Disaster Management (CBDM).

#### **Module IV:**

**Natural Disaster Reduction And Management-** Prediction and warning of Hazard and Disasters- Disaster mitigation agencies and Organizations- Contingency Management preparedness-

#### **References:**

1. Encyclopedia of Disaster Management :Set in 3 volumes. Goel S.L
2. Disaster:A Psychological Essay : Wolfensterin, M.
3. People in Crisis, understanding and helping, Haff,A..
4. Management of Disaster, Social Work

## SEMESTER VI

### 6B16 BBA(Core XVI) : STRATEGIC MANAGEMENT

|                  |                                                                                                                                                                         |                        |                               |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------|
| <b>Objective</b> | The course intends to provide a theoretical frame work of strategic management and to develop an understanding about the strategic processes and their impact on a firm |                        |                               |
| <b>Pedagogy</b>  | Lectures, Assignments, Practical exercises, Seminars, etc.                                                                                                              |                        |                               |
| <b>Core XVI</b>  | 4 Credits                                                                                                                                                               | 4Teaching hrs per week | 3 Hrs. End Sem. Exam Marks 40 |

#### **Module I:**

**Evolution of Business Policy and Strategic Management:** - Nature and meaning of strategy - Strategic planning - Tactical planning - Strategic management process - Benefits and relevance of strategic management - Growing relevance of strategic management in India.

#### **Module II:**

**Strategic formulation:** Mission and Purpose - Environmental appraisal - Environmental scanning - Appraising the environment - Organizational appraisal – Tools used for organizational appraisal

#### **Module III:**

**Classification of strategies** - corporate portfolio analysis - industry, competitor and SWOT analysis

#### **Module IV:**

**Strategy Implementation** - Nature of strategy implementation - project implementation

#### **Module V:**

**Strategy evaluation and control** - strategic control - operational control - technique of strategic evaluation and control.

#### **References:**

1. Business Policy :Strategy formulation and Management Action.: William Glueck
2. Business Policy :Azhar Kasmi
3. The new Corporate Strategy : A.J. Ansoff
4. Strategic Management : Pearce and Robinson
5. Competitive Strategy : Michael E. Porter
6. Competitive Advantage: Michael E. Porter
7. Business Policy and Strategic Management : Donal F Harve y
8. Management polic y and strategic Management :R.M. Srivastava

**SEMESTER VI**  
**6B17 BBA(Core XVII) : CAPITAL MARKET AND INVESTMENT MANAGEMENT**

|                  |                                                                                           |                         |                                  |
|------------------|-------------------------------------------------------------------------------------------|-------------------------|----------------------------------|
| <b>Objective</b> | To give an overview of the conceptual aspects of Capital Market and Investment Management |                         |                                  |
| <b>Pedagogy</b>  | Lectures, Assignments, Practical exercises, Seminars, etc.                                |                         |                                  |
| <b>Core XVII</b> | 4 Credits                                                                                 | 5 Teaching hrs per week | 3 Hrs. End Sem. Exam Marks<br>40 |

**Module I:**

**Securities Market:** Primary & secondary -Structure and functioning of the Market, stock exchanges- listing ,trading and settlement procedures- NSE , BSE, Indo-next, important international stock exchanges- depositories -recent developments -stock Market indices –BSE SENSEX, Nifty and others, SEBI – Functions.

**Module II:**

**Economic , Industry & Company Analysis:** economic forecasting & investment decision -economic forecasting methods -industry analysis -classification schemes -key characteristics -industry life cycle -company analysis -financial and non financial factors -efficient Market theory

**Module III:**

**Technical Analysis:** concept -types of charts -Dow theory -price pattern -support and resistance levels -relative strength analysis -moving averages -breadth of the Market -volume -momentum -confidence index -contrary opinion theory -oscillators - stochastic-Elliot wave theory

**Module IV:**

**Investment:** Various Investments Instruments - Mutual funds - concepts & objectives - types and classification-organization &management - services provided -advantages -Indian scenario

**References:**

1. Security And Portfolio Management : Kevin
2. Security Analysis and Portfolio Management : Fischer & Jordan
3. Technical Analysis Explained.: Martin J Pring
4. Investments : Alexander, Sharpe & Bailey
5. Managing Investments : Prasanna chandra
6. Stock Exchanges & Investments : Raghunathan

**SEMESTER VI**  
**6B18BBA (Core XVIII) : INTERNATIONAL BUSINESS**

|                   |                                                                                                                                                                                                                                     |                         |                               |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------|
| <b>Objective</b>  | To enlighten the students on International Business Environment, which includes international Financial management, International Marketing and international Currency and to study the impact of globalization on Indian Industry. |                         |                               |
| <b>Pedagogy</b>   | Lectures, Assignments, Practical exercises, Seminars, Case studies etc.                                                                                                                                                             |                         |                               |
| <b>Core XVIII</b> | 3 Credits                                                                                                                                                                                                                           | 4 Teaching hrs per week | 3 Hrs. End Sem. Exam Marks 40 |

**Module I:**

**Introduction to International Business :** Globalisation and its growing importance in world economy- Impact of globalisation – International business vs. domestic business- complexities of International business- Modes of entry into international business. International Business Environment-Trends in India’s foreign trade.

**Module II:**

**Theories of international trade:** Commercial policy instruments-tariff and non-tariff measures- Balance of Payment account and its components. International organisations and arrangements ; WTO, IMF, World Bank – Regional Economic co-operations.

**Module III:**

**International Financial Environment:** Foreign exchange Markets and risk management- Foreign investment- types and flows- Financing of foreign trade and payment terms. Organisational structure for international business operations; key issues involved in making international production, finance, Marketing and human resources decisions.

**Module IV:**

**Foreign trade promotion measures and organisations in India;** SEZ and EOUs. International business negotiations- international business and outsourcing- international business and ecological consideration.

**References:**

- 1) International Business : Francis Cherunilam
- 2) International Business Environment : Sundaram and Black
- 3) International Business Environment : Bhalla and Raju
- 4) International Financial Management : P.G. Apte
- 5) International Business : Justin Paul



**SEMESTER VI**  
**6B19 BBA (Core XIX) : EVENT MANAGEMENT**

|                        |                                                                                                                                                                                                                                  |                         |                                  |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------|
| <b>Objective</b>       | 1. To enable the students to understand the essentials of planning an event<br>2. To study the concept and significance of event management<br>3. To expose students to Practical aspects of organizing events of various forms. |                         |                                  |
| <b>Pedagogy</b>        | Lectures, Assignments, Practical exercises, Seminars, etc.                                                                                                                                                                       |                         |                                  |
| <b>Core Course XIX</b> | 3 Credits                                                                                                                                                                                                                        | 4 Teaching hrs per week | 3 Hrs. End Sem. Exam Marks<br>40 |

**Module.I**

**Introduction to Event Management:** concepts – nature – scope – Evolution of professional event management- significance and components of events – starting and managing event business – event coordination.

**Module.II**

**Conceptualizing and designing Event:** key elements of events – activities in event management – planning – organizing – staffing – leading – coordination – controlling – event management information system.

**Module.III**

**Event Production** – Staging an event – choosing the event site – developing the theme – conducting rehearsals – providing services – arranging catering – interpersonal skills and public relations – necessity of human resource management and human relationships.

**Module.IV**

**Celebrity Management:** Corporate event management, Experiential Marketing, Event Marketing, Finance Management in events, Statutory requirements for events, Safety and security in event.

**Module V**

**Evaluation of Event Performance:** basic evaluation process – measuring performance – formative evaluation – objective evaluation – summative evaluation – correcting deviations – critical evaluation points. Event management industry: India / international / present – future

**Referencess**

1. Event Marketing and Management :Sanjaya Singh Gaur & Sanjaya.V.Saggere
2. Successful event management : Anton Shorie, Bryn Parry
3. Event Management : A.K.Bhatia
4. Best Practices in Modern event Management : Gold Blatt
5. Professional Event coordination : Julia Rutherford Silvers
6. Event Planning : Judy Allen
7. Hand book of conferences and meetings by David seeking

**SEMESTER VI**  
**6B20 BBA(Core XX) : MANAGEMENT ACCOUNTING**

|                       |                                                                                                                       |                         |                               |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------|
| <b>Objective</b>      | To provide the students an understanding about the managerial use of data, for planning, control and decision making. |                         |                               |
| <b>Pedagogy</b>       | Lectures, Assignments, Practical exercises, Seminars, etc.                                                            |                         |                               |
| <b>Core Course XX</b> | 4 Credits                                                                                                             | 5 Teaching hrs per week | 3 Hrs. End Sem. Exam Marks 40 |

**Module I:**

**Introduction to Management:** Meaning- Definitions, Scope and Objectives, Uses- Limitations of Financial Accounting- distinction between Financial, Cost and Management Accounting.

**Module II:**

**Analysis and interpretation of Financial Statements:** concepts, types of analysis, tools of analysis (Comparative Financial Statements, Common- size Financial Statements and Trend Analysis) Ratio Analysis – Concepts, Definition, Advantages, limitations, Types of Ratio, Solvency Ratio, Activity Ratio, Profitability Ratio(Construction of Financial Statements are not expected) Cash Flow Statement – Concept , Definitions, Uses- Concept of Working Capital- Preparation of Cash Flow Statement Only

**Module III:**

**Marginal Costing:** Concept, Definition- Features-CAP Analysis, Meaning, Importance and Limitations-UPBEAT- P/V Ratio-BEEP Chart- Margin of Safety-Managerial uses of Marginal Costing (Price fixation, Make or Buy Decisions, Key factor)

**Module IV:**

**Budgetary Control:** Concepts, Objectives, Classification- Preparation of Budgets (Cash Budget and Flexible Budget only)

**Module V:**

**Standard Costing:** Concepts ,Uses, Steps and Limitations- Variance Analysis ( Material and Labour only)

**References:**

1. Management Accounting : Sharama R.K & Sasi Guptha
2. Management Accounting : N.M Singhvi & Bodhan Wale
3. Management Accounting : RSN Pillai Bhagavathi
4. Management Accounting : S.K Guptha & R.K Sharama
5. Management Accounts : S.N Maheswari
6. Management Accounts : S.P Guptha

**SEMESTER VI**  
**6B21BBA(Core XXI) : PLACEMENT TRAINING & PROJECT REPORT**

|                        |                                                                                                                                                                                                                                                                                                                  |                           |                               |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------|
| <b>Objectives</b>      | <ol style="list-style-type: none"> <li>1. To Practically understand Research Process.</li> <li>2. To gain experience and confidence in carrying out a research</li> <li>3. To acquire the quality to collect data, analyze and interpret.</li> <li>4. To gain experience in writing research reports.</li> </ol> |                           |                               |
| <b>Pedagogy</b>        | Literature Review, Group discussion, Consultation with faculty presentations etc.                                                                                                                                                                                                                                |                           |                               |
| <b>Core course XXI</b> | 2 credits                                                                                                                                                                                                                                                                                                        | 3 teaching hours per week | 3 Hrs. End Sem. Exam Marks 40 |

**Project Report**

During the sixth semester the candidate shall do a research project in an organization for three weeks based on a relevant business/ management topic.

A maximum of four students as group can take up a topic. The students in consultation and with the consent of the assigned guide may identify a topic and do a study on the topic.

The candidates together shall prepare and submit a project report to the Department. The report shall be printed and spiral bound with not less than 50 A4 size pages. The project report should be submitted to the Head of the Department on the last working day of the sixth semester.

**Project work shall have the following stages**

- Project proposal presentation
- Field work and data analysis
- Report writing
- Draft project report presentation
- Final project report submission

The candidate shall prepare at least two copies of the report: one copy for submission to the Department and one copy for the student which he/she has to bring with him/her at the time of Viva-Voce. More copies may be prepared if necessary.

**Duration of project work**

The duration for project work is 3 weeks.

**Structure of the report:**

**Title page**

**Certificate from guide countersigned by HOD**

**Acknowledgments**

**Contents**

**Chapter I:** Introduction (Organization profile, Research problem, objectives of the study, Research methodology etc.)

**Chapter II:** Review of literature

**Chapters III:** and IV: Data Analysis ( 2 or 3 chapters)

**Chapter V:** Summary, Findings and Recommendations.

**Appendix** (Questionnaire, specimen copies of forms, other exhibits etc.)

**Bibliography** (books, journal articles etc. used for the project work).

**Evaluation of project report**

The project report shall have internal and external evaluation:

Maximum 50 Marks shall be awarded by internal panel of teachers on the basis of the draft report presentation and marks will be awarded by external examiners on the basis of performance in viva voce examination.

**I Semester BBA(CBCSS Regular)Degree  
Examination  
BBA Complementary  
1CO1BBA BUSINESS STATISTICS**

Time: 3 hrs

Max Marks:40

Section A

Answer the 4 questions . Each question carries 1/2 mark

1. Define simple correlation
2. What is histogram?
3. Define Skewness.
4. What do you mean by Irregular variation?

Section B

Answer any four questions. Each question carries 1 mark

5. Explain coefficient of variation.
6. Define Statistics as data
7. Define Tabulation and Classification
8. State the components of time series analysis.
9. How will you interpret the value of 'r' in correlation analysis?
10. What do you mean by regression coefficient?

Section C

Answer any six questions. Each question carries 3 marks

11. The Arithmetic mean of 100 items is 34. At the time of calculation three items 118, 70 and 19 were wrongly taken as 180, 17 and 90 respectively. What is the correct mean?
12. Calculate Mean Deviation from mean  
X: 33 39 58 35 43 60  
F: 8 12 15 9 5 6
13. Find the value of mode graphically

|      |   |       |       |       |       |       |
|------|---|-------|-------|-------|-------|-------|
| Size | : | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 |
| F    | : | 5     | 20    | 47    | 38    | 10    |

14. Find the missing frequencies from the following data if it is known that the median is 32.27. Total frequency is 100.

| Size  | Frequency |
|-------|-----------|
| 0-10  | 15        |
| 10-20 | 20        |
| 20-30 | 10        |
| 30-40 | x         |
| 40-50 | 13        |
| 50-60 | 10        |
| 60-70 | y         |
| 70-80 | 6         |

15. 50 students took up a test. The result of those who passed the test is given below.
- |                  |   |    |   |   |   |   |
|------------------|---|----|---|---|---|---|
| Marks:           | 4 | 5  | 6 | 7 | 8 | 9 |
| No. of students: | 8 | 10 | 9 | 6 | 4 | 3 |
16. If the average for all students was 5.16 marks, find the average mark of those who failed
17. Plot the following data on a graph paper and ascertain trend by the method semi average: Year: 2000 2001 2002 2003 2004 2005 2006
- |                     |     |     |    |     |     |     |     |
|---------------------|-----|-----|----|-----|-----|-----|-----|
| Production in tons: | 100 | 120 | 95 | 105 | 108 | 102 | 112 |
|---------------------|-----|-----|----|-----|-----|-----|-----|
18. From a group of 20 items  $\Sigma X = 1452$ ;  $\Sigma X^2 = 144280$  and mode = 63.7. Find Pearson's coefficient of skewness.

### Section

#### D

Answer any two questions. Each question carries 8 marks

19. Define measure of central tendency. What are important measures of central tendency? Explain each.
20. Fit a straight line trend from the following data by the method of least square. Also find out the value for the year 2009

| Year | Production<br>(‘000 units) |
|------|----------------------------|
| 2001 | 15                         |
| 2002 | 18                         |
| 2003 | 20                         |
| 2004 | 16                         |
| 2005 | 22                         |
| 2006 | 27                         |
| 2007 | 30                         |

21. The purchasing agents receive samples of envelopes from two suppliers. He had the samples tested in his own laboratory for testing weights with the following results.

| Testing weight | Company A | Company B |
|----------------|-----------|-----------|
| 50-60          | 3         | 10        |
| 60-70          | 42        | 16        |
| 70-80          | 22        | 36        |
| 80-90          | 3         | 8         |
|                | 70        | 70        |

Which company's envelope is more reliable ?

**I Semester BBA Degree Examination BBA Co  
mplementary Course MODEL QUESTION  
PAPER  
1C02BBA Business Economics**

**Time: 3 hrs**

**Max Marks: 40**

**Section A**

**Answer the 4 questions . Each question carries 1/2 mark**

1. Marginal costs are most closely related to-----.
2. Opportunity cost is a term which describes -----
3. The pay back period measures-----
4. Demand for electricity is elastic because-----

**Section B**

**Answer any four questions. Each question carries 1 mark**

5. Name four factors determining elasticity of demand.
6. What do you mean by equilibrium price?
7. Distinguish explicit cost and implicit cost
8. What do you mean by demand forecasting?
9. What is meant by price leadership?
10. Explain law of demand?

**Section C**

**Answer any six questions. Each question carries 3 marks**

11. Explain the different phases of business cycles
12. What is monopoly? Explain the equilibrium of a firm under monopoly.
13. Explain factors affecting pricing decision.
14. What are the features of demand forecasting
15. Explain the scope of Managerial Economics.
16. State the various exceptions to the law of demand.
17. Explain long run and short run cost
18. Explain the characteristic features of perfect competitive market.

## **Section D**

**Answer any two questions. Each question carries 8 marks**

19. Explain briefly the various objectives of pricing policy. What are the factors to be considered while designing pricing policy by firms?
20. State the various measures of controlling inflation.
21. What is demand forecasting? Explain various methods of forecasting demand for
  - 1) Established products, and 2) new products.



**I Semester BBA(CBCSS Regular)Degree  
Examination  
BBA Core Course  
MODEL QUESTION PAPER**

**1B01BBA Principles and Practice of Management**

**Time: 3 hrs**

**Max Marks:40**

**Section A**

**Answer the 4 questions . Each question carries 1/2 mark**

1. ----- is the father of scientific management
2. planning premises means-----
3. Controlling is the process of -----
4. Scientific management means-----

**Section B**

**Answer any four questions. Each question carries 1 mark**

5. What are different types of Motivation?
6. What is informal organisation?
7. Explain Line and Staff Conflict.
8. State any one feature of McGregor's Theory X.
9. What do you mean by centralisation.
10. Explain Unity of direction.

**Section C**

**Answer any six questions. Each question carries 3 marks**

11. Explain the contribution of Fayol to Management Principles
12. What are the limitations of MBO?
13. Explain the different steps in Planning.
14. Explain the techniques of controlling.
15. State the different styles of Leadership.
16. What are the factors determining the span of management?
17. Explain Line and Staff Organisation.
18. Explain the need for co-ordination.

**Section D**

**Answer any two questions. Each question carries 8 marks**

19. Define Motivation. Explain Maslow's Need Hierarchy Theory of Motivation.
20. Explain the different bases of Departmentation.
21. Explain the different types of Plans.



**II Semester BBA(CBCSS Regular)Degree  
Examination  
BBA Complementary Course  
MODEL QUESTION PAPER  
2C03BBA Quantitative Techniques for Business Decisions**

**Time: 3 hrs**

**Max Marks: 40**

**Section A**

**Answer the 4 questions . Each question carries 1/2 mark**

1. What is Classical probability refers to-----?
2. What is Type I error?
3. What is standard normal variate?
4. Define Sample point.

**Section B**

**Answer any four questions. Each question carries 1 mark**

5. Define exhaustive events
6. Write down the sample space for three unbiased coins are tossed
7. What are the axioms of probability
8. State multiplication law of probability
9. What is the probability of getting a king or spade when you are drawing a card from a pack of 52 cards?
10. Describe the utilities of poisson probability distribution.

**Section C**

**Answer any six questions. Each question carries 3 marks**

11. State and prove addition theorems of probability for non mutually exclusive events
12. Write the characteristics of normal curve
13. What is conditional probability. If  $P(A) = 0.4$ ,  $P(B) = 0.8$ ,  $P(A \text{ intersection } B) = 0.06$ , Find  $P(A/B)$  &  $P(B/A)$
14. A basket contains 20 bad & 60 good apples. Four apples are drawn from this basket. Find the probability that of four a) at least 2 are good apples, b) utmost 2 are good apples
15. A car hire firm has two cars which it hires out day by day. The number of demands for a car on each day is distributed as a poison distribution with mean 1.5. Calculate the proportion of day on which a) neither car is used, b) some demand is refused
16. The variable X follows a normal distribution with mean 45 and SD 10. Find the probability for an item to fall a) beyond 60 b) between 40 and 56.
17. In a competitive examination, 5000 students have appeared for a paper in Maths. Their average mark was 62 and SD was 12. If there are only 100 vacancies, find the minimum marks that one should secure to get selected against a vacancy.
18. What do you mean by parametric test and non parametric test?

**Section D**

**Answer any two questions. Each question carries 16 marks**

19. In a competitive examination, 5000 students have appeared for a paper in statistics. Their average mark was 62 and standard deviation was 12. If there are only 100 vacancies, find the minimum marks that one should secure to get selected against a vacancy.
20. Two groups of 100 people each were taken for testing the use of vaccine. 15 persons contracted the disease out of the inoculated persons, while 25 contracted the disease in the other group. Test the efficiency of the vaccine using chi square value.
21. The percentage of defective parts turned out by the same machine on two consecutive days is 8 and 6. If 500 parts are turned out on each of the two days, would it be justified to claim that the quantity has improved at 1% level of significance?

**II Semester BBA (CCSS Regular) Degree Examination**  
**BBA Core Course**  
**2B02 BBA BUSINESS ENVIRONMENT**

Time: 3 hrs

Max Marks: 40

Section A

Answer the 4 questions. Each question carries ½ mark

1. What is business environment
2. What do you mean by internal environment?
3. What is BCG Matrix?
4. What is PLC

Section B

Answer any four questions. Each question carries 1 marks

5. Explain customer value
6. Differentiate between customer and consumer
7. What perceptual mapping?
8. What is meant by consumer socialization?
9. What is limited problem solving
10. Explain Mission of business

Section C

Answer any six questions. Each question carries 3 marks

11. Explain the concept business environment in detail
12. Explain Business Vision, Mission and Objectives?
13. Explain Customer relationship management
14. Explain the concept stakeholders
15. What is economic environment?
16. Explain external environment of business
17. What is Cultural environment of business?
18. How culture satisfies consumer needs?

Section D

Answer any two questions. Each question carries 8 marks

19. What you mean by business environment? Explain components of business environment?
20. Define MNCs. What are the main features of MNCs? Discuss the merits of MNCs?
21. What you mean by SWOT analysis? What are the reasons for SWOT analysis?

**II Semester BBA(CBCSS Regular)Degree  
Examination  
BBA Core Course  
2B03BBA BUSINESS COMMUNICATION**

Time: 3 hrs

Max Marks:40

Section A

Answer the 4 questions . Each question carries 1/2 mark

1. What do we mean by non-verbal communication?
2. What is a memo?
3. What is an interview?
4. What is a notice?

Section B

Answer any four questions. Each question carries 1 mark

5. Define Business Communication.
6. How is a group discussion different from an interview?
7. Distinguish between listening and hearing.
8. What is an extempore?
9. Differentiate between Verb and Adverb?
10. What do Symbols?

Section C

Answer any six questions. Each question carries 3 marks

11. What is importance of communication?
12. What are the cultural barriers to communication?
13. Distinguish between Homonyms, Antonyms and Synonyms?
14. What are the basic parts of speech? Explain.
15. What is model of communication followed in business?
16. Explain the layout of a business letter
17. Explain different forms of written communication.
18. What are the steps involved in report writing?

Section D

Answer any two questions. Each question carries 8 marks

19. What do you mean by communication and what are essential of effective communication?
20. Distinguish between verbal and non verbal communication giving suitable examples?
21. What are the essential rules followed for paragraph writing?

**III Semester BBA(CBCSS Regular)Degree  
Examination  
BBA Core Course  
3B05 BBA OPERATIONS MANAGEMENT**

Time: 3 hrs

Max Marks:40

Section A

Answer the 4 questions . Each question carries 1/2 mark

1. What is motion study?
2. What is elevators?
3. What is plant layout?
4. What is PPC?

Section B

Answer any four questions. Each question carries 1 mark

5. Difference between location and site.
6. What is material handling?
7. What is work measurement?
8. What is industrial trucks?
9. What do you mean by selection of site?
10. Explain conveyors.

Section C

Answer any six questions. Each question carries 3 marks

11. What are factors affecting location selection?
12. Explain the functions of production and operations management.
13. Explain the principles of plant layout.
14. Describe the elements of production control.
15. What do you mean by work study? Explain its objectives.
16. What is work measurement? Explain work measurement techniques.
17. What is method study? Explain its procedure.
18. What are the symptoms of bad material handling?

Section D

Answer any two questions. Each question carries 8 marks

19. State the functions and objectives of material handling.
20. Explain the various types of plant layout.
21. Explain the functions of PPC.

**III Semester BBA(CCSS Regular)Degree Examination**  
**BBA Complementary**  
**3CO4BBA LEGAL ASPECTS OF BUSINESS**

Time: 3 hrs

Max Marks:40

Section A

Answer the 4 questions . Each question carries 1/2 mark

1. Who is a promoter?
2. What is an offer?
3. Define consideration?
4. What is a corporate veil? When do courts lift it?

Section B

Answer any four questions. Each question carries 1 mark

5. What is a statutory report?
6. What is statement in Lieu of Prospectus?
7. Define the term company
8. What is meant by incorporation?
9. What is underwriting?
10. Define minutes?

Section C

Answer any six questions. Each question carries 3 marks

11. State the features of a company.
12. Explain the contents of the Memorandum of Association.
13. What are the functions of Promoters?
14. What are the preliminary steps in incorporation?
15. Effects and consequences of incorporation.
16. Distinguish between a public and a private company.
17. Mention the documents to be filed with the Registrar of Companies at the time of incorporation.
18. State briefly the law relating to competence of parties to a contract.

***Section D***

Answer any two questions. **Each** carries 8 marks.

19. What are the steps in Registration/Incorporation of a company
20. Explain in detail the contents of Memorandum of Association.
21. Explain the essentials of a valid contract

**III Semester BBA (CCSS Regular) Degree Examination**  
**BBA Core Course**  
**3B04 BBA FINANCIAL ACCOUNTING**

Time: 3 hrs

Max Marks:40

Section A

Answer the 4 questions. Each question carries ½ mark

1. What do you mean by dual – aspect concept?
2. What is a compound journal entry?
3. What is a manufacturing account?
4. What do you understand by ‘profit and loss’ account?

Section B

Answer any four questions. Each question carries 1 marks

5. List 3 differences between financial accounting and management accounting
6. What you mean by financial accounting
7. What are the issues faced in financial accounting
8. What are the features of financial accounting
9. What is share capital
10. Explain the types of financial statements

Section C

Answer any six questions. Each question carries 3 marks

11. The following Trial balance has certain errors. Point out the errors and prepare the correct

Trial balance.

| Particulars            | Debit<br>Rs. | Credit<br>Rs. |
|------------------------|--------------|---------------|
| Capital account        | 1,00,000     |               |
| Furniture              |              | 10,000        |
| Deposit with Bank      |              | 75,000        |
| Interest received      |              | 10,000        |
| Miscellaneous receipts |              | 7,625         |
| Sundry creditors       | 12,500       |               |
| Sundry debtors         | 35,000       |               |
| Cash in hand           |              | 3,375         |
| House rent             | 2,500        |               |
| Office expenses        |              | 4,250         |

12. P Ltd. issued a prospectus inviting applications for 1,00,000 equity shares of Rs.10 each, payable as to Rs.2 with application, Rs.3 on allotment and the balance on first and final call. Applications were received for 80,000 shares only. All the applications were accepted in full. The call was also made in due course of time. All moneys were duly received. Journalize all the above mentioned transactions.
13. What is a special purpose subsidiary book? Give a specimen of such a book showing at least five entries
14. Distinguish between Management Accounting and Financial Accounting
15. What are the objectives of Financial accounting?



16. What are the difference between management and accounting? Support your answer with an example?
17. Explain accounting conventions in detail.
18. What is manufacturing account

Section D

Answer any two questions. Each question carries 8 marks

19. From the following prepare Trading account, Profit and Loss account and Balance Sheet as on 31<sup>st</sup> December 2009:

| Particulars                                             | Debit Balances<br>Rs. | Credit Balances<br>Rs. |
|---------------------------------------------------------|-----------------------|------------------------|
| Opening Stock                                           | 10,000                |                        |
| Cash and Bank                                           | 4,000                 | 25,000                 |
| Purchases and sales                                     | 70,000                | 90,000                 |
| Returns                                                 | 3,000                 | 4,000                  |
| Debtors and Creditors                                   | 30,000                | 21,000                 |
| Buildings                                               | 30,000                |                        |
| Capital                                                 |                       | 30,000                 |
| Furniture and Fittings                                  | 7,000                 |                        |
| Bad debts reserve                                       |                       | 2,000                  |
| Petty cash                                              | 200                   |                        |
| Carriage inwards                                        | 800                   |                        |
| Salaries                                                | 11,000                |                        |
| Interest charged by bank                                | 500                   |                        |
| Sundry trade expenses                                   | 6,000                 |                        |
| Insurance premium paid for the<br>year up to 30.06.2010 | 1,000                 |                        |
| Telephone charges                                       | 500                   |                        |
| Commission                                              |                       | 2,000                  |

Additional information

- (a) Closing stock Rs.15,000.
  - (b) Building and furniture and fittings are to be depreciated by 10% and 20% respectively.
  - (c) Bad debts Rs.1,000 are to be written off and a reserve of 5% is to be kept on remaining debtors.
  - (d) Commission received in advance Rs.1,000.
20. A company issued 20,000 preference shares of Rs.100 each, payable Rs. 25 per share on application, Rs. 25 per share on allotment and the balance in two calls of Rs 25 each. The company did not make the final call of Rs. 25 per share. All the money was duly received with the exception of the amount due on the first call on 200 shares held by Mr.Roy. The Board of Directors forfeited these shares and subsequently re-issued them, Rs.75 per share paid up, to Mr. Sen for a sum of Rs.14,000. Journalize the above transactions.
  21. What are the objectives of Financial Accounting? What the challenges faced by financial accounting of this age?

**III Semester BBA (CBCSS Regular) Degree  
Examination  
BBA Common Course  
03A 11 BBA IT IN BUSINESS**

Time: 2 hrs

Max Marks: 30

Section A

Answer all questions. Each question carries ½ mark

1. Mention any two output devices.
2. What is meant by B2C model?
3. MS Word is an example for \_\_\_\_\_ software.
4. Data organised in a meaningful fashion is called \_\_\_\_\_.

(4 x ½ = 2)

Section B

Answer any four questions. Each question carries 1 mark

5. What is data mining?
6. What is a computer network?
7. What is an information system?
8. What is encryption?
9. Write the formula for adding 10 numbers in excel that are given in the cells C5 to C14.
10. List any four methods of e-payment

(4 x 1 = 4)

Section C

Answer any four questions. Each question carries 4 marks

11. Describe any two e commerce sites
12. Explain the functions of operating system in a computer
13. Explain the role of IT in business
14. Describe any two state level e-governance initiatives
15. What is the difference between traditional commerce and e-commerce?
16. Describe any four types of computer networks.

(4 x 4 = 16)

Section D

Answer any one question. Each question carries 8 marks

17. Explain the major types of information systems prevailing in organizations
18. Describe various e-business models

(1x 8 = 8)

**III Semester BBA(CCSS Regular)Degree Examination**  
**BBA Common Course**  
**3A12 BBA: NUMERICAL SKILLS**

Time: 3 hrs

Max Marks:40

Section A

Answer the 4 questions . Each question carries 1/2 marks

1. Find the fourth proportion of 2, 3, 6
2. Which is the smallest prime number?
3. Write the sum of the roots of the equation  $x^2 - 7x + 12 = 0$
4. Define Matrix.

Section B

Answer any four questions. Each question carries 1 mark

5. What is meant by depreciation?
6. If  $A = \{1, 2, 3, 4, 5\}$   $B = \{5, 4, 2, -1\}$  Find (i)  $A \cup B$       (ii)  $A \cap B$       (iii)  $A - B$   
(iv)  $B - A$ .
7. Divide the profit Rs 6000 in the ratio 1 : 2 between Reshmi and Kiran.
8. Find the average of first 10 multiples of 7.
9. What principal will yield Rs 60 as simple interest at 6% per annum in 5 years?
10. If the cost of 7m cloth is Rs 294, find the cost of 5m cloth.

Section C

Answer any six questions. Each question carries 3 marks

11. Solve  $5x^2 + 6x + 1 = 0$  using the quadratic formula
12. A bank promises to repay after 7 years double the amount deposited in a certain amount with interest compounded annually. What is the rate of interest allowed?
13. A company studies the product preference of 20,000 consumers. It was found that each of the products A, B C was liked by 7020, 6230 and 5980 respectively and all the products were liked by 1500; products A and B were liked by 2580, products A and C were liked by 1200 and products B and C were liked by 1950. Prove that the study results are not correct
14. Prove that  $\sqrt{2}$  is irrational
15. In a class test, the sum of Shifali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and three marks less in English, the product of their marks would be 210. Find her mark in the two subjects.
16. From the following two matrices A and B find the  $A + B$ ,  $A - B$  and  $B - A$

$$\begin{bmatrix} 1 & 3 & 1 \\ 1 & 0 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 5 \\ 7 & 5 & 0 \end{bmatrix}$$

17. Find the sum of the following A. P

1, 3, 5, 7, ..... 199

18. If  $A:B = 2:3$ ,  $B:C = 4:5$  and  $C:D = 6:7$ , then find the value of  $A:B:C:D$

#### Section D

Answer any two questions. Each question carries 8 marks

19. Find the inverse of the matrix

$$\begin{bmatrix} 3 & 5 & 7 \\ 2 & -3 & 1 \\ 1 & 1 & 2 \end{bmatrix}$$

20. Find the number and sum of terms in the following Geometric Progression

6, 12, 24, .....1536.

Also find the 10<sup>th</sup> term of the progression

21. Out of 880 boys in a school, 224 played cricket, 240 played hockey and 336 played basket ball of total 64 played both basket ball and hockey. 24 played all the three games. How many boys did not play any game, and how many played only one game?

**IV Semester BBA Degree Examination**  
**BBA- Core Course**  
**4B07BBA: MARKETING MANAGEMENT**

**Time: 3 hrs**

**Max Marks:40**

**Answer all questions. Each question carries 1/2 mark**

1. Define marketing
2. What do you mean by psychological pricing?
3. What do you mean by product positioning?
4. What is hyper market?

**Answer any four questions. Each question carries 1 marks**

5. What is service marketing?
6. What is cognitive dissonance?
7. What is the difference between price penetration and skimming?
8. What do you mean by brand loyalty?
9. What is promotion mix?
10. Write short note on levels of distribution?

**Answer any six questions. Each question carries 3 marks**

11. Explain marketing mix.
12. Explain different types of brand.
13. State the purpose of sales promotion and public relation.
14. What do you mean by advertising media? Explain different types of advertising media.
15. Write short note on
  1. Premium pricing
  2. Customary pricing
16. Explain characteristics of a good salesman
17. Explain legal and ethical aspects of advertising
18. Who is a wholesaler? State different types of wholesaler.

**Answer any two questions. Each question carries 8 marks**

19. What is the difference between pricing strategy and pricing policy? Explain different types of pricing strategies.
20. What is product mix? State major product mix strategies. Explain with examples
21. Explain consumer decision making process.

**IV Semester BBA (CBCSS Regular) Degree**  
**Examination**  
**BBA Complementary Course**  
**4C05 BBA BUSINESS RESEARCH METHODS**

**Time: 3 hrs**

**Max Marks:40**

**Section A**

**Answer the 4 questions . Each question carries 1/2 mark**

1. Name the research that deals with practical problems.
2. What is the report prepared for a layman ?
3. What are questions with two alternatives referred to as ?
4. Give an example of an attitudinal scale.

**Section B**

**Answer any four questions. Each question carries 1 marks**

5. Define Theory
6. What are nominal scales?
7. What is editing?
8. Define research methodology.
9. What do you mean by sampling?
10. Explain a contingency table.

**Section C**

**Answer any six questions. Each question carries 3 marks**

11. Explain the features of Business Research.
12. What is Focus Group interview?
13. What is case study?
14. Briefly explain Exploratory research.
15. What is Observation?
16. Explain Classification of data.
17. What are the important methods of non probability sampling?
18. What are the different types of scales?

**Section D**

**Answer any two questions. Each question carries 8 marks**

19. Explain in detail the phases of business research
20. Explain the stages of Questionnaire preparation.
21. Discuss in detail the various primary and secondary sources of data

**V Semester BBA(CBCSS Regular)Degree  
Examination  
BBA Core Course  
MODEL QUESTION PAPER  
5B12BBA HUMAN RESOURCE MANAGEMENT**

**Time: 3 hrs**

**Max Marks:40**

**Section A**

**Answer the 4 questions. Each question carries 1/2 mark**

1. What are the products of job analysis?
2. State the type of training provided to new employees
3. Name any 2 forms of Workers participation in Management.
4. Mention the different types of interview.

**Section B**

**Answer any four questions. Each question carries 1 mark**

5. What do you mean by job description?
6. Define Grievance.
7. State the meaning of recruitment.
8. Mention any 2 types of minor punishments.
9. What is manpower planning?
10. State any 2 types of training.

**Section C**

**Answer any six questions. Each question carries 3 marks**

11. What are the steps in job analysis.
12. Explain internal sources of recruitment.
13. Explain the objectives of induction.
14. Examine the significance of performance appraisal.
15. State the meaning of “Red Hot Stove Rule”
16. How HRM differs from Personnel Management?
17. State the significance of Workers Participation Management
18. Explain the recent trends in HRM

**Section D**

**Answer any two questions. Each question carries 8 marks**

19. What do you mean by Selection? State the process of selection
20. What is HRM? State the functions of HRM.
21. What are the different methods of Performance Appraisal

**V Semester BBA(CBCSS Regular)Degree  
Examination  
BBA Core Course  
MODEL QUESTION PAPER  
5B14BBA ORGANISATIONAL BEHAVIOUR**

**Time: 3 hrs**

**Max Marks: 40**

**Section A**

**Answer the 4 questions . Each question carries 1/2 mark**

1. What do you mean by ego?
2. Define Organisational Behaviour.
3. State the meaning of perception.
4. Explain transformational leadership.

**Section B**

**Answer any four questions. Each question carries 1 marks**

5. What do you mean by group dynamics?
6. Explain Motivation.
7. Explain Halo Effect.
8. What do you mean by intra-group conflict?
9. State the meaning of stress
10. Define Organisational change.

**Section C**

**Answer any six questions. Each question carries 3 marks**

11. State the external factors that influence organisational change.
12. What are the different types of motivation?
13. Explain the environmental factors that influence the individual behaviour.
14. "Heredity determines the personality of an individual"-Explain
15. State any three important traits of a leader.
16. State the reasons of group formation.
17. List the main causes of organisational stress.
18. Explain the significance of Organisational Behaviour.

**Section D**

**Answer any two questions. Each question carries 8 marks**

19. Critically examine the psychoanalytical theory of personality.
20. Define Leadership. State the behavioural theories of leadership
21. What do you mean by resistance to change? State the factors of resistance to change



**V Semester BBA(CBCSS Regular)Degree  
Examination  
BBA Core Course  
5B15 BBA RETAIL MANAGEMENT**

**Time: 3 hrs**

**Max Marks: 40**

**Section A**

**Answer the 4 questions . Each question carries 1/2 mark**

1. From where did the word “retail” originate ?
2. What goods are sold in only selected franchised outlets.
3. What is online pricing?
4. What do you mean by the interior retail stores arrangement of department or grouping of merchandise.

**Section B**

**Answer any four questions. Each question carries 1 marks**

5. Define retailing.
6. What are specialty stores?
7. What is a hyper market?
8. What is labeling?
9. Mention a few types of store based retailing.
10. What is vertical marketing system?

**Section C**

**Answer any six questions. Each question carries 3 marks**

11. Explain Retail Promotion mix.
12. What are retail pricing objectives?
13. What are the activities performed by retailers?
14. Briefly explain merchandise forecasting.
15. What is intensive distribution ?
16. Explain the wheel of retailing.
17. What is meant by Trading Area ?
18. What is Retail Life Cycle ?

**Section D**

**Answer any two questions. Each question carries 8 marks**

19. What do you mean by retailing? Explain the various types of retailing.
- 20 Explain the different types of retail location.
21. Explain the various components of retail promotion strategy.

**VI Semester BBA(CBCSS Regular)Degree  
Examination  
BBA Core Course  
6B16 BBA STRATEGIC MANAGEMENT**

**Time: 3 hrs**

**Max Marks: 40**

**Section A**

**Answer the 4 questions . Each question carries 1/2 mark**

1. ----- are partnerships between firms in the same industry?
2. ----- is the advantage created through the characteristics of a person's network
3. ----- is the collection of ties between people and the strength of those ties
4. ----- is a declaration of what a firm is and what it stands for.

**Section B**

**Answer any four questions. Each question carries 1 marks**

5. What is a firm's value chain?.
6. What do you mean by Industry analysis?
7. What does 'Threat of entry' signify?
8. Explain the value curve?
9. What do you mean by competition analysis?.
10. What is new-market-creation strategy?

**Section C**

**Answer any six questions. Each question carries 3 marks**

11. Explain the five forces model.
12. What are the various types of acquisitions?
13. What is an acquisition premium?
14. What is strategy implementation?.
15. What is intensive distribution ?
16. How does globalization affect organization structure?.
17. What do you mean by competitive advantage?
18. Explain the product life cycle?

**Section D**

**Answer any two questions. Each question carries 8 marks**

19. What are the various methods adopted by companies for going global?.
- 20 Explain the Five forces model with examples.
21. What must organizations do to prepare for an IPO?

**VI Semester BBA(CCSS Regular)Degree Examination**  
**BBA Core Course**  
**6B18 BBA INTERNATIONAL BUSINESS**

**Time: 3 hrs**

**Max Marks: 40**

**Section A**

**Answer the 4 questions . Each question carries 1/2 mark**

1. In the ----- approach, overseas operations are viewed as secondary to domestic operations.
2. ----- is the trade exclusively between two countries
3. WTO came into existence in -----
4. The EU was formed in the year-----.

**Section B**

**Answer any four questions. Each question carries 1 marks**

5. What are bilateral trade agreements?.
6. Define TRIPS.
7. Define tariffs?
8. Expand SAFTA.
9. What do you mean by bill of lading?.
- 10 Define Forex market.

**Section C**

**Answer any six questions. Each question carries 3 marks**

11. Explain the nature of International Business.
12. What are the advantages and disadvantage of International trade?
13. State the importance of globalization?
14. What are the basic principles of WTO?.
15. Explain SEZ.
16. How does globalization affect organization structure?.
17. What are the functions and role of WTO?
18. What are the main objectives of FEMA?

**Section D**

**Answer any two questions. Each question carries 8 marks**

19. Discuss the importance and limitations of International Business.
- 20 Discuss the impact of globalization on the Indian Economy.
21. Discuss the functions and role of WTO.

## **IV Semester BBA Degree Examination**

### **BBA Core Course**

#### **MODEL QUESTION PAPER**

### **4B09 BBA Financial Management**

**Time: 3 hrs**

**Max Marks: 40**

#### **Section A**

**Answer the 4 questions . Each question carries 1/2 mark**

1. Financial Planning is the first step of-----.
2. Cost of capital is known as shareholders' -----
3. The difference between the total assets and the total outside liabilities of a firm is known as-----
4. The return on debenture is-----

#### **Section B**

**Answer any four questions. Each question carries 1 mark**

5. Define Working Capital Management.
6. What is profit maximisation?
7. What do you mean by Sundry Debtors?
8. What is trading on equity?
9. Explain EBIT.
10. What do you understand by a declining firm?

#### **Section C**

**Answer any six questions. Each question carries 3 marks**

11. What are the functions of Financial Management?
12. What are the short term objectives of Financial Management?
13. What is cost of capital?
14. What is cost of equity capital?
15. Explain EBIT/EPS Analysis
16. What is wealth maximization of business?
17. What are the changing role of Financial Management
18. What is WACC

#### **Section D**

**Answer any two questions. Each question carries 8 marks**

19. . X Ltd. Issues 50,000 8% debentures of Rs. 10 each at a premium of 10%. The cost of floatation is 2%. The rate of tax applicable is 60%. Compute cost of debt capital.
20. . Explain the functions of Financial Management

21. “The basic rationale for the objective of wealth maximization is that it reflects the most efficient use of society’s economic resources and thus leads to a maximization of society’s economic wealth”. (Ezra Solomon). Comment critically.

**IV Semester BBA (CCSS Regular) Degree Examination**

**BBA Common Course**

**4A13COM/BBA ENTREPRENEURSHIP & PROJECT MANAGEMENT**

Time: 3 hrs

Max Marks: 40

**Section A**

Answer all questions. Each question carries ½ mark

1. ----- is the probability and magnitude of downside loss.
2. The description of the future direction of the business is known as-----
3. ----- involves the ability to rapidly sense, act and mobilize, even under uncertain conditions.
4. ----- is the stages each product goes through from introduction to decline

**Section B**

Answer any four questions. Each question carries 1 mark

5. Define Entrepreneurship?
6. What do you mean by project management?
7. What is flexibility study?
8. What do you mean by intrapreneurs?
9. What do you mean by small scale industry?.
10. What do you mean by viability study?

**Section C**

Answer any six questions. Each question carries 3 marks

11. Write a note on Women Entrepreneurs.
12. Explain the functions of Entrepreneurs
13. Distinguish between Entrepreneurs and managers
14. Describe any two state level financing institutions.
15. What is the difference between Intrapreneurs and entrepreneurs?
16. Describe any four types of Entrepreneurs.
17. Write a note on rural entrepreneurship
18. Explain EDP.

**Section D**

Answer any two questions. Each question carries 8 marks

19. Explain status of entrepreneurship in Indian industry with examples
20. Describe various stages of project management.
21. Explain women entrepreneurship in India

## IV Semester BBA Degree Examination

### BBA Core Course

#### MODEL QUESTION PAPER

### 4B08 BBA Corporate Accounting

Time: 3 hrs

Max Marks: 40

#### Section A

Answer the 4 questions . Each question carries 1/2 mark

1. The company's Balance Sheet must be prepared according to the prescribed form given in ----- of the Companies Act.
2. Amount set aside to meet some known liability of which the amount is uncertain is --  
----
3. Liability which is not actual but it will become actual on the happening of some event which is uncertain is -----
4. The purchase consideration based on the Lump Sum Method is a ----- amount.

#### Section B

Answer any four questions. Each question carries 1 mark

5. What is divisible profits?
6. What is calls in arrear?
7. What is preliminary expenses?
8. What is business purchase account?
9. What is Vendors suspense account?
10. What is amalgamation?

#### Section C

Answer any six questions. Each question carries 3 marks

11. Explain the various methods of calculating Purchase Consideration.
12. Write short notes on contingent liabilities, Bonus shares, Arrears of depreciation, Miscellaneous expenditure, Managerial remuneration and Financial year.
13. What is profit prior to incorporation? How is profit prior to incorporation ascertained?
14. A Ltd. was incorporated on the 30<sup>th</sup> April to take over a private business as from 1<sup>st</sup> January. The company closed its accounts on 31<sup>st</sup> December when the gross profit for the whole year was found to be Rs.84,000. The sales for January, April and October were one and a half times the average for the year, while those for December were twice the average and those for March only half the average. Estimate the gross profit earned prior to incorporation.
15. A company was incorporated on April 1, 1993 to take over a running business as from January 1, 1993. The accounts drawn up for the year ending December 31, 1993 showed wages as Rs.48,000. The number of workers in the post-incorporation period was 250 as against 50 in the pre-incorporation period. Allocate the wages between pre and post incorporation periods.
16. A limited company acquired the business of Messers Green & Co. with the exception of book debts and trade liabilities. The company however, agreed to collect the book debts and pay off the trade liabilities on behalf of the vendors. The debtors

amounted to Rs.80000 and creditors to Rs.60000. All the sums due from debtors were collected except Rs.1500 bad debts and Rs.2000 allowed for cash discount. The creditors were paid Rs.57000 in full settlement. The company's commission was agreed at 2% on amount collected and 1% on payments made. Show the journal entries and ledger accounts assuming that the amount due to vendors was paid off. Ignore interest.

17. What are the objectives of amalgamation?
18. What are the main features of external reconstruction?

### Section D

**Answer any two questions. Each question carries 8 marks**

19. A Ltd. and B Ltd. agree to amalgamate as from December 31, 2009 on which date their respective Balance Sheets, after revaluation were as follows:

#### BALANCE SHEET OF A LTD.

| Liabilities               |               | Assets     |               |
|---------------------------|---------------|------------|---------------|
| Share Capital             | 20,000        | Machinery  | 10,000        |
| 2000 shares of Rs.10 each |               |            |               |
| Reserve Fund              | 6,000         | Book Debts | 13,000        |
| P & L Account             | 4,000         | Stock      | 6,500         |
| Sundry Creditors          | 4,000         | Cash       | 4,500         |
| <b>Total</b>              | <b>34,000</b> |            | <b>34,000</b> |

#### BALANCE SHEET OF B LTD.

| Liabilities                 |        | Assets     |        |
|-----------------------------|--------|------------|--------|
| Share Capital               | 40,000 | Machinery  | 23,000 |
| 4,000 shares of Rs. 10 each |        |            |        |
| P and L account             | 10,000 | Book Debts | 10,000 |



|                  |        |       |        |
|------------------|--------|-------|--------|
| Sundry Creditors | 3,000  | Stock | 19,500 |
|                  |        | Cash  | 500    |
| Total            | 53,000 |       | 53,000 |

You are required –

1. To state the best way of carrying out the amalgamation;
2. To state what proportion of shares in the new company the shareholders of the old companies will respectively receive;
3. To show how the shares of the new company will be distributed to the shareholders of the old companies; and
4. To prepare the Balance Sheet of the new company

20. A and B partners, decided to sell their business to X Ltd. Their balance sheet on the date of sale was as follows:

|              |       |                   |       |
|--------------|-------|-------------------|-------|
| A's Capital  | 25000 | Freehold Premises | 26000 |
| B's Capital  | 25000 | Investments       | 18000 |
| Tr creditors | 16000 | Book debts        | 17000 |
| B.Overdraft  | 10000 | Stock             | 10000 |
|              |       | Cash              | 5000  |

The partners agreed to collect their book debts and pay off the liabilities to trade creditors. The company took over the remaining assets subject to the revaluation of freehold premises at Rs.25000, Investments at Rs.15000, Stock at Rs.12500 and Goodwill at Rs.7500. X Ltd also agreed to discharge the Bank overdraft and meet the expenses of dissolution (Rs.2500) of the firm.

The purchase consideration was to be satisfied as to Rs.50000 in shares of Rs.10 each at a market price of Rs.12.50 per share and the balance in cash.

Calculate the purchase consideration and show the journal entries in the company's books.

21. Ahamed and Balan carrying on business in partnership wished to dissolve the firm and sell the business to a limited company on December 31<sup>st</sup>, 2011 when the firm's position was as under:

BALANCE SHEET, DEC, 31,2011

|             |        |              |        |
|-------------|--------|--------------|--------|
| Creditors   | 42500  | Cash at bank | 10200  |
| Ahamed cap. | 68000  | Debtors      | 96900  |
| Balan cap.  | 34000  | Stock        | 30760  |
|             |        | Furniture    | 6640   |
|             | 144500 |              | 144500 |

- The company was formed with an authorised capital of Rs.600000 divided into 3500 equity shares of Rs.100 each and 2500, 6% preference shares of Rs.100 each. The terms of business purchase provided---

A, that furniture and stock will be taken over by the company at balance sheet values less 10%

B, that the goodwill of the firm is worth Rs.20240

C, that the firm's debtors, cash and creditors were not to be taken over by the company, but that the company was to undertake to collect the book debts and discharge the liabilities of the vendors, as agent, for which service the company was to be paid 3% on all collections from the vendors debtors and 2% on all payments made to vendor's creditors. The commission so earned was to be utilised by the company in writing off goodwill.

D, that the purchase price be paid in fully paid equity and 10% preference shares in the proportion of 3:2 at a premium of 10 per share.

The company received during the first one month after the purchase of business Rs.73000 from vendor's debtors including Rs. 7000 from a person whose account was written off as bad in the firm's books. Out of the money so received the company paid Rs.42000 in full settlement of vendor's liabilities.

The remainder of the equity and preference shares were issued to the public at a premium of Rs.10 per share, which were all taken up and fully paid on allotment.

Show journal entries to record the above transactions in the books of the company and give the balance sheet as at January 31<sup>st</sup> , 1994, assuming that no other transactions took place in the meantime.

## **v Semester BBA Degree Examination**

### **BBA Core Course**

#### **MODEL QUESTION PAPER**

#### **5B13 BBA Banking Theory and Practice**

**Time: 3 hrs**

**Max Marks: 40**

#### **Section A**

**Answer the 4 questions . Each question carries 1/2 mark**

1. The present Reserve Bank Governor is-----
2. NPA is expanded as -----
3. The nationalisation of banks in India took place in the year-----
4. The Central Bank of India is -----

#### **Section B**

**Answer any four questions. Each question carries 1 mark**

5. What is currency?
6. What is new generation banking?
7. What is NBFC?
8. What is bank credit?
9. What is a commercial bank?
10. What is CRR?

#### **Section C**

**Answer any six questions. Each question carries 3 marks**

11. Specify the importance of banking theory in the present scenario
12. What is banking concept of education
13. Needs of banking theory
14. What is islamic banking theory and practice
15. What are the objectives of banking theory and practices
16. Modern banking
17. Define the term banking
18. What are the different types of Banks

#### **Section D**

**Answer any two questions. Each question carries 8 marks**

19. What are the recent trends in banking?
20. Write a note on currency system in India and the role played by RBI in the Indian currency system.
21. Write about the developments in the banking sector since 1991.

## V Semester BBA (CCSS Regular) Degree Examination

### BBA Core Course

#### 5B11 BBA Cost Accounting

Time: 3 hrs

Max Marks: 40

#### Section A

Answer all questions. Each question carries ½ mark

1. ----- is the process of charging the full amount of an individual item of cost directly to a cost centre for which this item of cost was incurred.
2. FIFO method of stock valuation is useful when.....
3. Contract costing is used for-----
4. ----- is cost are partly fixed and partly variable.

#### Section B

Answer any Four questions. Each question carries 1 mark

5. What is Inventory control?
6. What do you mean by work certified?
7. What is Escalation Clause in Contract Accounts?
8. What do you mean by Batch costing?
9. Define Idle Time?
10. Two components, A and B are used as follows.  
Usage: Maximum. 75 per week each, Minimum 25 per week each, Normal. 50 per week each. Reorder quantity: A: 300, B: 500. Reorder period: A: 4 to 6 weeks, B: 2 to 4 weeks.  
Required: Calculate for each component a. Re ordering level b. Minimum level c. Maximum level d. Average Stock Level.

#### Section C

Answer any Six questions. Each question carries 3 marks

11. Calculate the earnings of workers X and Y under Straight piece rate system and Taylers Differential piece rate system from the following information.  
Normal rate per hour= Rs.3.60  
Standard time per unit = 20 seconds  
Differential to be applied: Below standard – 80%: At or above standard – 120 %  
Worker X produces 2600 units per day. While worker Y produces 3000 units per day.
12. The following annual charges are incurred in respect of a machine in a shop where manual labour is almost nil and where work is done by means of five machines exactly of similar type and specification:  
Rent and Rates (proportional to the floor space occupied) for the shop Rs. 4,800

|                                                                                                           |      |
|-----------------------------------------------------------------------------------------------------------|------|
| Depreciation on each machine                                                                              | 500  |
| Repairs and Maintenance for the five machines                                                             | 1000 |
| Power consumed (as per meter) @ 5p. per unit for the shop                                                 | 3000 |
| Electric charges for light in the shop                                                                    | 540  |
| Attendants: There are two attendants for the five machines and they are each paid Rs. 60 per month.       |      |
| Super vision : For the five machines in the shop there is one supervisor whose emoluments are Rs. 250 p.m |      |
| Sundry supplies such as Lubricants, Jute and Cotton Waste etc, for the shop                               | 450  |
| Hire purchase instalments payable for the machine ( including Rs.300 as interest)                         | 1200 |

The Machine uses 10 units of power per hour. Calculate the machine hour rate for the machine for the year.

13. From the following information, prepare a statement showing cost and profit per unit:

|                                  |                                                    |
|----------------------------------|----------------------------------------------------|
| Direct materials                 | Rs. 45,000                                         |
| Direct labour                    | 33-1/3%                                            |
| Direct expenses                  | 20% of direct material cost and direct labour cost |
| Factory overheads                | 1/9 <sup>th</sup> of prime cost.                   |
| Office & Administrative Expenses | 25% of works cost.                                 |
| Selling and Distribution OHs     | 10% of cost of goods sold                          |
| Units produced                   | 100                                                |
| Units remain unsold              | 10% of units produced.                             |
| Profit                           | 1/6 <sup>th</sup> of sales.                        |

14. A building contractor gives the following information and ask you to prepare Contract

Account:

|                |            |
|----------------|------------|
| Plant          | Rs. 30,000 |
| Materials      | 75,000     |
| Wages          | 45,000     |
| Expenses       | 15000      |
| Contract Price | 3,00,000   |
| Certified work | : 1,35,000 |

Cash received 75% of work certified

At the end of the year- work not certified Rs. 12,000. Materials at site Rs. 3,000, Depreciation on plant 10%.

15. What are the various classifications of costs?

16. Explain the difference between cost accounting and financial accounting.

17. What do you mean by cost sheet. Give a structure of cost sheet.

18. Explain the various methods of costing.

## Section D

Answer any Two questions. Each question carries 8 marks

19 . From the following information, prepare a statement showing cost and profit per unit:

|                                  |                                                    |
|----------------------------------|----------------------------------------------------|
| Direct materials                 | Rs. 45,000                                         |
| Direct labour                    | 33-1/3%                                            |
| Direct expenses                  | 20% of direct material cost and direct labour cost |
| Factory overheads                | 1/9 <sup>th</sup> of prime cost.                   |
| Office & Administrative Expenses | 25% of works cost.                                 |
| Selling and Distribution OHs     | 10% of cost of goods sold                          |
| Units produced                   | 100                                                |
| Units remain unsold              | 10% of units produced.                             |
| Profit                           | 1/6 <sup>th</sup> of sales.                        |

20. X ltd furnishes the following stores transactions for july, 2011.

|                                   |                             |
|-----------------------------------|-----------------------------|
| 1. Opening balance                | 200 Units value Rs. 2,000   |
| 4. Receipts from B&Co GRN No.11   | 300 Units @ Rs.12 per unit  |
| 7. Issues Req. No.101             | 400 units                   |
| 10. Receipts from M&Co. GRN No.12 | 400 units @ Rs.14 per unit. |
| 19 Issues Req. No. 102            | 300 Units                   |
| 22 Receipts from N Co. GRN No.13  | 200 Units @ Rs.16 per unit  |
| 28 Issues Req. No. 103            | 300 Units                   |
| 30 Shortage in stock taking       | 20 units.                   |

Prepare the Stores Ledger using Simple Average method.

21 What do you mean by contract Account? What are the rules with regard to accounting for profit on incomplete contracts?

## VI Semester BBA (CCSS Regular) Degree Examination

### BBA Core Course

#### 6B17 BBA Capital Market & Investment Management

Time: 3 hrs

Max Marks: 40

#### Section A

Answer all questions. Each question carries ½ mark

1. Under ----- the broker is instructed by the investor to buy or sell a stated number of shares immediately at the best prevailing price in the market.
2. ----- is a trader who applies for shares in the new issues market just like a genius investor
3. The base year for BSE SENSEX is -----
4. ----- instruments enable collateralized short term borrowing through the selling of debt instruments.

#### Section B

Answer any four questions. Each question carries 1 mark

5. What is financial market?
6. What is meant by New Issue market?
7. What is book building?
8. What is stock exchange?
9. Write a short note on NSE?
10. What is stop order?

#### Section C

Answer any Six questions. Each question carries 3 marks

11. Write a note on various speculators in the market?
12. What do you mean by Fundamental and Technical analysis?
13. Write a note on listing and delisting?
14. Describe the current status of stock exchanges in the country?
15. Explain the steps involved in a book building process.
16. What is screen-based trading?. How is it different from floor trading?
17. What is a new issue market? What are its functions?
18. Write a note on Money market

#### Section D

Answer any Two questions. Each question carries 8 marks

19. Discuss the various methods of Floating New Issues in the Capital Market.
20. Discuss the role of SEBI in the secondary market? How do they protect the investors in the new issue market.
21. Differentiate between capital and money market securities. Explain the commonly available money market securities.



## VI Semester BBA (CCSS Regular) Degree Examination

### BBA Core Course

#### 6B20 BBA Management Accounting

Time: 3 hrs

Max Marks: 40

#### Section A

Answer all questions. Each question carries ½ mark

1. Comparative statements are a form of -----.
2. Solvency ratio indicates-----
3. Financial statements provides a summary of-----.
4. Retained earning statement depicts -----

#### Section B

Answer any four questions. Each question carries 1 mark

5. Define Management Accounting.
6. How is current ratio calculated?
7. What is EPS?
8. What is common size statements?
9. What is significance of P/E ratio.
10. What is window dressing?

#### Section C

Answer any four questions. Each question carries 4 marks

11. "Management Accounting is concerned with accounting information which is useful to management". Comment.
12. What are the managerial uses of ratio analysis?
13. Explain the terms budgets and budgetary control.
14. The Income statements of a concern are given for the year ending on 31<sup>st</sup> Dec. 2010 and 2011. Re-arrange the figures in a comparative form and study the profitability position of the concern.

|                                     | 2010 (Rs 000) | 2011 (Rs 000) |
|-------------------------------------|---------------|---------------|
| Net Sales                           | 785           | 900           |
| Cost of goods sold                  | 450           | 500           |
| <i>Operating Expenses</i>           |               |               |
| General and administrative expenses | 70            | 72            |
| Selling Expenses                    | 80            | 90            |
| <i>Non-operating Expenses</i>       |               |               |
| Interest paid                       | 25            | 30            |
| Income Tax                          | 70            | 80            |

15. From the following information, ascertain the operating profit ratio

|                         |              |
|-------------------------|--------------|
| Sales less returns      | Rs. 8,00,000 |
| Cost of goods sold      | 5,60,000     |
| Administrative expenses | 50,000       |
| Selling Expenses        | 30,000       |
| Interest                | 40,000       |
| Profit on sale of plant | 15,000       |
| Provision for taxation  | 20,000       |

16. Calculate the cash from Operations from the following P&L A/c

| Particulars                      | Rs       | Particulars               | Rs       |
|----------------------------------|----------|---------------------------|----------|
| To Salaries                      | 30,000   | By Gross Profit           | 1,40,000 |
| To Rent                          | 25,000   | By Profit on sale of Land | 15,000   |
| To Depreciation                  | 7,000    | By income tax refund      | 10,000   |
| To loss on sale of land          | 10,000   |                           |          |
| To Preliminary expenses<br>W.off | 5,000    |                           |          |
| To proposed Dividend             | 20,000   |                           |          |
| To provision for taxation        | 15,000   |                           |          |
| To Net Profit                    | 53,000   |                           |          |
|                                  | 1,65,000 |                           | 1,65,000 |

17. Compute G/P ratio from the following

|                  |          |
|------------------|----------|
| Sales            | 5,12,000 |
| Sales returns    | 10,000   |
| Opening Stock    | 82,000   |
| Closing stock    | 64,400   |
| Purchase         | 3,92,000 |
| Purchase returns | 8,000    |

|                                            |          |
|--------------------------------------------|----------|
| 18. Issued and Subscribed Capital          | 2,00,000 |
| 2,000 equity shares of Rs.10 each          | 1,00,000 |
| 1,000 8% preference shares of Rs. 100 each | 3,00,000 |
| Reserves and Surplus                       | 30,000   |
| Capital Reserve                            | 50,000   |
| Reserve for contingencies                  | 20,000   |
| Net Profit before Interest and tax         | 1,50,000 |
| Interest charges                           | 30,000   |
| Tax Rate                                   | 50%      |

Calculate return on shareholders' investment.

(4 x 4 = 16)

#### Section D

Answer any two questions. Each question carries 8 marks

19. Following is the profit and loss Account to Max Webel Ltd, for the year ended 31<sup>st</sup> December, 2010

|                  |          |                  |          |
|------------------|----------|------------------|----------|
| To Opening Stock | 2,00,000 | By Sales         |          |
| 5,60,000         |          |                  |          |
| To Purchases     | 3,50,000 | By Closing stock | 1,00,000 |

|                          |                 |                      |                 |
|--------------------------|-----------------|----------------------|-----------------|
| To Wages                 | 9,000           |                      |                 |
| To G/P c/d               | 2,01,000        |                      |                 |
|                          | <b>7,60,000</b> |                      | <b>7,60,000</b> |
| To Admini. Expenses      | 20,000          | By Gross Profit b/d  | 2,01,000        |
| To Selling & Distr. Exp. | 89,000          | By Interest on       |                 |
| Investments              |                 | (outside business)   | 10,000          |
| To Non- operating Exp.   | 30,000          | By profit on Sale of |                 |
| Investments              | 8,000           |                      |                 |
| To Net profit            | 80,000          |                      |                 |
|                          | <b>3,19,000</b> |                      | <b>3,19,000</b> |

You are required to calculate:

Gross Profit Ratio Net

Profit Ratio Operating

Ratio Operating Profit

Ratio

Administrative Expenses Ratio.

20. Following are the Income statements of a company for the years ending Dec, 31, 2010.& 2011. Present the data in such a way that proper analysis is possible ( common size Income statement)

|                      | 2010 (Rs. 000) | 2011 (Rs.000) |
|----------------------|----------------|---------------|
| Sales                | 600            | 800           |
| Miscellaneous Income | 20             | 15            |
|                      | <b>520</b>     | <b>715</b>    |
| Expenses             |                |               |
| Cost of Sales        | 325            | 510           |
| Office expenses      | 20             | 25            |
| Selling expenses     | 30             | 45            |
| Interest             | 25             | 30            |
| Net profit           | 120            | 105           |
|                      | <b>520</b>     | <b>715</b>    |

21. What do you mean by analysis and interpretation of financial statements? State the different types and tools of financial analysis.

## **VI Semester BBA (CCSS Regular) Degree Examination**

### **BBA Core Course**

#### **6B19 BBA Event Management**

Time: 3 hrs

Max Marks: 40

#### Section A

Answer all questions. Each question carries ½ mark

1. Celebrity events are known as-----
2. Event management means-----
3. Event management refers to-----.
4. -----is the quality of the best event manager

#### Section B

Answer any four questions. Each question carries 1 mark

5. What do you mean by events?
6. What do you mean by event management?
7. Expand MICE
8. What are special effect lights?
9. What do you mean by Event marketing process?
10. What do you mean by event description?

#### Section C

Answer any six questions. Each question carries 3 marks

11. Discuss the process of event management.
12. Narrate the history of meetings and events
13. Discuss the role of convention and visitor Bureaus.
14. Explain about the type of host facilities.
15. Explain the economic impacts of events.
16. What are the diverse marketing needs addressed by events
17. Discuss the onsite and post meeting activities
18. Discuss the traditional and modern technology applications of events

#### Section D

Answer any one question. Each question carries 8 marks

19. What are the ten commandments of event management. Explain
20. Evaluate the relationship between event management and tourism
21. What do you mean by Event Proposal? How do you prepare an event proposal.



**KANNUR UNIVERSITY**  
**(Abstract)**

*BCA- Revised Scheme & Syllabus of Core and Open Courses under Choice Based Credit Semester System for Under Graduate Programme - implemented with effect from 2014 admission - Orders Issued.*

**ACADEMIC BRANCH**

**No. Acad/C2/7857/2014 (II)**

**Dated, Civil Station P.O, 04 - 07-2014**

Read: 1.U.O No. Acad/C2/2232/2014 dated 14-03-2014

2. Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 27-01-2014
3. Minutes of the meeting of the Faculty of Technology held 01-04-2014
4. Letter dated 24.06.2014 from the Chairman, BOS in Computer Science (UG)

**ORDER**

1. The Revised Regulations for UG Programme under Choice based Credit & Semester System were implemented in this University with effect from 2014 admission as per paper read (1) above.
2. As per paper read (2) above the Board of Studies in Computer Science(UG) finalized the Scheme, Syllabus & model Question Papers for Core & open courses of BCA programme to be implemented with effect from 2014 admission..
3. As per read (3) above the Faculty of Technology (UG) held on 01.04.2014 approved Scheme, syllabus & model question papers for core & open courses of BCA programme to be implemented with effect from 2014 admission.
4. The Chairman, Board of Studies in Computer Science (UG) vide paper read (4) above has submitted the finalized copy of Scheme, syllabus & Model question papers for core and open courses of BCA programme for implementation with effect from 2014 admission.
5. The Vice Chancellor, after examining the matter in detail, and in exercise of the powers of the Academic Council as per section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised scheme, syllabus& model question papers of BCA Programme with effect from 2014 admission.
6. Orders, are therefore issued implementing the revised scheme, syllabus & model question papers for core & open courses of BCA programme under CBCSS with effect from 2014 admission subject to report to Academic Council
7. Implemented revised Syllabus is appended.

**Sd/-**  
**REGISTRAR**

To

1. The Principals of Affiliated Colleges offering BCA Programme
2. The Examination Branch (through PA to CE)

Copy To:

1. The Chairman, BOS Computer Science (UG)
2. PS to VC/PA to PVC/PA to Registrar
3. DR/AR I Academic
4. Central Library
5. SF/DF/FC.

Forwarded/By Order



Section Officer



❖ For more details log on to [www.kannur\\_university.ac.in](http://www.kannur_university.ac.in)

*Handwritten initials*

# **KANNUR UNIVERSITY**



**COURSE STRUCTURE AND SYLLABUS**

**for**

**UNDERGRADUATE PROGRAMME**

**In**

**COMPUTER APPLICATION**

**CORE & OPEN COURSES**

**Under**

**CHOICE BASED CREDIT AND SEMESTER SYSTEM**

**w. e. f. 2014 ADMISSION**





## **General Guidelines, Curricula, Syllabus and Scheme of examinations for BCA Programme w.e.f 2014 admission onwards**

BCA, an undergraduate programme under the Faculty of Technology of Kannur University, consists of Computer Application as core subject with one complementary subject (Mathematics). The duration of the programme is six semesters distributed over a period of three years. A semester consists of 90 working days including examination days distributed over a minimum of 18 weeks of five working days each.

### **COURSES**

The number of courses required to complete the programme shall be 40. 'Course' means a segment of subject matter to be covered in a semester (traditionally referred to as paper). The courses include Common Courses including General Course, Complementary Course, Core Course and Open Course. The break-up of the courses is as follows:

| <b>Course Type</b>                             | <b>Total Numbers</b> |
|------------------------------------------------|----------------------|
| Common courses (English + Additional language) | 06                   |
| Common courses (General)                       | 04                   |
| Complementary                                  | 04                   |
| Core                                           | 25                   |
| Open Course                                    | 01                   |
| <b>Total</b>                                   | <b>40</b>            |

## BCA - Course Structure

### Semester –I

| No. | Title of the Course                                  | Hours/Week |           | Credit    | Marks      |
|-----|------------------------------------------------------|------------|-----------|-----------|------------|
|     |                                                      | Theory     | Practical |           |            |
| 1   | Common course English I                              | 5          |           | 4         | 50         |
| 2   | Common course English II                             | 4          |           | 3         | 50         |
| 3   | Common course Additional Language I                  | 5          |           | 4         | 50         |
| 4   | Complementary I - Mathematics I                      | 4          |           | 3         | 50         |
| 5   | Common course - Informatics for Computer Application | 3          |           | 4         | 50         |
| 6   | Core course 1 - Programming in C                     | 2          | 2         | 2         | 50         |
|     | <b>Total</b>                                         | <b>23</b>  | <b>2</b>  | <b>20</b> | <b>300</b> |

### Semester –II

| No. | Title of the Course                                 | Hours/Week |           | Credit    | Marks      |
|-----|-----------------------------------------------------|------------|-----------|-----------|------------|
|     |                                                     | Theory     | Practical |           |            |
| 1   | Common course English III                           | 5          |           | 4         | 50         |
| 2   | Common course English IV                            | 4          |           | 3         | 50         |
| 3   | Common course Additional Language II                | 5          |           | 4         | 50         |
| 4   | Complementary II - Mathematics II                   | 4          |           | 3         | 50         |
| 5   | Core course 2 -Digital Systems                      | 3          |           | 2         | 50         |
| 6   | Core course 3–Object Oriented Programming Using C++ | 2          |           | 3         | 50         |
| 7   | Core course 4 -Lab – I (Programming in C)           |            |           | 2         | 25         |
| 8   | Core course 5 -Lab –II (Programming in C++)         |            | 2         | 2         | 25         |
|     | <b>Total</b>                                        | <b>23</b>  | <b>2</b>  | <b>23</b> | <b>350</b> |

### Semester –III

| No. | Title of the Course                            | Hours/Week |           | Credit    | Marks      |
|-----|------------------------------------------------|------------|-----------|-----------|------------|
|     |                                                | Theor<br>y | Practical |           |            |
| 1   | Common course – Data Structure                 | 4          | 3         | 4         | 50         |
| 2   | Common course – Data Base Management System    | 4          | 2         | 4         | 50         |
| 3   | Complementary III - Mathematics III            | 4          |           | 3         | 50         |
| 4   | Core course 6 -Computer Organization           | 4          |           | 3         | 50         |
| 5   | Core course 7 -Introduction to Microprocessors | 4          |           | 3         | 50         |
|     | <b>Total</b>                                   | <b>20</b>  | <b>5</b>  | <b>17</b> | <b>250</b> |

### Semester –IV

| No. | Title of the Course                                                                  | Hours/Week |           | Credit    | Marks      |
|-----|--------------------------------------------------------------------------------------|------------|-----------|-----------|------------|
|     |                                                                                      | Theory     | Practical |           |            |
| 1   | Common course - Numerical Analysis                                                   | 4          |           | 4         | 50         |
| 2   | Complementary IV - Mathematics IV                                                    | 4          |           | 3         | 50         |
| 3   | Core course 8 - Operating system                                                     | 4          |           | 3         | 50         |
| 4   | Core course 9 -Java Programming                                                      | 4          |           | 3         | 50         |
| 5   | Core course 10 -Linux Administration                                                 | 4          |           | 3         | 50         |
| 6   | Core course 11- Lab –III Data Structure & DBMS                                       |            |           | 3         | 25         |
| 7   | Core course 12 Lab – IV Java Programming, Shell Programming and Linux Administration |            | 5         | 3         | 25         |
|     | <b>Total</b>                                                                         | <b>20</b>  | <b>5</b>  | <b>22</b> | <b>300</b> |

## Semester –V

| No. | Title of the Course                            | Hours/Week |           | Credit    | Marks      |
|-----|------------------------------------------------|------------|-----------|-----------|------------|
|     |                                                | Theory     | Practical |           |            |
| 1   | Core course 13 - Software Engineering          | 4          |           | 3         | 50         |
| 2   | Core course 14 - Data Communication & Networks | 4          |           | 3         | 50         |
| 3   | Core course 15 - Enterprise Java Programming   | 4          | 4         | 3         | 50         |
| 4   | Core course 16 - C# and .Net Programming       | 3          | 4         | 2         | 50         |
| 5   | Open course                                    | 2          |           | 2         | 25         |
|     | <b>Total</b>                                   | <b>17</b>  | <b>8</b>  | <b>13</b> | <b>225</b> |

## Semester –VI

| No. | Title of the Course                                  | Hours/Week |           | Credit    | Marks      |
|-----|------------------------------------------------------|------------|-----------|-----------|------------|
|     |                                                      | Theory     | Practical |           |            |
| 1   | Core course 17 - Web Technology                      | 2          |           | 2         | 50         |
| 2   | Core course 18 - Data Mining & Data Warehousing      | 4          |           | 3         | 50         |
| 3   | Core course 19 - Elective I                          | 4          |           | 3         | 50         |
| 4   | Core course 20 - Elective II                         | 4          |           | 3         | 50         |
| 5   | Core course 21 - System Software                     | 3          |           | 2         | 50         |
| 6   | Core course 22 - Lab – V Enterprise Java Programming |            |           | 3         | 25         |
| 7   | Core course 23 - Lab – VI .Net Programming           |            |           | 3         | 25         |
| 8   | Core course 24 - Lab – VII Web Technology            |            | 3         | 2         | 25         |
| 9   | Core course 25 - Lab – VIII Project                  |            | 5         | 4         | 50         |
|     | <b>Total</b>                                         | <b>17</b>  | <b>8</b>  | <b>25</b> | <b>375</b> |

**Common course:**

Means a course that comes under the category of courses, including compulsory English and additional language courses and a set of general courses. There are 10 common courses for the BCA programme. This includes four English courses (two courses each in first and second semesters), two additional language courses (one course each in first and second semesters) and four General courses (one in first semester, two in third semester and one in fourth semester). The syllabi of general courses include the topics related to Computer Application.

**Complementary Course:**

Means a course which is generally related to the core course (traditionally referred to as subsidiary paper). There is one Complementary subject for BCA programme. The total number of Complementary courses offered for BCA shall be FOUR. Complementary courses are offered during first to fourth semesters.

**Core course:**

Means a compulsory course in a subject related to a particular degree programme. The core subject Computer Application consists of 17 theory papers, 7 practical papers and 1 project work. The semester wise list of Core and General Courses is given in the following tables.

**Open course:**

Means a course which can be opted by a student at his/her choice. There shall be one open course in core subjects in the fifth semester. The open course shall be open to all the students in the institution except the students in the parent department. For the purpose of open course B.Sc Computer Science and BCA should be considered as a single department. The students can opt for that course from any other department in the institution. Each department can decide the open course from a pool of three courses offered by the university. A department can offer only one open course in one semester.

## Scheme Core, General and Open - Courses (BCA)

| S.No | Sem | Course Code | Course Name                                                         | Hours/Week |           | Credits |
|------|-----|-------------|---------------------------------------------------------------------|------------|-----------|---------|
|      |     |             |                                                                     | Theory     | Practical |         |
| 1    | I   | 1A11BCA     | Informatics for Computer Application                                | 3          |           | 4       |
| 2    | I   | 1B01BCA     | Programming in C                                                    | 2          | 2         | 2       |
|      |     |             |                                                                     |            |           |         |
| 3    | II  | 2B02BCA     | Digital Systems                                                     | 3          |           | 2       |
| 4    | II  | 2B03BCA     | Object Oriented Programming Using C++                               | 2          |           | 3       |
| 5    | II  | 2B04BCA     | Lab – I Programming in C                                            |            |           | 2       |
| 6    | II  | 2B05BCA     | Lab – II Programming in C++                                         |            | 2         | 2       |
|      |     |             |                                                                     |            |           |         |
| 7    | III | 3A12BCA     | Data Structure                                                      | 4          | 3         | 4       |
| 8    | III | 3A13BCA     | Database Management System                                          | 4          | 2         | 4       |
| 9    | III | 3B06BCA     | Computer Organization                                               | 4          |           | 3       |
| 10   | III | 3B07BCA     | Introduction to Microprocessors                                     | 4          |           | 3       |
|      |     |             |                                                                     |            |           |         |
| 11   | IV  | 4A14BCA     | Numerical Analysis                                                  | 4          |           | 4       |
| 12   | IV  | 4B08BCA     | Operating System                                                    | 4          |           | 3       |
| 13   | IV  | 4B09BCA     | Java Programming                                                    | 4          |           | 3       |
| 14   | IV  | 4B10BCA     | Linux Administration                                                | 4          |           | 3       |
| 15   | IV  | 4B11BCA     | Lab–III Data Structures and DBMS                                    |            |           | 3       |
| 16   | IV  | 4B12BCA     | Lab–IV Java Programming, Shell Programming and Linux Administration |            | 5         | 3       |

|    |    |           |                                     |   |   |   |
|----|----|-----------|-------------------------------------|---|---|---|
| 17 | V  | 5B13BCA   | Software Engineering                | 4 |   | 3 |
| 18 | V  | 5B14BCA   | Data Communication & Networks       | 4 |   | 3 |
| 19 | V  | 5B15BCA   | Enterprise Java Programming         | 4 | 4 | 3 |
| 20 | V  | 5B16BCA   | C# and .Net Programming             | 3 | 4 | 2 |
| 21 | V  | 5D - -BCA | Open Course                         | 2 |   | 2 |
| 22 | VI | 6B17BCA   | Web Technology                      | 2 |   | 2 |
| 23 | VI | 6B18BCA   | Data Mining & Data Warehousing      | 4 |   | 3 |
| 24 | VI | 6B19BCA   | Elective I                          | 4 |   | 3 |
| 25 | VI | 6B20BCA   | Elective II                         | 4 |   | 3 |
| 26 | VI | 6B21BCA   | System Software                     | 3 |   | 2 |
| 27 | VI | 6B22BCA   | Lab – V Enterprise Java Programming |   |   | 3 |
| 28 | VI | 6B23BCA   | Lab – VI .Net Programming           |   |   | 3 |
| 29 | VI | 6B24BCA   | Lab – VII Web Technology            |   | 3 | 2 |
| 30 | VI | 6B25BCA   | Lab – VIII Project                  |   | 5 | 4 |

### Scheme of Open course for 5<sup>th</sup> semester

| Sl. No. | Sem | Course Code | Name of the Course         | Hours / Week | Credit |
|---------|-----|-------------|----------------------------|--------------|--------|
| 1       | V   | 5D01BCA     | Programming with C         | 2            | 2      |
| 2       | V   | 5D02BCA     | Web Technology             | 2            | 2      |
| 3       | V   | 5D03BCA     | Database Management System | 2            | 2      |



## Electives:

Course 6B19BCA shall be selected from Section A and Course 6B20BCA shall be selected from Section B

| No               | Sem | Course Code   | Course Name                   | Hours/Week | Credits |
|------------------|-----|---------------|-------------------------------|------------|---------|
| <b>SECTION A</b> |     |               |                               |            |         |
| 1                | VI  | 6B19BCA - E01 | Information Security          | 4          | 3       |
| 2                | VI  | 6B19BCA - E02 | Information Storage System    | 4          | 3       |
| 3                | VI  | 6B19BCA - E03 | Mobile Communications         | 4          | 3       |
| <b>SECTION B</b> |     |               |                               |            |         |
| 4                | VI  | 6B20BCA - E04 | Algorithm Analysis and Design | 4          | 3       |
| 5                | VI  | 6B20BCA - E05 | Network Programming           | 4          | 3       |
| 6                | VI  | 6B20BCA - E06 | Digital Image Processing      | 4          | 3       |

### CREDITS

Each course shall have certain credits. For passing the BCA programme the student shall be required to achieve a minimum of 120 credits of which 38 credits (14 credits for English courses, 8 credits for Additional language courses and 16 credits for General courses) shall be from common courses. Minimum credits required for core, complementary and open courses put together are 82.

## CREDIT DISTRIBUTION (LRP- BCA)

| SUBJECT              | SEMESTER     | COMMON    |            | GENERAL   | CORE                  | COMPLEMENTARY | OPEN     | TOTAL      |
|----------------------|--------------|-----------|------------|-----------|-----------------------|---------------|----------|------------|
|                      |              | ENGLISH   | ADDITIONAL |           |                       |               |          |            |
| COMPUTER APPLICATION | I            | 4+3       | 4          | 4         | 2                     | 3             | ----     | 20         |
|                      | II           | 4+3       | 4          | ----      | 2+3+2+2               | 3             | ----     | 23         |
|                      | III          | ----      | ----       | 4+4       | 3+3                   | 3             | ----     | 17         |
|                      | IV           | ----      | ----       | 4         | 3+3+3+3+3             | 3             | ----     | 22         |
|                      | V            | ----      | ----       | ----      | 3+3+3+2               | ----          | 2        | 13         |
|                      | VI           | ----      | ----       | ----      | 2+3+3+3+2+3+3<br>+2+4 | ----          | ----     | 25         |
|                      | <b>TOTAL</b> | <b>14</b> | <b>8</b>   | <b>16</b> | <b>68</b>             | <b>12</b>     | <b>2</b> | <b>120</b> |

### ATTENDANCE

Minimum 75% attendance is compulsory for theory as well as practical courses, failing which a student is not eligible to appear for university examinations.

### SEMINARS / ASSIGNMENTS

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

### PROJECT WORK

Every student of BCA Programme shall have to work on a project of four credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation (Project) at the end of sixth semester. Individual projects are recommended but in an instance where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to **FOUR**.

## RECORDS

A record is compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works.

## COURSE EVALUATION

The evaluation scheme for each course shall contain two parts

1. Internal Assessment (IA)
2. External Evaluation (End Semester Evaluation ESE)

20% weight shall be given to the internal evaluation. The remaining 80% weight shall be for the external evaluation. The distribution of marks for each course is given in following table:

### Scheme of mark distribution of BCA programme

| Courses       |                | No of Courses | Marks Per Course |     |                   | Total Marks |
|---------------|----------------|---------------|------------------|-----|-------------------|-------------|
|               |                |               | Int              | Ext | Total (Int + Ext) |             |
| Common        | English        | 4             | 10               | 40  | 50                | 200         |
|               | Addl. Language | 2             | 10               | 40  | 50                | 100         |
|               | General        | 4             | 10               | 40  | 50                | 200         |
| Complementary | Mathematics    | 4             | 10               | 40  | 50                | 200         |
| Core          | Theory         | 17            | 10               | 40  | 50                | 850         |
|               | Practical      | 7             | 5                | 20  | 25                | 175         |
|               | Project        | 1             | 10               | 40  | 50                | 50          |
| <b>Total</b>  |                |               |                  |     |                   | <b>1800</b> |

### Internal Assessment:

20% of the total marks in each course are for internal assessment. The marks secured for internal assessment only need be sent to university by the colleges concerned. The internal assessment shall be based on a predetermined transparent system involving written test, assignments/ seminars/ Viva and attendance in respect of theory courses and submissions and records, tests and attendance in respect of practical courses. Components with percentage of marks of Internal Evaluation of Theory Courses are-

|                          |       |
|--------------------------|-------|
| Attendance               | - 25% |
| Assignment/ Seminar/Viva | - 25% |
| Test paper               | - 50% |

For practical courses-

|                        |       |
|------------------------|-------|
| Attendance             | - 25% |
| Submissions and Record | - 25% |
| Practical Test Paper   | - 50% |

(If a fraction appears in total internal marks, nearest whole number is to be taken)

Attendance of each course shall be evaluated as below

| Attendance %  | % Marks Allotted                 |
|---------------|----------------------------------|
| Above 90%     | 100%                             |
| 85 to 89%     | 80%                              |
| 80 to 84 %    | 60%                              |
| 75 to 79 %    | 40%                              |
| Less than 75% | Not eligible for University exam |

### Theory External Evaluation:

External evaluation carries 80% of marks. All question papers shall be set by the university. The external examination in theory courses is to be conducted with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined Scheme of valuation and answer keys provided by the University. Details regarding the End Semester Evaluation of core and open courses are

given below:

### 1. Core Courses

- Maximum Marks for each course - **40 Marks**
- Duration of examination - **3 Hrs.**

| Sl.No | Type of Question                       | Marks | Number of Questions to be answered / total number of questions | Max. Marks |
|-------|----------------------------------------|-------|----------------------------------------------------------------|------------|
| 1     | A bunch of 8 one word answer questions | 0.5   | 08/08                                                          | 4          |
| 2     | Short answer                           | 2     | 07/10                                                          | 14         |
| 3     | Short Essay /Programs                  | 3     | 04/6                                                           | 12         |
| 4     | Essay Type                             | 5     | 02/4                                                           | 10         |

### 2. Open Course

- Maximum Marks for open course - **20 Marks**
- Duration of examination - **2 Hrs.**

| Sl.No | Type of Question                       | Marks | Number of Questions to be answered / total number of questions | Max. Marks |
|-------|----------------------------------------|-------|----------------------------------------------------------------|------------|
| 1     | A bunch of 8 one word answer questions | 0.5   | 08/08                                                          | 4          |
| 2     | Short answer                           | 2     | 03/05                                                          | 6          |
| 3     | Short Essay /Programs                  | 3     | 02/04                                                          | 6          |
| 4     | Essay Type                             | 4     | 01/02                                                          | 4          |

### External Evaluation Practical

External evaluation carries 80% of marks. All question papers shall be set by the

university. The external examination in practical courses shall be conducted by **TWO** external examiners appointed by the University. No practical examination will be conducted in odd semester. Practical examinations shall be conducted in the even semester (II, IV and VI). The Scheme of Examinations and Model Question Papers of all the theory and practical courses offered under core, general and open courses are include in the detailed syllabus. Practical examination assessment of different components may be taken as below.

| Components                                | Part A    | Part B    |
|-------------------------------------------|-----------|-----------|
| Program writing                           | 3         | 3         |
| Compilation/Execution<br>(without errors) | 2         | 2         |
| Correct Output                            | 2         | 2         |
| Modification                              | 1         | 1         |
| Viva-voice                                | 2         | 2         |
| <b>Total</b>                              | <b>10</b> | <b>10</b> |

### **Project Evaluation**

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

| Internal (20% of the total)                        |            |           | External ( 80% of Total)                                         |            |           |
|----------------------------------------------------|------------|-----------|------------------------------------------------------------------|------------|-----------|
| Components                                         | % of Marks | Marks     | Components                                                       | % of Marks | Marks     |
| Punctuality                                        | 20         | 02        | Written Synopsis/Abstract                                        | 12.5       | 5         |
| Relevance of topic System study / Design of tables | 20         | 02        | Content of the Project                                           | 12.5       | 5         |
|                                                    |            |           | Quality of project work/Use of software/ tools                   | 12.5       | 5         |
|                                                    |            |           | Perfection of the work (Designs of tables/ Input & Output forms) | 25         | 10        |
|                                                    |            |           | Live demo                                                        | 12.5       | 5         |
| Project Report                                     | 30         | 03        | Viva-Voce                                                        | 25         | 10        |
| Presentation & Viva-voce                           | 30         | 03        |                                                                  |            |           |
| <b>Total</b>                                       | <b>100</b> | <b>10</b> | <b>Total</b>                                                     | <b>100</b> | <b>40</b> |

External Examiners will be appointed by the University in consultation with the Chairperson of the Board. Project evaluation shall be done along with the external examination of Core Practical lab IV & V in sixth semester.

**Pass Conditions:**

Submission of the project report and presentation of the student for viva are compulsory for the evaluation. No marks shall be awarded to a candidate if she/he fails to submit the project report for external evaluation. The student should get a minimum of 40 % marks for pass in the project. There shall be no improvement chance for the Marks obtained in the Project Report. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re-done and the report may be re-submitted along with subsequent exams through parent department.

# 1A11BCA

## INFORMATICS FOR COMPUTER APPLICATION

**Hours per Week : 3**

**Credits : 4**

### **Objectives**

- To review the basic concepts & functional knowledge in the field of informatics.
- To review functional knowledge in a standard office package and popular utilities
- To create awareness about nature of the emerging digital knowledge society
- To create awareness about social issues and concerns in the use of digital technology
- To impart skills to enable students to use digital knowledge resources in learning.

### **Course Outline**

#### **Module I** : (Ref Essential reading 1)

Computer basics ; Evolution, generation and classification of computers. Computer Organization and Architecture : CPU; Communication among various units; Instruction format; Instruction cycle; Instruction set; Data representation; coding schemes. Computer memory and Storage : Memory hierarchy; RAM; ROM; secondary storages-magnetic, optical and magneto-optical storage devices. Mass storage devices.

#### **Module II** : (Ref Essential reading 1)

Input output devices -Types of I/O devices. Software : definition; categories; software terminologies. Operating system : introduction, definition, evolution; types; functions.

#### **Module III** : (Ref Essential reading 1)

Computer Programming and languages (Introduction only) : Algorithm; Flow chart; Pseudo code; Program control structures; Programming paradigm; Programming languages; Generation of programming languages.

#### **Module IV** - KNOWLEDGE SKILLS FOR HIGHER EDUCATION

Data, information and knowledge, knowledge management- Internet access methods – Dial-up, DSL, Cable, ISDN,Wi-Fi - Internet as a knowledge repository, academic search techniques, open access initiatives, open access publishing models. Basic concepts of IPR, plagiarism, introduction to use of IT in teaching and learning,

#### **Module V** - SOCIAL INFORMATICS

IT & Society- issues and concerns- digital divide, IT & development, the free software movement , cyber ethics, cyber crime, cyber threats, cyber security, privacy issues, cyber laws, cyber addictions, guide lines for proper usage of computers, internet and mobile phones.

Note : a Practical / demonstration sessions may arranged for selected topics.

- b. Self study / seminars / group discussion shall be encouraged for this course.



### Essential Reading

1. Introduction to information Technology, ITL Education solutions, Pearson Education
2. V. Rajaraman, Introduction to Information Technology, Prentice Hall
3. Technology in Action, Pearson
4. Alexis Leon & Mathews Leon, Computers Today, Leon Vikas,
5. Peter Norton, Introduction to Computers,6e,(Indian Adapted Edition).

### Additional References

- Greg Perry, SAMS Teach Yourself Open Office.org, SAMS,
- Alexis & Mathews Leon, Fundamentals of Information Technology, Leon Vikas
- George Beekman, Eugene Rathswohl, Computer Confluence, Pearson Education,
- Barbara Wilson, Information Technology: The Basics, Thomson Learning
- John Ray, 10 Minute Guide to Linux, PHI, ISBN 81-203-1549-9
- Ramesh Bangia, Learning Computer Fundamentals, Khanna Book Publishers

## Model Question Paper

### 1A11BCA INFORMATICS FOR COMPUTER APPLICATION

**Time: 3 Hrs**

**Max. Marks: 40**

#### SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**
- a. The fastest memory in a computer system is-----
  - b. -----enables the processor to access data quickly whenever they are needed.
  - c. PDA stands for-----
  - d. An individual small dot, which one sees on the computer screen is called-----
  - e. A register that keep track of next instruction to be executed is called a ....
  - f. RAID stands for .....
  - g. The best suitable devices for bank cheques .....?
  - h. The semantic and syntax errors in a program are checked in:

**SECTION B**

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. Convert binary 00011011 to decimal.
3. What is a system bus?
4. Define an algorithm.
5. Define operating system.
6. What are the new threats in the IT industry.
7. What is Unicode?
8. Explain ISDN.
9. What is a compiler?
10. Define data and information.
11. Define instruction cycle.

**SECTION C**

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. Discuss IPR
13. Draw a flow chart to find the largest of three numbers.
14. Write a note on Cyber Security.
15. Give the importance of IT in teaching and learning.
16. Explain about the input and output devices.
17. List and explain features of operating systems.

**SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. a. Discuss internet as a knowledge repository  
b . Write notes on cyber crime.
19. What are the Internet access methods? Explain any four.
20. Write a note on program testing and debugging.
21. Explain about the generation and classification of computers.

# 1B01BCA

## PROGRAMMING IN C

Hours per Week : Theory- 2 Practical- 2

Credits : 2

### **Objectives :**

- *To learn basic concepts in programming.*
- *Develop skill in programming*
- *Familiarize the basic syntax and semantics of c language.*
- *To design algorithm for solving a programming problem.*
- *Familiarize with advanced features of c.*

### **Module I**

Algorithms and Flow charts: Definitions, Symbols used, Program : structure, top-down design, source code, object code, executable file, file extensions. Importance of C; Basic structure of C, Programming style, executing a c program. Character set, C tokens, Keywords, identifiers, Constants, data types, declaration of variables, arithmetic operators , logical operators, Relational operators, Assignment operators, Increment and decrement operators, conditional operators, Bitwise operators. Precedence and order of evaluation. type conversion in expression. common programming errors, program testing and debugging, program efficiency.

### **Module II**

Managing Input output operation: reading a character, writing a character, formatted input output. Branching statements-if, if..else, nested if...else, else...if ladder, switch statement, go to statement. Looping statements- while, do...while, for loop. Break and continue statements.

### **Module III**

Arrays: One dimensional arrays, two dimensional arrays, Initializing array elements, Multidimensional arrays. Strings: declaration and initializing, reading and writing. Arithmetic operations on character. String handling functions .Functions: Library and user defined, defining a function, calling a function. Parameter passing techniques, Scope and life time of variables in function, recursive functions, arrays and functions.

### **Module IV**

Structure and union: definition, giving values to members, initialization. Array of structures, array with in structure, structure with in structure, union. Pointers: accessing the address of a variable, declaration and initializing pointers, accessing a variable through its pointers, pointer arithmetic, pointers and arrays (pointer to array and array of pointers) , pointers and character string , pointer and functions. Dynamic memory allocation: malloc(), calloc(), free(),realloc().

## Module V

File Management: Text and binary files, Defining and opening a file, closing a file, input and output operations on file, error handling, random access file. Command line arguments.

### **Text Book :**

1. ANSI C, E. Balagurusamy, 3<sup>rd</sup> edition McGraw-Hill Publication

### **Reference books:**

3. Computer Basics and c Programming, V. Rajaraman, PHI, 2008
4. Programming with ANSI and Turbo C, Ashok N. Kamthane, 1<sup>st</sup> edn, Pearson Education.
5. Let us C, Yeshvanth Kanethkar, 3<sup>rd</sup> Edn, BPB,
6. Programming with C in Linux, NIIT, PHI.
7. C by Example, Noel Kalicharan, Cambridge University press.

## **Model Question Paper 1B01BCA PROGRAMMING IN C**

**Time: 3 Hrs**

**Max. Marks: 40**

### SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**
2. Maximum number of elements in a [5] [13] is .....

3. What will be the output of the following code:

```
void main(){ int x;
for(x=1;x<=5;x++);
printf(“%d”,x); }
```

- c. .... is a method for packing data of different types.
- d. The strcmp() function compares two strings identified by the arguments and returns the value ..... if they are equal.
- e main() is an example of .....function.
- f. A variable which declared in static storage class has initial value.....
- g. C program uses a semicolon as a .....
- h. The string related file supplied by C standard library is ....

### SECTION B

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. List and explain logical operators in c.
3. What is the value of Z if X=2; Y=X++; Z = ++X;
4. Write if statements required to find the minimum of three integers i, j and k.
5. Write necessary array declaration statements: list of 100 integers, a matrix of size 10x20 and a list of 100 names.
6. Differentiate between structure and union.
7. Explain the following : int \*k = malloc (sizeof int);
8. Differentiate between text and binary files.
9. Explain the variable naming convention in C.
10. How will you read and write a character in C.
11. What are C Tokens.

### SECTION C

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. Write algorithm to find the roots of a quadratic equation.
13. Write c program to read n positive integers and print number of odd and even numbers.
14. With suitable example(s), explain parameter passing techniques in c functions.
15. Explain how a one dimensional array can be accessed with pointers. With suitable example discuss pointer arithmetic.
16. With suitable examples, explain break and continue statements.
17. Write c program to read n positive integers and print number of odd and even numbers.

### SECTION D

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. With suitable examples explain the following:
  - a. Switch statement.
  - b. Recursive function.
  - c. Conditional compilation.
- 19 Write a complete program to read two matrices and print their product. (Use function for various sub tasks)
- 20 Explain about the looping statements in C.
- 21 Explain the different data types in C

**SEMESTER II****2B02BCA**  
**DIGITAL SYSTEMS****Hours per Week : Theory - 3****Credits : 2****Objectives:**

- *Introduce the basic concepts in digital electronics.*
- *Appreciate significance of digitals systems in computer science.*
- *Familiarize with basic building blocks of digital systems.*
- *Design simple combinational digital systems.*
- *Familiarize different number systems and codes.*

**Module I**

Digital Principles: Definitions; digital Waveforms; digital Logic; Digital operations; Digital ICs and Signal Levels (Basic ideas only). Digital Logic: Basic Gates; Boolean algebra; NOR and NAND gates; AND-OR-INVERT gates; positive and Negative logic.

**Module II**

Combinational Logic Circuits: Boolean laws and Theorems; SOP methods; Truth table and K-map, K-map simplification (up to four variable); Data-processing circuits: Multiplexers; Demultiplexers; 1-of-16 decoder; BCD to decimal decoder; Seven-segment decoder; Encoders; Ex-Or gates; Parity generators and checkers; ROM .

**Module III**

Octal and Hexadecimal number system; CODES : ASCII, Excess-3, GRAY and UNICODE. Binary number representation and arithmetic; Arithmetic Building blocks; ADDER – SUBTRACTOR.

**Module IV :**

FLIP FLOPS : RS ; Gated FFs; Edge triggered RS, D and JK flip Flops; Flip flop Timings; JK Master Slave Flip flops. Registers : Types : Serial in – Serial Out; Serial In – parallel out; parallel In – Serial Out; Parallel In – parallel Out; ring Counters.

**Module V :**

Counters : Asynchronous counters ; Decoding gates; Synchronous counters; changing the counter Modulus; Decade counters; Presetable counters; Shift counters; A Mod-10 Shift Counter with encoding.

**Text Books:**

1. Digital Principles and Applications; Leach and Malvino; TMH; 6<sup>th</sup> edn

**Reference**

1. Digital Fundamentals, Floyd, 10<sup>th</sup> Edn, Prentice Hall.

## Model Question Paper

### 2B02BCA DIGITAL SYSTEMS

Time: 3 Hrs

Max. Marks: 40

#### SECTION A

1. **One word answer** (8 x 0.5 = 4 marks)

- a. A quantity having continuous value is called.....
- b. 01100100 divided by 00011001 is.....
- c. In ..... Gate similar input produces a LOW
- d. When both inputs of a JK flip flops are high , the output will.....
- e. The modulus-10 Johnson counter is requires.....number of flip flops
- f.  $A+1=$ .....
- g. Which gate has Universal property ?
- h. A synchronous decade counter requires ..... number of flip flops

#### SECTION B

Write short notes on **ANY SEVEN** of the following questions (7 x 2 = 14 marks)

2. Write a short note on Digital data.
3. Convert the following to binary system
  - a.  $(100100.01)_{10}$
  - b.  $(0001011.101)_{10}$
4. Explain DeMorgan's theorem
5. Explain the universal property of NOR gate
6. Draw the circuit and truth table of an SR latch
7. State and prove any four rules of Boolean algebra.
8. What are edge-triggered flip flops?
9. Draw the logic circuit of gated D-latch.
10. Explain the Grey to binary code converter.
11. Write a short note on ripple counters.

#### SECTION C

Answer **ANY FOUR** of the following questions (4 x 3 = 12 marks)

12. What is a full adder explain?
13. Apply Demorgans theorem and simplify the expression  $XY'Z'+X'Y'W+XZ'$ .
14. Compare multiplexers and demultiplexers.
15. Differentiate synchronous and asynchronous counters.
16. What are flip-flops? Explain its applications.
17. Explain up/down counter in detail

#### SECTION D

Write an essay on **ANY TWO** of the following questions (2 x 5 = 10 marks)

18. Write a note on K map. Minimize the following expression  
 $B'C'D'+A'BC'D'+ABC'D'+A'B'CD+AB'CD+A'B'CD'+A'BC'D'+ABCD'+AB'CD'$
19. What is a decoder. Explain the 7 segment display decoder.
20. Explain four-bit synchronous decade counter
21. What are shift registers? Draw and explain the diagram of serial in-parallel out shift register.

## 2B03BCA

# OBJECT ORIENTED PROGRAMMING USING C++

**Hours per Week : Theory - 2**

**Credits : 3**

**Objectives:**

- *.Introduce concepts such as classes and objects.*
- *Define and use classes and objects using C++ language.*
- *Introduce OOPs concepts such as inheritance and polymorphism and their implementation using C++.*

**Module I :**

Principles of object oriented programming; OOP paradigm; Basic concepts of OOP; Benefits; applications. Introduction to C++, Structure of C++ program; Tokens, Keywords, identifiers and constants; Data types, symbolic constants; type compatibility; declaration and dynamic initialization of variables; reference variables. Operators, manipulators; type cast operators; Expressions, implicit conversions; operator overloading; operator precedence; Control structures.

**Module II :**

Functions; function overloading; friend and virtual functions; Math library functions. Structures; Specifying a class; Defining member functions; making an outside function inline; nesting of member functions; private member functions; arrays within a class; memory allocation for objects; static data members; static member functions; arrays of objects; objects as function arguments; friendly functions; returning objects; const member functions; pointer to members; Local classes.

**Module III :**

Constructors and destructors; dynamic initialization of objects; copy constructor; Dynamic constructors; const objects; Destructors. Operator overloading – definition; overloading unary operators; overloading binary operators; overloading binary operators using friends; manipulation of strings using operators; rules for overloading operators. Type conversions.

**Module IV**

Inheritance – defining derived classes; making a private member inheritance; Types of inheritance; virtual base classes; abstract classes; constructors in derived classes; Nesting of classes. Pointers; Pointers to objects; Pointers to derived classes; virtual functions; pure virtual functions.

**Module V :**

C++ streams; stream classes; unformatted I/O operations; Formatted console I/O operations; Managing output with manipulators. files – classes for file stream operations; Opening and closing a file; file modes; file pointers and their manipulations; Sequential input and output operation.



**Text book:**

1. Object Oriented Programming with C++; E. Balagurusamy; 3rd Edn; TMH 2006

**Reference Books: .**

1. Programming in C++, M.T. Somashekara, Prentice Hall of India, New Delhi
2. Object Oriented Programming with ANSI & Turbo C++, Ashok N. Kamthane, Pearson Education
3. Let us C++, Yeshwanth Kanethkar, BPB

## Model Question Paper

### 2B03BCA OBJECT ORIENTED PROGRAMMING USING C++

**Time: 3 Hrs**

**Max. Marks: 40**

#### SECTION A

**1. One word answer**

**(8 x 0.5 = 4 marks)**

- a) Instance of a class is called \_\_\_\_\_
- b) \_\_\_\_\_ is memory dereferencing operator.
- c) The default access level assigned to members of a class is \_\_\_\_\_
- d) Default value of a static variable is \_\_\_\_\_
- e) Every class has .....constructor function, even when none is declared.
- f) Abstract class has \_\_\_\_\_ number of objects.
- g) In operator overloading unary operator has \_\_\_\_\_ number of arguments.
- h) Mechanism of deriving a class from another derived class is known as \_\_\_\_\_

#### SECTION B

**Write short notes on ANY SEVEN of the following questions**

**(7 x 2 = 14 marks)**

2. Explain reference variable with suitable example.
3. Explain scope resolution operator.
4. Write a note on inline function.
5. Write a note on array of objects.
6. What is a destructor?
7. What are the rules for operator overloading?
8. Explain abstract base class.
9. Write a note on nesting of classes.
10. What is the use of fstream class?
11. Describe various file mode options

**SECTION C****Answer ANY FOUR of the following questions****(4 x 3 = 12 marks)**

12. Explain the difference between while and do-while loops.
13. Discuss function overloading with suitable examples.
14. Explain copy constructors with suitable example.
15. Explain about virtual base class.
16. Write a C++ program to write and read integers from a file.
17. Write a C++ program to add two complex numbers using operator overloading

**SECTION D****Write an essay on ANY TWO of the following questions****(2 x 5 = 10 marks)**

18. Explain the basic concepts of Object Oriented Programming.
19. Explain the following :
  - a). Friend Function
  - b). Static member functions.
20. Write a note on Operator Overloading.
21. Explain Inheritance and its types with suitable example.

## 2B04BCA LAB – I

### PROGRAMMING IN C

Credits : 2

#### Objectives:

- Skill in Programming using c language.
- Expertise in c program development steps: edit, compile, debug, execute and test under Windows as well as Linux platforms.

#### Sample Program List

Students have to practice all programs and record a minimum of 15 programs. They have to be familiar both in windows and Linux platforms.

#### Part A (Minimum 10 programs)

- 1 Write a program to print the size of all the data types in C and its range.
- 2 Write a program to convert Fahrenheit to Celsius.
- 3 Write a program to check whether the given number is a Prime number or not.
- 4 Write a program to accept three numbers and find the largest and second largest
- 5 Write a program to print all prime numbers between any 2 given limits.
- 6 Write a program to print all the Armstrong numbers between any 2 given limits.
- 7 Write a program to check whether the string is a Palindrome.
- 8 Write a program to check whether a given matrix is an Identity matrix or not.
- 9 Write a program to perform matrix multiplication.
- 10 Write a program to count the different vowels in a line of text.
- 11 Write a program to accept two numbers and perform various arithmetic operations (+, -, \*, /) based on the symbol entered.
- 12 Write a program to find the roots of a quadratic equation
- 13 Write a recursive program to find the factorial of a number.
- 14 Create an employee structure and display the same.
- 15 Write a function to swap two numbers using pointers
- 16 Write a program to access an array of integers using pointers
- 17 Create a file and store some records in it. Display the contents of the same.
- 18 Implement search, modify, and delete operations.
- 19 Perform the different bitwise operations (menu driven program) .The i/p and the o/p should be displayed in Binary form.
- 20 Write a program to check whether a given number is odd or even using bitwise operators.

## **2B05BCA LAB – II**

### **PROGRAMMING IN C++**

**Hours per Week: Practical - 2**

**Credits : 2**

#### **Sample Programs List**

Students have to practice all programs and record a minimum 15 programs. All programs must be based on OOP concepts.

1. Program to find the factorial of a number using recursion.
2. Program to find whether the given number belongs to fibonacci series.
3. Program to find whether the string is palindrome or not. Use pointers.
4. Write a program to sort n numbers.
5. Program to find biggest, smallest, sum and difference of two numbers using inline function.
6. Program to find the area and volume of respective figures using function overloading.
7. Program to add one day to a given date.
8. Program to add and subtract two matrices.
9. Program to multiply two matrices.
10. Program to find the trace and transpose of a matrix.
11. Program to show stack operations.
12. Create a class time comprises hr,min and sec.as member data and add() and display() as member functions. Use constructor to initialise the object. write a main function to add two time objects, store it in another time object and display the resultant time
13. Program to negate the elements of an array. Use operator overloading function with the operator -.
14. Program to compare two strings. Use operator overloading (==). Do not use any built in functions.
15. Define a class student with name, reg.no, date of birth and name of college as member data and functions to get and display these details. Design another class Test with subjects of study and grade for each subject as member data and corresponding input and output functions. Derive a class Result from both Student and Test classes and Print the Result of each student with relevant information.
16. Start with an array of pointers to strings representing the days of the week. Provide functions to sort the strings into alphabetical order. Use pointers
17. Create a class person with personal details. Define two functions, set details and printdetails. Declare array of pointers to person class and write a main function to set and print the details of n persons using pointers.
18. Design two classes A and B with member data n1 and n2 respectively. Set values for each one. Write a program to interchange the values of both A and B. Use friend function.

19. Design a class SHAPE with dimensions d1 and d2 as member data and area() as member functions to find the area of a shape. Derive three classes RECT, TRIANG and CIRCL from the class SHAPE and override the function area() of base class to find the area of individual shape. Use virtual function.
20. Write a program to show returning current object, accessing member data of current object and returning values of object using this pointer.
21. Design a class employee with relevant emp details. Read the details of n emp from the keyboard and write it into a File named empdetails. At the end of writing every n emp details read them back from the same file and display into the screen. Use separate functions to write and read into and out of the file.
22. Addition / Subtraction / Multiplication of complex numbers using classes.
23. Define a class to represent a bank account. Include the following members :

Data Members:

1. Name of the depositor.
2. Account number.
3. Type of account.
4. Balance amount in the account.

Member Functions

1. To assign initial values.
2. To deposit an amount.
3. To withdraw an amount after checking the balance.
4. To display name and balance.

Use appropriate main program.

24. Assume that a bank maintain two types of accounts for customers, one called as saving account and the other as current account. The saving account provides compound interest and withdrawal facilities, but no check book facility. The current account provides check book facility but no interest. Current account holders should maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class ACCOUNT that stores customer name, account number and type of account. From this derive the classes CURR\_ACCT and SAVE\_ACCT to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks :
  1. Accept deposit from a customer and update the balance.
  2. Display the balance.
  3. Compute and deposit interest.
  4. Permit withdrawal and update balance.
  5. Check for the minimum balance, impose penalty if necessary and update the balance.

Note : Do not use constructors. Use member functions to initialize the class members.

- 25 Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called TRIANGLE and RECTANGLE from the base SHAPE. Add to the base class, a member function get\_data() to initialize base class data members and another member function display\_area() to compute and display the area of figures. Make display\_area() as a virtual function and redefine this function in the derived class to suite the requirements.

**SEMESTER III****3A12BCA  
DATA STRUCTURE****Hours per Week : Theory - 4 Practical - 3****Credits : 4*****Objectives:***

- *To familiarize students with concept of data structures and its relevance in computer science.*
- *To introduce the concept of analysis of algorithms and ability to compare algorithms based on time and space complexity.*
- *To familiarize with selected linear and nonlinear data structures.*
- *To enhance skill in programming.*

**Language for Implementation: C++****Module I**

Data structures: Definition and Classification. Analysis of Algorithms : Apriori Analysis; Asymptotic notation; Time complexity using O notation; Average, Best and Worst complexities. Arrays :- Operations; Number of elements; Array representation in memory. Polynomial- Representation with arrays; Polynomial addition. Sparse Polynomial:- representation. Sparse matrix: Efficient representation with arrays; Addition of sparse matrices. Recursive algorithms: examples – factorial and Tower of Hanoi problem.

**Module II**

Search : Linear and Binary search; Time complexity; comparison. Sort : Insertion, bubble, selection, quick and merge sort; Comparison of Sort algorithms.

**Module III**

Stack: Operations on stack; array representation. Application of stack- i. Postfix expression evaluation. ii. Conversion of infix to postfix expression. Queues: Operation on queue. Array Implementation; Limitations; Circular queue; Dequeue, and priority queue. Application of queue: Job scheduling.

**Module IV**

Linked list – Comparison with arrays; representation of linked list in memory. Singly linked list- structure and implementation; Operations – traversing/printing; Add new node; Delete node; Reverse a list; Search and merge two singly linked lists. Stack with singly linked list. Circular linked list – advantage. Queue as Circular linked list. Head nodes in Linked list – Singly linked list with head node – Add / delete nodes; Traversal / print. Doubly linked list – structure; Operations – Add/delete nodes ; Print/traverse. Advantages.

## **Module V**

Tree and Binary tree: Basic terminologies and properties; Linked representation of Binary tree; Complete and full binary trees; Binary tree representation with array. Tree traversal : Recursive inorder, preorder and postorder traversals. Binary search tree - Definition and operations (Create a BST, Search, Time complexity of search). Application of binary tree: Huffman algorithm.

### **Text Book :**

1. Data Structures and Algorithms: Concepts, Techniques and Applications; GAV Pai, Mc Graw Hill, 2008

### **Reference Books :**

2. Data Structures in C, Achuthsankar and Mahalekshmi, PHI, 2008
3. Fundamentals of Data structures in C++ , 2<sup>nd</sup> Edn, Horowitz Sahni, Anderson, Universities Press
4. Classic Data structures, Samanta, Second Edition, PHI

## **Model Question Paper**

### **3A12BCA DATA STRUCTURE**

**Time: 3 Hrs**

**Max. Marks: 40**

#### **SECTION A**

1. **One word answer** **(8 x 0.5 = 4 marks)**
  - a . A 2-D array is also called .....
  - b A data structure is said to be .....if its elements form a sequence.
  - c A .....is nothing but an array of characters.
  - d An array of pointers to strings stores .....of the strings
  - e The '\0' character indicates.....
  - f A matrix is called sparse when.....
  - g O notation stands for .....
  - h Basic operations in linked list are .....

### SECTION B

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

3. What is Apriori Analysis
4. How to delete an element from the linked list
5. Define data structure
6. What is a sparse matrix?
7. What is garbage collection?
8. What is compaction?
9. What is the use of stack in real life?
10. Define dynamic data structure
11. What is multi stacks?
12. What is the complexity of algorithms?

### SECTION C

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

13. Transform following prefix expression into infix a) +A-BC b)+-\$ABC\*D\*\*EFG
14. Explain binary search in detail.
15. Explain advantageous of circular linked list.
16. Write program to which count number of words in a given text.
17. How to delete elements from a double link list
18. What is a sparse matrix explain

### SECTION D

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

19. Write a program that would accept an expression in infix form and convert it to a prefix form
20. What are the different operations on linked list? Explain
21. What are the advantages of binary tree search?
22. Compare different sorting algorithms



## 3A13BCA

# DATABASE MANAGEMENT SYSTEM

**Hours per Week: Theory - 4      Practical - 2**

**Credit: 4**

**Objectives:**

- *Introduce the basic concepts in DBMS.*
- *Skill in designing database.*
- *Familiarization of different DBMS models.*
- *Skill in writing queries using MySQL.*

**Module I**

Introduction – purpose of Database systems. View of Data, data Models, transaction management, database structure, DBA, Data Base Users.

**Module II**

E-R model, Basic concepts; design issues; Mapping Constraints; Keys; Primary, Foreign, candidate, E-R diagram; Weak entity set; Extended E-R features. Normal forms – 1NF, 2NF, 3NF and BCNF; functional dependency, Normalization.

**Module III**

SQL : database languages; DDL; create, alter, Drop, DML, Insert into, Select, update, Delete,. DCL commands, Data types in SQL; Creation of database and user. Case study : MySQL.

**Module IV**

Developing queries and subqueries; Join operations; Set operations; Integrity constraints, views, Triggers, functions and Sequences. Case study : MySQL

**Module V**

Relational model – Structure of Relational database. Relational Algebra; Fundamental operations; Relational calculus; Tuple and domain calculus.

**Text books:**

1. Database system concepts; Silberschatz, Korth and Sudarsan, 5<sup>th</sup> Edn; McGraw Hill.
2. The database book : Principles and Practice Using MySQL; Gehani; University Press.

**Reference:**

1. Fundamentals of Database systems, E. Navathe, 4<sup>th</sup> edn, Pearson Education.

## Model Question Paper

### 3A13BCA – DATABASE MANAGEMENT SYSTEM

Time: 3 Hrs

Max. Marks: 40

#### SECTION A

1. **One word answer** (8 x 0.5 = 4 marks)
- a) The collection of information stored in the database is called.....?
  - b) The data hold across the primary key column must be \_\_\_\_\_
  - c) Primary goal of data base is?
  - d) \_\_\_\_\_ Keys represent relationships between tables
  - e) The structure of database is.....?
  - f) .....is the association among several entities?
  - g) For each attribute there is a set of permitted values is called \_\_\_\_\_
  - h) Example of derived attribute

#### SECTION B

**Write short notes on ANY SEVEN of the following questions** (7 x 2 = 14 marks)

2. What is the usage of CREATE command?
3. Write a note on E-R Model?
4. Explain about INSERT command?
5. Write a note on nave users and application programmers?
6. Which are the different types of attributes?
7. Explain UPDATE command.
8. Define foreign key.
9. Define functional dependency.
10. Write the syntax of Alter query and explain.
11. What is Projection operation in relational algebra.

#### SECTION C

**Answer ANY FOUR of the following questions** (4 x 3 = 12 marks)

12. Explain transaction management?
13. Explain the advantages of DBMS?
14. Which are the different types of keys?
15. Explain components of SQL?
16. Write a note on ALTER command?
17. Which are the different data types used in SQL

#### SECTION D

**Write an essay on ANY TWO of the following questions** (2 x 5 = 10 marks)

18. What do you mean by Database administrator? Explain functions of DBA?
19. Explain relational algebra?
20. Explain ER data Model.
21. Write a detailed note on normalization

## **3B06BCA**

# **COMPUTER ORGANIZATION**

**Hours per Week : Theory - 4**

**Credit: 3**

### ***Objectives***

- *To introduce the basic terminology of computer hardware.*
- *To familiarize the functional units of a computer system.*
- *To understand the basic operation of a computer system.*
- *To understand the memory organization in a computer system*

### **Module I**

Basic structure of computer-Types of computers-Functional Units-Basic operational Concepts-Bus structure-Multiprocessors and Multi computers-Data representation-Fixed Point representation and floating Point representation.

### **Module II**

Register Transfer and Micro operations – Register Transfer language-Register Transfer-Bus and memory Transfer-Three state bus buffers-Memory Transfer-Basic Computer Organization and Design – Instruction Codes – Fetch & Decode Instructions – Register Reference Instructions – Memory Reference Instruction – Input output & Interrupt.

### **Module III**

Micro Programmed Control – Control Memory – Address sequencing – Central Processing Unit – General Register Organization – Control word – Stack Organization – Register stack - Memory Stack – Reverse Polish notation – Evolution of Arithmetic expressions – Instruction Formats – Addressing modes – Data Transfer and Manipulations – reduced Instruction set computer(RISC)

### **Module IV**

Input Output Organization – Peripheral Devices – Input/Output Interfaces – Asynchronous Data Transfer – Modes of transfer –Priority Interrupt – Direct Memory Access (DMA) - Input Output Processor - Serial Communications.

### **Module V**

Memory Organization – Hierarchy – Main memory – Auxiliary Memory – Associative Memory – Cache memory – Mapping – Multiprocessors – Characteristics of multiprocessors - Inter connection structures – Inter Processor Arbitration.

### **Text Books**

1. Computer system Architecture –M.Morris Mano - PHI Pvt Limited
2. Computer Organization - Carl Hamacher –International Edition

### **References**

1. Computer Organization and Architecture , William Stallings, 7<sup>th</sup> Edn, Pearson Education.
2. Computer Architecture & Organization John P Hayes –Mc Graw Hill

## Model Question Paper

### 3B06BCA COMPUTER ORGANIZATION

Time: 3 Hrs

Max. Marks: 40

#### SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**
- a) The type of the addressing mode in which the effective address is equal to the address part of the instruction is .....
  - b) The register that hold the address of the stack is.....
  - c) The data register is some times called.....
  - d) The transfer of information from a memory word to outside environment is .....
  - e) The third state of three state bus buffer is .....
  - f) Which condition can be detected by observing the carry into the sign bit position and the carry out sign bit position.....
  - g) If the most significance digit of mantissa of floating point number is non zero then the number is said to be .....
  - h) The register that keeps track of address of the instruction is to be executed is called .....

#### SECTION B

**Write short notes on ANY SEVEN of the following questions** **(7 x 2 = 14 marks)**

2. Explain the relative address mode
3. What are the difference between the multiprocessors and multi computers?
4. Explain floating point representatives.
5. What is a register transfer?
6. What is an effective address?
7. Write three memory references instructions.
8. What is an interrupt cycle?
9. What are the major phases an instruction cycle?
10. What is RISC?
11. Explain base register address Mode.

#### SECTION C

**Answer ANY FOUR of the following questions** **(4 x 3 = 12 marks)**

12. Explain base register address mode
13. Explain different Auxiliary Memory types
14. Explain 2's complement addition and 2's complement subtraction.
15. Explain address sequencing
16. What is the general register organization?
17. Explain the register indirect mode.

#### SECTION D

**Write an essay on ANY TWO of the following questions** **(2 x 5 = 10 marks)**

18. Explain the fixed point and floating point representation
19. Explain the direct memory access in detail.
20. Explain different addressing modes.
21. Write a detailed note on instruction cycle describing the various steps involved.

# 3B07BCA

## INTRODUCTION TO MICROPROCESSORS

**Hours per Week : Theory - 4**

**Credit: 3**

**Objectives :**

- Familiarize with 8085 architecture.
- Familiarize with 8086 architecture.
- Skill in writing assembly language programs.
- Understand Interrupts and DMA techniques.

### **Module I**

Introduction: History of Microprocessors, Introduction to 8-bit microprocessor - 8085, Architecture of 8085, Bus organization of 8085, Internal Data Operations and 8085 registers.

### **Module II**

Introduction to 16-bit microprocessor – 8086, Architecture of 8086, Functional Block Diagram, Register Organization of 8086, Signal Description of 8086, Physical Memory Organization, Memory Mapped and I/O Mapped Organization, General Bus Operation, I/O Addressing Capability, Minimum and Maximum Mode 8086 System and Timings.

### **Module III**

Addressing Modes of 8086, Machine Language Instruction Format, Assembly Language Programming of 8086, Instruction Set of 8086-Data transfer instructions, Arithmetic and Logic instructions, Branch instructions, Loop instructions, Processor Control instructions, Flag Manipulation instructions, Shift and Rotate instructions, String instructions, Assembler Directives and operators.

### **Module IV**

Introduction to Stack, STACK Structure of 8086, Interrupts and Interrupt Service Routines, Interrupt Cycle of 8086, Non-Maskable and Maskable Interrupts.

### **Module V**

Data transfer schemes – Programmed IO, Interrupt driven IO and DMA. Programmable Peripheral Interface 8255, DMA Controller 8257, Programmable Interrupt Controller 8259A

### **Text Book**

Advanced Microprocessors and Peripherals – Architecture, Programming and Interfacing by A.K. Ray and K.M. Bhurchand, Tata McGraw Hill, 2002 Edition

### **Reference Books**

1. Microprocessors and Interfacing – Programming and Hardware by Douglas V Hall, 2nd Edition, Tata McGraw Hill, 2002.

## Model Question Paper

### 3B07BCA INTRODUCTION TO MICROPROCESSORS

Time: 3 Hrs

Max. Marks: 40

#### SECTION A

1. One word answer

(8 x 0.5 = 4 marks)

- a) The 8086 microprocessors has \_\_\_\_\_ clock rates.
- b) Data Segment register is used to store \_\_\_\_\_
- c) \_\_\_\_\_ instruction effects only carry flag.
- d) The \_\_\_\_\_ directive is used to reserve bytes of memory locations in available memory.
- e) The \_\_\_\_\_ has the highest priority among external interfupts.
- f) Division by zero generates \_\_\_\_\_ interrupt.
- g) The normal time taken by memory read cycle is \_\_\_\_\_
- h) 8085 has \_\_\_\_\_ general purpose registers.

#### SECTION B

Write short notes on ANY SEVEN of the following questions

(7 x 2 = 14 marks)

2. How DMA is initiated?
3. What is indexed addressing?
4. Compare macro and subroutines.
5. What is an external interrupt?
6. What is an assembler directive?
7. What is a register addressing mode?
8. What is the difference between CALL and INT instruction.
9. List the features of 8259.
10. What is the use of ALE signal?
11. What is the difference between segment register and general purpose registers.

#### SECTION C

Answer ANY FOUR of the following questions

(4 x 3 = 12 marks)

12. How interrupts are handled by 8086.
13. Explain handshaking in 8222
14. What are asynchronous counters.
16. Compare maskable and nonmaskable interrupts
17. Explain the architecture of an 8086 microprocessor.

#### SECTION D

Write an essay on ANY TWO of the following questions

(2 x 5 = 10 marks)

18. Discuss addressing modes in 8086.
19. Describe the register organization of 8086
20. Explain the memory organization, memory mapping and memory related data transfer in 8086.
21. List and explain the different types of interrupts in 8086. Explain instructions related to interrupt subroutines.

## SEMESTER IV

### 4A14BCA NUMERICAL ANALYSIS

Hours per Week: Theory - 4

Credits: 4

#### **Objectives:**

- To expose students to computer-based numerical solutions.
- To impart basic theoretical knowledge underpinning numerical solutions to the following problems and also to provide an opportunity to apply programming skills

#### **Module I**

Introduction to Numerical Methods: Nature of numerical problems; computer based solutions; number representations; Notions of accuracy, convergence, efficiency, complexity-Floating point representation- Error- Significant Digits- Numerical Instability- Solutions of Non-linear equations: Bisection method; Regula-Falsi; Newton-Raphson.

#### **Module II**

System of Linear Equations- Gauss elimination, Gauss Jordan elimination, Triangulation method, Iterative method, Jacobi.

#### **Module III**

Numerical Integration & Differentiation: Concept of differentiation and Integration, graphical interpretation; Cubic Spline based Numerical Differentiation; Numerical Integration: Taylors series and Eulers methods- Simpson's Romberg, Gaussian, Runge Kutta methods.

#### **Module IV**

Mathematical Logic- Statement calculus- Connectives- Normal Forms- Theory of inference for the statement of Calculus.

#### **Module V**

Graph Theory- Basic concepts- Storage representation and manipulation of graphs.

#### **Text Books**

1. V. Rajaraman, Computer Oriented Numerical Methods, 3/e, PHI
2. Balagurusamy, E., "Numerical Methods", Tata McGraw-Hill, New Delhi, 1999.
3. Discrete Mathematical Structures with Application to Computer Science- McGraw Hill

#### **References**

1. Kandasamy, P., Thilagavathy, K. and Gunavathy, K., "Numerical Methods", S.Chand Co. Ltd., New Delhi, 2003.
2. Burden, R.L and Faires, T.D., "Numerical Analysis", Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002.
3. N Datta, Computer Oriented Numerical Methods, Vikas

## Model Question Paper 4A14BCA NUMERICAL ANALYSIS

Time: 3 Hrs

Max. Marks: 40

### SECTION A

1. **One word answer**

(8 x 0.5 = 4 marks)

- a) Inverse of a matrix is defined by  $A^{-1} =$  \_\_\_\_\_
- b) The errors introduced during the implementation of a numerical method are known as .....
- c) The decimal representation of the binary number is 87.450 is \_\_\_\_\_
- d) The number of edges appearing in the sequence of a path in digraph is called.....
- e) \_\_\_\_\_ An edge of a graph which joins a node to itself is called a .....
- f) Machine dependent error is called \_\_\_\_\_
- g) The method of obtaining the derivative of a function using a numerical technique is known as \_\_\_\_\_
- h) The iterative method which has the fastest convergence is \_\_\_\_\_

### SECTION B

Write short notes on **ANY SEVEN** of the following questions

(7 x 2 = 14 marks)

2. Find the position of the smallest positive root of  $2x^2 - 9x + 9 = 0$ .
3. Solve  $x = 2y = 3$ ,  $3x - 2y = 1$  by Gauss elimination method
4. Find  $y(0, 10)$  by Taylor series method given  $y' = y = x$ ,  $y(0) = 1$  (Take  $h = 0.1$ )
5. Define a simple graph. Give an example
6. Define the concept of isomorphism in graphs. Give examples of 2 isomorphic graphs
7. Explain regula- falsi method.
8. Evaluate by Simpsons 1/3 rule taking  $h = 0.25$
9. Prove that simple digraph every node of the digraph lies in exactly one strong component.
10. Explain Lagrange's interpolation method.
11. Find inverse of A by Gauss\_Jordan Method



### SECTION C

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. Evaluate the approximate value of  $\pi$  of Newton Raphson method?
13. Explain disjunctive and conjunctive normal forms.
14. Given  $y = 1$  for  $x=0$  find  $y$  approximately for  $x=0.1$  by Eulers method.
15. Calculate by Trapezodial rule an approximate value of  $\int_0^1 x^2 dx$ .
16. Find a real root of the equation  $x^3 - 2x^2 + x - 1 = 0$  using bisection method.
17. Write algorithm for Newton Raphson  $1/3^{\text{rd}}$  method.

### SECTION D

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. Use Runge Kutta method with  $h=0.1$  to find  $y(0.2)$  given with  $y(0)=0$
19. Explain any one iteration method for solving linear equations.
20. Use Gauss Jordan method solve the system of equation  $2x-3y+4z=7$ ,  $5x-2y+2z=7$   
 $6x-3y+10z=23$ .
21. Find Lagrange's interpolation polynomial fitting the points  $f(1)=-3, f(3)=0$ ,  
 $f(4)=30, f(6)=132$  hence find  $f(5)$ .

# 4B08BCA

## OPERATING SYSTEM

**Hours per Week : Theory - 4**

**Credit: 3**

**Objectives:**

- *Introduce basic concepts of operating systems.*
- *Familiarize with features of operating systems.*
- *To expose the basics of design of operating systems.*
- *To get an overview of Linux.*

**Module I**

Concepts – Importance – Resource manager – Views – Design considerations – I/O programming – Interrupt structure and processing. (Text Book 1) Batch Processing System – Multi programming system - Time Sharing System – Real Time System. (Text book 2)

**Module II**

Processor management: Process – interacting processes - Threads – Scheduling policies – job scheduling – process scheduling – Multi processor OS. Dead locks – Dead lock handling techniques. (Text book 2)

**Module III**

Memory management: Single contiguous allocation – Partitioned allocation – Relocatable partitioned – Paging – Demand paging – Segmentation – Segmentation and demand paging – Other schemes (Text book 1)

**Module IV**

Device management: Techniques – Channels and control units – I/O traffic controller, I/O scheduler, I/O device handlers – Virtual devices. Information management: Introduction – General model - SFS – BFS – ACV – LFS – PFS – ASM . (Text book 1)

**Module V**

Unix and Linux – History; over view; Process, memory management – I/O – file system – security. (Text Book 3)

**Text Book**

1. Stuart E Madnick and John J Donovan, “Operating Systems”, Tata McGraw-Hill, 2005
2. Dhamdhere, “Systems Programming and Operating Systems”, 2<sup>nd</sup> Revised Edn, TMH
3. A. S. Tanenbaum, “Modern Operating systems”; PHI

## Model Question Paper

### 4B08BCA OPERATING SYSTEM

**Time: 3 Hrs**

**Max. Marks: 40**

#### SECTION A

**1. One word answer** **(8 x 0.5 = 4 marks)**

- a. .... is the execution of a series of jobs on a computer without manual intervention.
- b. PCB stands for \_\_\_\_\_
- c. Degree of multi programming is controlled by \_\_\_\_\_ scheduler.
- d. Bankers algorithm is used for \_\_\_\_\_
- e. Deadlocks can be described in terms of a direct graph called \_\_\_\_\_
- f. TLB stands for \_\_\_\_\_
- g. \_\_\_\_\_ is the memory management scheme that support user view of memory.
- h. \_\_\_\_\_ is the interface between user and the operating system.

#### SECTION B

**Write short notes on ANY SEVEN of the following questions** **(7 x 2 = 14 marks)**

2. Explain time sharing operating system
3. Write a note on command interpreter.
4. What is a process?
5. Write not on context switch.
6. Define deadlock.
7. Explain safe state.
8. What is swapping.
9. What is page fault.
10. Write a note on C shell.
11. What are the use of following commands : mv, rm

#### SECTION C

**Answer ANY FOUR of the following questions** **(4 x 3 = 12 marks)**

12. Write a note on Operating system components.
13. Write about various process state.
14. Write a note on thread.
15. What are the necessary condition for dead lock.
16. Explain about demand paging.
17. Write a detailed note on various types of shells.

#### SECTION D

**Write an essay on ANY TWO of the following questions** **(2 x 5 = 10 marks)**

18. Discuss in detail about scheduling algorithms.
19. Explain methods for handling dead lock.
20. Explain any four memory management schemes.
21. Explain I/O management schemes.

# 4B09BCA

## JAVA PROGRAMMING

**Hours per Week : Theory - 4**

**Credit: 3**

**Objectives:**

- To review Object Oriented Programming concepts.
- Learn features of Java programming
- To develop skill in java programming.

**Module I**

Introduction to Java programming : Java technology; history; java as a new paradigm; features of java; Applications and applets (Simple examples); Java Development Kit Java Language fundamentals : Building blocks; Data types; variable declarations; wrapper classes; Operators and assignment; control structures; arrays; strings; String buffer classes.

**Module II**

Java as an OOP Language: Defining classes; Modifiers; Packages; Interfaces.

**Module III**

Exception handling: Basics; handling exceptions in java; (Try, catch, finally, multiple catch, nested try, throw); Exception and inheritance; Throwing user defined exceptions; Advantages of exception handling. Multithreading: Overview; Creating threads; thread life cycle; Priorities and scheduling; synchronization; Thread groups; communication of threads; Sample programs.

**Module IV**

Files and I/O streams: Overview; Java I/O; file streams; FileInputStream and FileOutputStream; Filter Streams; RandomAccessFile; Serialization. Applets : Introduction; Application vs. applets; Applet lifecycle; Working with Applets; The HTML APPLET tag; the java.Applet Package; Sample programs.

**Module V**

The Abstract Window Toolkit:- Basic classes in AWT; Drawing with Graphics class; Class hierarchy; Event handling; AWT controls (Labels, Buttons, checkbox, radio buttons; choice control; list, textbox, scroll bars); Layout Managers. The menu component hierarchy; Creating menus ; Handling events from menu items ; Enabling keyboard operation ; Bringing up a popup menu ; Customizing menu layout; The Menu API

**Text book :**

1. Object Oriented Programming through JAVA, Radha Krishna, University Press.

**Reference:**

1. Programming with java: A primer, 3<sup>rd</sup> Edn; E. Balaguruswami; McGraw Hill
2. Java 2 The complete Reference, Schildt, McGraw Hill

## Model Question Paper 4B09BCA JAVA PROGRAMMING

Time: 3 Hrs

Max. Marks: 40

### Section A

1. **One word Answer** (8 x 0.5 = 4 marks)
- a) The output of Java compiler is \_\_\_\_\_
  - b) The width in bite of short data type is \_\_\_\_\_
  - c) A variable can be declared as constant in java using \_\_\_\_\_ keyword.
  - d) The variable declared as protected have access by subclass of different packages.  
Say true or false.
  - e) All exceptions are subclasses of built in class \_\_\_\_\_
  - f) You can create thread in Java by implementing \_\_\_\_\_ interface.
  - g) \_\_\_\_\_ is the default layout manager.
  - h) \_\_\_\_\_ is the method used to get number of items in a choice control.

### SECTION B

Write short notes on **ANY SEVEN** of the following questions (7 x 2 = 14 marks)

2. How to create and use an one dimensional array in Java?
3. Define an applet.
4. Explain how to declare an object and define a class.
5. Syntax of try \_\_\_\_\_ catch statement with multiple catch.
6. Short note on thread groups.
7. Explain APPLETTAG tag.
8. Write about any two methods of button class.
9. Short note on DatabaseMetaData object.
10. Short note on StringBuffer class
11. Explain any two string operations in Java

### SECTION C

Answer **ANY FOUR** of the following questions (4 x 3 = 12 marks)

12. Write a Java program to illustrate single level inheritance.
13. Short note on Thread Priorities in Java.
14. Write an overview of filter streams in Java.
15. What do you mean by event listeners in Java?
16. What are the advantages of inheritance in programming?
17. Explain exception handling in Java.

### SECTION D

Write an essay on **ANY TWO** of the following questions (2 x 5 = 10 marks)

18. Write a program to matrix multiplication.
19. Explain how to create and use statement object in Java.
20. What is the purpose of throw statement in java?
21. Write a Java program to create a thread by extending thread class.

# 4B10BCA

## LINUX ADMINISTRATION

**Hours per Week : Theory - 4**

**Credit: 3**

### **Objectives**

- *Introduce Linux working environment*
- *Understand how to install and configure Linux*
- *Learn how to write shell scripts*

### **Module I**

Features and benefits of Linux- basic concepts of multi user system-open source, freedom-Linux-components of Linux, types of users in Linux, types of files.Introduction- login, password, creating an account, shell and commands, logout,changing password- files and directories-pathname-directory tree-current working directory-referring home directory-creating new directories,copying files,moving files,deleting files and directories- types of shell-wild cards-hidden files- looking at files: cat, more-online help:man.

### **Module II**

Vi editor-different modes-command mode, insert mode, last line mode- redirecting input/output-filter, pipes, file permissions, user, group, changing file permissions - mounting floppy,HDD, CDROM-file systems-structure of /etc/fstab- Bourne shell scripts: script execution-variables and parameters, if, for, case, while constructs.

### **Module III**

Linux Administration: Introduction-various parts of the OS-kernel, system program, application program, system calls-important parts of the kernel. Boot process: booting-LILO boot process,/etc/lilo.conf, GRUB, /etc/grub.conf-runlevels-GUI,X windows- rc files, startup scripts.

### **Module IV**

Major services in linux system : init,/etc/inittab file -login from terminal3, syslog-periodic command execution: at and cron, crontab fileSystem configuration files:/etc/sysconfig/.....files,keyboard,mouse etc. System security: password,/etc/passwd file-shadow password,/etc/shadow-file permissions, chmod and umask-adding and deleting users-host security, tcp wrappers,/etc/host.allow, /etc/host.deny.

### **Module V**

System Maintenance: tmpwatch-logrotate-basic system backup and restore operation-Basic shell configuration for bourne and bash shell : /etc/profile,~/.bashrc,~/.bash\_profile.Linux Installation : Partitioning, MBR, SWAP, filesystem managing-different packages, rpm-installation of packages-starting and stopping different services.

### **Text book**

1. Unix Shell Programming, Yeshwanth kanethkar

### **Reference:**

- 1 Unix in a nut shell,by Daniel Gilly, O'Reilly & Associates
- 2 Linux Administration handbook, Nemeth, PHI

- 3 Essential System Administration, O'reilly & Associates.
- 4 Red Hat linux Bible
- 5 A user guide to the unix system, Thomas,Yates Tata McGraw Hill

## Model Question Paper 4B10BCA LINUX ADMINISTRATION

**Time: 3 Hrs**

**Max. Marks: 40**

### SECTION A

**1. One Word Answer**

**8 x 0.5=4 marks**

- a) The command used to rename a file in Linux is \_\_\_\_\_
- b) What is the PID of the Kernel process?
- c) The default run level with GUI in Linux is \_\_\_\_\_
- d) \_\_\_\_\_ process is termed as the parent of all process in Linux
- e) GRUB stands for \_\_\_\_\_.
- f) Name the directory that stores system configuration files in Linux
- g) The GUI of Linux is termed as \_\_\_\_\_.
- h) \_\_\_\_\_ command is used to switch one runlevel to another

### SECTION B

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. What are the procedure for adding new users in Linux
3. Write a note on X window system
4. How shadow password provides additional security to Linux users?
5. What are the contents of /etc/grub.conf file?
6. Explain the output of ls -l command.
7. How to schedule a job using cron.
8. Explain system log messages
9. How to compress a file in Linux?
10. How to manage process in Linux using ps command?
11. Write a note on shell configuration files

### SECTION C

**Answer ANY FOUR of the following questions**

**(4 x 3 = 12 marks)**

12. Write a shell program to find whether a number is odd or even
13. What are runlevels?. Explain briefly
14. What are the seven types of files supported by Linux OS.
15. How the host based security is achieved in Linux
16. Write a note on kernel module management
17. How to mount and unmount file systems in Linux

### SECTION D

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. What are the features of Linux Operating system
19. Explain briefly how the back up and restore operations can be done in Linux.
20. What are the basic permissions available to files in Linux? How to set that using Linux? How we can change that permissions?
21. Explain briefly the steps in installing Linux OS

## **4B11BCA Lab-III**

### **Data Structure & DBMS**

**Credit: 3**

The lab consist of two sections, Section A : Data structures and Section B : DBMS. Equal weightage will be given for both sections. For internal assessment, each part may be evaluated independently and final CA grade shall be obtained by combining them. End semester examination question shall carry questions from both sections.

#### **Section A : Data Structures**

A list of twenty programs is given below. Each student has to complete and record a minimum of 15 exercises. A detailed problem statement shall be prepared by the faculty concerned.

1. Recursion -Tower of Hanoi problem.
2. Delete and insert elements from an array.
3. Add two polynomials.
4. Add two sparse matrices.
5. Sequential and binary search : Print number of comparison in each case for given datasets.
6. Insertion sort.
7. Bubble and selection sort : Print number of comparisons and exchanges in each case for given data sets.
8. Quick sort.
9. Merge sort.
10. Conversion of infix expression to postfix.
11. Evaluation of postfix.
12. Menu driven program : to add / delete elements to a circular queue. Include necessary error messages.
13. Singly linked list operations : add a new node at the beginning, at the end, after  $i^{\text{th}}$  node, delete from beginning, end, print the list.
14. Singly linked list operations: Search list, merge two list and count number of nodes.
15. Circular linked list : add a new node at the beginning, at the end, after  $i^{\text{th}}$  node, delete from beginning, end, print the list.
16. Doubly linked list : add a new node at the beginning, at the end, after  $i^{\text{th}}$  node, delete from beginning, end, print the list.
17. Use a linked stack to reverse a string.
18. Implement tree traversal.
19. Create a binary search tree out of given data and traverse it inorder.
20. Merge two sorted linked list.



## Section B: DBMS

Minimum 10 exercises covering SQL related topics . Sample exercises are given below:

### SQL -1

- Create a sequence named 'star' to be used with student tables primary key column-sno. The sequence should start with 10 & max value 99
  - Create table students with fields sno, sname, sex, mark with sno as primary key and assign suitable constraints for each attribute.
  - Insert five records into the table.
1. Alter the table by adding one more field rank.
  2. Display all boy students with their name.
  3. Find the Average mark
  4. Create a query to display the sno and sname for all students who got More than the average mark. Sorts the results in descending order of mark.
  5. Display girl student name for those who have marks greater than 40 and less than 20.

### SQL -2

- Create a table department with fields ename, salary, dno, dname, place with dno as primary key.
  - Insert five records into the table.
1. Rename the field 'place' with 'city'
  2. Display the employees who got salary more than Rs.6000 and less than 10000 /-
  3. Display total salary of the organization
  4. Display ename for those who are getting salary in between 5000 and 10000.
  5. Create a view named 'Star' with field ename, salary & place
  6. display ename and salary, salary rounded with 10 digits\*\*'

### SQL -3

- Create a table department with fields dno, dname, dmanager and place with dno as primary key.
  - Create a table emp with fields eno, ename, job, dno, salary, with eno as primary key. Set dno as foreign key.
  - Insert five records into each table.
1. Display the ename and salary, salary with ascending order
  2. Display ename and salary for eno=20,
  3. Display the manager for the accounting Department
  4. Display the name,salary and manager of all employees who are getting salary > 5000
  5. Write the queries using various group functions.
  6. Write the queries using various Number functions.

### SQL -4

- Create a sequence to be used with the Emp Table's primary key column. The Sequence should start at 60 and have a maximum value of 200. Have your sequence increment by 10 numbers.

- Create a table emp with fields eno ,ename, job, manager, salary, with eno as primary key.
  - Insert values into the table.
1. Display ename, salary from emp who are getting salary more than average salary of the organization.
  2. ADD 20% DA as extra salary to all employees. Label the coloumn as 'New Salary'
  3. Create a query to display the eno and ename for all employees who earn more than the average salary. Sort the results in descending order of salary.
  4. Create a view called emp\_view based on the eno, ename from emp table change the heading for the ename to 'EMPLOY'.
  5. Write a query that will display the eno and ename for all employees whose name contains a 'T'.
  6. Write a script to display the following information about your sequences. Sequence name, maximum value, increment size and last number.

#### SQL -5

- Create a table department with fields dno, ename,salary, Designation,dname,place with dno as primary key.
  - Insert values into the table.
1. Write the queries using various Character functions in ename field.
  2. Create a query to display the employee number and name for all employees who earn more than the average salary. Sort the results in descending order of salary.
  3. Display all employees who got salry between 5000 &10000
  4. Display ename, salary, Designation for those who got salary more than 5000 or his Designation is 'clerk'.
  5. Display Ename and designation those who are not a clerk or manager.
  6. Display the names of all employees where the third letter of their name is an 'A'

#### SQL -6

- Create a table Customer with fields cid, cname, date\_of\_birth,place
  - Create table loan with fields loanno,cid,bname assigning suitable constraints.
  - Create table depositor with fields accno, cid, balance, bname assigning suitable constraints.
  - Insert 5 Records in to each table.
1. Add one more field amount to loan table. Update each record. Display cname for cid=2.
  2. Calculate Rs 150 extra for all customers having loan.The added loan amount will display in a new coloumn.
  3. Display loanno, cname and place of a customer who is residing in Kannur city.
  4. Display all information from loan table for loanno 2,8,10.
  5. Display all customers who have both loan and deposit.

## **4B12BCA LAB – IV**

# **JAVA PROGRAMMING, SHELL PROGRAMMING AND LINUX ADMINISTRATION**

**Hours per Week: Practical - 5**

**Credits: 3**

The lab consist of two sections, Section A : Java Programming B : Linux Administration. Equal weightage will be given for both section. For internal assessment, each part may be evaluated independently and final CA grade shall be obtained by combining them. End semester examination question shall carry questions from both sections.

- Practice **all** the programs in the lab
- Include all programs from part A and minimum 10 from part B in practical record.

### **Section A : Java Programming**

1. Write a java program to perform various string operations using java class.
2. Write java program to implement interface.
3. Write java program that handles various exceptions. Use try –catch statement.
4. Write java program to implement file I/O operation using java iostreams.
5. Write java program to implement Applet life cycle.
6. Write java program to implement a calculator using suitable AWT controls.
7. Write java program to implement menus and popup menus
8. With API suport write demo programs for menu display
9. Write a java program to demonstrate threads.
10. Demonstration of FileInputStream and FileOutputStream Classes

### **Section B: Shell Scripts and Linux Administration (minimum 10)**

1. Shell Script Program to perform all Arithmetic operations
2. Shell Script Program to find simple interest
3. Shell Script Program to find Area of Square, Rectangle, Circle
4. Shell Script Program to print your Address 'n' times
5. Shell Script Program to find whether number is even or odd
6. Shell Script Program to find whether number is +ve, -ve or 0

7. Shell Script Program to find Greatest of 3 numbers
  8. Shell Script Program to whether year is Leap year or not
  9. Shell Script Program to print natural numbers from 1 to 10 using WHILE loop
  10. Shell Script Program to print perfect numbers from 1 to 100
  11. Shell Script Program to reverse a number
  12. Shell Script Program to find whether the given number is perfect or not
- Linux installation, upgradation and rescue.
  - Boot loader configuration using GRUB
  - Managing the run level.
  - Starting and stoping services in runlevel.
  - The service command
  - Manging process- viewing status, killing , restarting etc using ps.
  - Adding and deleting user accounts, changing passwords.
  - Changing the environment variables like PATH
  - Scheduling jobs using cron
  - Managing kernel modules
  - Mounting and unmounting external file systems
  - Setting the value of umask, changing the permissions, changing owner and groups
  - Installation and removal of packages
  - Installation of a peripheral devices (e.g printer)
  - Archiving and Backup using tar. Restoring backup
  - Compressing and uncompressing files using any one tool

## **SEMESTER V**

# **5B13BCA SOFTWARE ENGINEERING**

**Hours per Week : Theory - 4**

**Credit: 3**

**Objectives :**

- *Understand the basic processes in software Development life cycle.*
- *Familiarize with different models and their significance.*
- *Approach software development in a systematic way.*
- *To familiarize students with requirement engineering and classical software design techniques.*
- *To familiarize with various software testing techniques and tools.*

### **Module 1:**

Introduction to software engineering-Definition, program versus software, software process, software characteristics, brief introduction about product and process, software process and product matrices; Software life cycle models – Definition, waterfall model, increment process model, evolutionary process model, selection of the life cycle model.

### **Module 2:**

Software Requirement Analysis and Specification – Requirements engineering, types of requirements, feasibility studies, requirement elicitation, various steps of requirement analysis, requirement documentation, requirement validation.

### **Module 3:**

Software design – definition, various types, objectives and importance of design phase, modularity, strategy of design, function oriented design, IEEE recommended practice for software design descriptions.

### **Module 4:**

Objected Oriented Design – Analysis, design concept, design notations and specifications, design methodology.

### **Module 5:**

Software Testing – What is testing, Why should we test, who should do testing? Test case and Test suit, verification and validation, alpha beta and acceptance testing, functional testing , techniques to design test cases , Boundary value analysis, equivalence class testing, decision table based testing; structural testing , path testing , Graph matrices , Data flow testing , levels of testing ,unit testing , integration testing , system testing , validation testing

**Text Book:**

1. Software Engineering (Third Edition), K K Aggarwal, Yogesh singh, New age International Publication (For unit 1,2,3,5 and case study of unit 4)
2. An integrated approach to software Engineering (Second Edition ), Pankaj Jalote , Narosa Publishing House - (For Unit 4 )

**References:**

1. Software Engineering (Seventh edition), Ian Sommerville – Addison Wesley
2. Software Engineering A practitioners approach (Sixth Edition), Roger S Pressman - Mc Graw Hill.
3. Fundamentals of Software Engineering (Second Edition), Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli - Pearson Education

## Model Question Paper 5B13BCA SOFTWARE ENGINEERING

**Time 3 Hours****Max.Marks:40****SECTION A****1. One word answer****(8 x 0.5 = 4 marks)**

- a) \_\_\_\_\_ is the way in which we produce software.
- b) Expansion of CASE is \_\_\_\_\_
- c) Level 0 DFD is also called \_\_\_\_\_
- d) FAST stands for \_\_\_\_\_
- e) X and Y have no conceptual relationship other than shared code then the cohesion is called \_\_\_\_\_
- f) UML stands for \_\_\_\_\_.
- g) \_\_\_\_\_ is the process of executing a program with the intension of errors.
- h) \_\_\_\_\_ is the process of confirming that software meets the customers requirements.

**SECTION B****Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. What is software process?
3. What is product matrices?
4. Write a note on SRS.
5. What is requirement validation?
6. Define Software design.

7. What is bottom up strategy of design?
8. What are the steps to analyze and design Object Oriented System?
9. Write a note on Abstraction.
10. What is test case and test suite?
11. Define white box testing.

### **SECTION C**

**Answer ANY FOUR of the following questions**

**(4 x 3 = 12 marks)**

12. What are the important software characteristics?
13. Discuss about requirement elicitation.
14. Write a note on types of design.
15. What are the basic concepts of Object Oriented Design.
16. Write a note evolutionary data model.
17. Write a note on various levels of testing..

### **SECTION D**

**Write an essay on ANY TWO of the following questions**

**(2 x 5 = 10 marks)**

18. Discuss Waterfall model in detail.
19. Explain various steps of requirement analysis.
20. Write a note on Module Coupling.
21. Explain various techniques to design test cases..

## 5B14BCA

# DATA COMMUNICATION & NETWORKS

**Hours per Week : Theory - 4**

**Credit: 3**

**Objectives :**

- *Understand the basics of data communication*
- *Familiarize with OSI reference model*
- *To familiarize students with layers of communication model*
- *To introduce concepts of network security*

**Module I**

Introduction to data communication, important elements /components of data communication, Data transmission- Analog, Digital. Transmission media- Guided media, Unguided media. Synchronous / Asynchronous data transmission. Line configuration – Simplex, Half duplex, Duplex. Network topologies – star, Bus, ring, Mesh. Computer networks, Use, network hardware, network structure- point to point connection, multicast, broadcast, classification of networks-LAN, WAN, Man. Network software – protocol hierarchies. design issues for layers, interfaces and services- connection oriented, connection less.

**Module II**

Reference models, the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / Ip models. Data Link Layer , Design issues, Services to network layer, Framing- character count, character stuffing, bit stuffing, physical layer coding violation. Error control, flow control, Elementary data link protocols- unrestricted simplex protocol, simplex stop and wait protocol, simplex protocol for a noisy channel.

**Module III**

Network layer, design issues, services to the transport layer, routing algorithms- adaptive, non adaptive algorithms, optimality principle, dijkstras shortest path routing algorithm, flow based routing, hierarchical routing, congestion control algorithms – the leaky bucket algorithm, the token bucket algorithm.

**Module IV**

Transport layer, design issues, connection management-addressing, establishing and releasing connection, transport layer protocols- TCP, UDP

**Module V**

Application layer, network security, traditional cryptography, substitution ciphers, transposition ciphers, fundamental principles, secret key algorithm, data encryption standard, DES chaining, DES breaking. Public key algorithm, RSA algorithm.



**Text books**

1. A S Tanenbaum . Computer Networks TMH

**References**

1. B Forousan, Introduction to data communication and networking
2. Data communication and Networks, Achyut S. godbole, TMH
3. Computer Networks – fundamentals and Applications, Rajesh, Easarakumar & Balasubramaian, Vikas pub.

## Model Question Paper

### 5B14BCA DATA COMMUNICATION & NETWORKS

**Time 3 Hours****Max.Marks:40****SECTION A****1. One Word Answer****(8 X 0.5 = 4 marks)**

- a. The transfer of data in the form of electrical signals or continuous waves is called \_\_\_\_\_.
- b. The \_\_\_\_\_ is in between each pair of adjacent layers and defines the primitive operations and services of the lower layer.
- c. The \_\_\_\_\_ protocol has neither flow control nor error control.
- d. The network layer deals with \_\_\_\_\_ transmission.
- e. The coding of data for security is called \_\_\_\_\_.
- f. In TCP the connection is established using a technique called \_\_\_\_\_.
- g. OSI stands for \_\_\_\_\_.
- h. The hierarchical routing uses the idea of dividing routes called \_\_\_\_\_.

**SECTION B****Write short notes on ANY SEVEN of the following questions (7 X 2 = 14 marks)**

2. What are the design issues of network layer?
3. What is meant by congestion?
4. What is cryptography?
5. List the file transfer protocols?
6. What is the need of error control?
7. What is meant by character stuffing?
8. Explain simplex transmission?
9. Define a computer network.
10. What is meant by parallel transmission?
11. What is service point addressing?

**SECTION C**

**Write short notes on ANY FOUR of the following questions (4 X 3 = 12 marks)**

12. Explain transposition ciphers.
13. Compare between TCP and UDP.
14. Explain flow based routing.
15. Explain Framing.
16. .What are the functions of presentation layer?
17. Briefly explain unicast, muticast and broadcast.

**SECTION D**

**Write short notes on ANY SEVEN of the following questions (2 X 5 = 10marks)**

18. Explain ISO-OSI reference model.
19. List and explain elementary protocols used in DLL.
20. Explain different types of routing.
21. Explain the various methods for providing network security.

# 5B15BCA

## ENTERPRISE JAVA PROGRAMMING

**Hours per Week : Theory - 4    Practical – 4**

**Credit: 3**

### **Objectives**

- 1 *To understand the Enterprise Java platform*
- 2 *To provides an API and runtime environment for developing and running large-scale*
- 3 *To develop programming skills in multi-tiered, scalable, reliable, and secure network application*

### **Module I**

Java Database Connectivity: JDBC architecture; Drivers, JDBC-ODBC bridge, native API partly java driver, Net Protocol all Java driver, Native protocol all Java driver; Connecting to Database; statements; Multiple result sets; Large data types; Handling Errors; SQL warning; Metadata, database meta data, result set meta data

### **Module II**

Remote Method Invocation: RMI architecture; RMI Object services; Naming/registry service, object activation service, distributed garbage collection; Defining Remote objects; Key RMI classes for remote object implementations; Stubs and skeletons; Accessing remote object as a client; Remote method arguments and return values; Factory classes; Dynamically loaded classes; Configuring clients and servers for remote class loading;

### **Module III**

Java Servlets: Life cycle; HTTP Servlets, forms and interaction; POST, HEAD and other requests; Servlet responses; Servlet requests; Error handling, status codes; Servlet chaining; Custom Servlet Initialisation; Thread safety; Server side includes; Cookies; Session tracking

### **Module IV**

Common Object Request Broker Architecture: Introduction to CORBA, About Object management group, CORBA architecture, architectural similarities, CORBA versus Java RMI, CORBA services, CORBA facilities-Vertical CORBA facilities, Horizontal facilities. CORBA domains. IDL Compiler, Interface definition language, IDL stub, IDL Skelton interface , Repositories, Object request broker; Naming service;

### **Module IV**

Inter-ORB communication; Creating CORBA objects; IDL, modules, interfaces, data members and methods; IDL and Java; Simple server class, helper class, holder class, client and server stubs; Initializing ORB, Registering with a naming service; Adding objects to a naming context; Finding remote objects; Initial ORB references;

### **Reference:**

- Java Enterprise in a nutshell by David Flanagan and Jim Parley, O'Reilly Associates

## Model Question Paper

### 5B15BCA ENTERPRISE JAVA PROGRAMMING

Time: 3 Hrs

Max. Marks: 40

#### SECTION A

**1. One word answer**

(8 x 0.5 = 4 marks)

- a) The \_\_\_\_\_ package is imported when working with JDBC.
- b) The method Class.forName() throws the \_\_\_\_\_ exception.
- c) CORBA stands for \_\_\_\_\_
- d) CLOB means \_\_\_\_\_
- e) The \_\_\_\_\_ method of the class Statement is used to get a single result set from a select query.
- f) In Java tables are manipulated as \_\_\_\_\_
- g) RMI stands for \_\_\_\_\_
- h) ORB means \_\_\_\_\_

#### SECTION B

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. What is SQL exception?
3. What are Factory classes?
4. What are cookies?
5. What is CORBA?
6. What are the packages used in a servlet API?
7. What is RMI?
8. What are BLOB and CLOB?
9. List the different kinds of statements in JDBC.
10. What is an Activatable Remote Object?
11. What is IDL?

#### SECTION C

**Answer ANY FOUR of the following questions**

(4 x 3 = 12 marks)

12. What are activation groups?
13. Describe Java classes generated in an IDL interface.
14. What is a CORBA naming service?
15. Explain resource abstraction.
16. Describe servlet chaining.
17. Explain error handling in servlets

#### SECTION D

**Write an essay on ANY TWO of the following questions**

(2 x 5 = 10 marks)

18. With suitable examples explain Database MetaData and ResultSetMetaData.
19. Describe the elements of the Servlet API.
20. Explain the RMI architecture, with a diagram.
21. Explain the CORBA facilities.

## 5B16BCA

# C# AND .NET PROGRAMMING

Hours per Week : Theory - 3 Practical - 4

Credits : 2

### **Objectives**

- To expose students to current trends and styles in programming
- To familiarize simple, modern, general-purpose, object-oriented programming language.

### **Module I**

Introduction to C# - Evolution , Characteristics, applications.Understanding .NET-Origin of .NET Technology, .NET Framework, Common Language Runtime (CLR), .NET Approach. Overview of C#- Program Structure, A Simple C# Program, Namespaces, CommandLine Argument, Errors.

### **Module II**

Basic concepts of Programming: Literals, Variables, Boxing and Unboxing, Data types, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

### **Module III**

Object Oriented aspects of C# ,Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions, Multithreading.

### **Module IV**

Application Development on .NET Web Applications – Web form Fundamentals, Web form Events, Webform Life cycle, Creating a Web Application, Web Srvices. Windows Applications – Creating a Windows Application.

### **Module V**

Database Access and .NET Components Accessing Data with ADO.NET Assemblies, Versioning, Attributes, Reflection, Viewing Meta Data, Type Discovery, Reflecting on a type, Marshalling, Remoting.

### **Text Books**

1. Programming in C#, E.Balagurusamy (Unit I, II)
2. Programming in C#, J. Liberty 2<sup>nd</sup> Edition – O'Reilly (Unit III, IV, V)

**Reference**

- 1 C# Programming Bible, Jeff Ferguson, Brian Patterson, Jason Beres, Wiley Publishing Inc., Reprint 2006.
- 2 Programming .Net , Jeff Prosize, , 2nd Edition, WP Publishers & Distributors Pvt. Ltd, 2009.
- 3 Professional .Net Framework , Kevin Hoffman & Jeff Gabriel, , 1<sup>st</sup> Edition, Wrox Press Publishers, 2006.

**Model Question Paper****5B16BCA C# AND .NET PROGRAMMING****Time: 3 Hours****Max Mark: 40****SECTION- A****1. One Word Answer****(8\*0.5= 4 Marks)**

- a. C# is known as the first ..... language
- b. MSIL means .....
- c. .NET framework is one of the tools provided by .....
- d. An inherent characteristic of IL code is .....
- e. Value constant assigned to variable in a program is known as .....
- f. The ability to take more than one form is known as .....
- g. for is a ..... control loop.
- h. Web pages can have both HTML and ..... controls

**SECTION- B****Write short notes on ANY SEVEN of the following questions****(7\*2=14 Marks)**

2. What is .NET Framework?
3. What is Common Type System?
4. What is method overloading?
5. What are arithmetic expressions?
6. What is Web Services?
7. What is .NET Assembly?
8. What is reflection?
9. What are Compile time errors?
10. What is containment inheritance?
11. State at least five most important highlight of c# language

**SECTION - C****Answer ANY FOUR of the following questions****(4\*3=12 Marks)**

12. Discuss Enumeration with example?
13. Describe the structure of typical c# program.
14. What are private and shared assemblies?
15. Discuss differences between class and structure with example.
16. How does C# differ from Java ?
17. Explain webform events.

**SECTION- D****Answer ANY TWO of the following questions****(2\*5=10 Marks)**

18. Explain the steps to develop a web application with a simple example.
19. Explain Webform life cycle.
20. Explain CLR and its Components.
21. Explain ADO .NET

## SEMESTER VI

# 6B17BCA WEB TECHNOLOGY

Hours per Week : Theory – 2

Credits : 2

### *Objectives*

1. To enable students to program for the World Wide Web using HTML, JavaScript, PHP and MySQL.
2. To create static and dynamic web pages PHP and My SQL.
3. To impart basic knowledge in relational databases, SQL and , Client-server model.

### **Module -1:**

Introduction to internet and web, An overview of internet programming –WWW design issues. Introduction to HTML-structure of HTML,tags,attributes,syntax of tags ,starting and ending tags,html doc elements-<html>,<title>,<body>,physical style tags,listing,labeling,grouping, <img>-<a>

### **Module-2:**

Table tags-<tr>,<td>,<th> attributes-height,width,rowspan,colspan, border,color. Form-tagattributes-type-passwd,submit,radio,check,method,action.Frame-<frame>,<frameset> , <iframe>,<noframe> and other important tags and attributes.

### **Module-3**

Javascript-datatypes,variables,function,object,array.Client-side object hierarchy and document.object Model,<script>,event handlers,javascript in urls.Windows and frames-dialog boxes,status line,navigator object,opening Windows,closing windows,Location object,history object.- Date object- math object- Accessing form object.

### **Module-4:**

Intro to PHPand advantages of ,PHP basic-functions,string,array,object,web techinniques, database.

### **Module-5**

Client-server model, introduction to cgi,environment variables, request-response model, encoding and decoding form data. Simple programming in CGI- databse.

### **Text Books:**

- 1.HTML-Definitive Guide O'reilley
- 2.Programming in PHP O'reilley
- 3.Programming in CGI O'reilley
- 4.Javascript-Definitive Guide O'reilley

### **Reference:**

- 1.Complete reference in PHP-Steven Hozner
- 2.Beginning PHP5 (Wrox Programer)
- 3.Complete reference HTML-Tata McGraw Hill



## Model Question Paper 6B17BCA WEB TECHNOLOGY

Time: 3 Hrs

Max. Marks: 40

### SECTION A

1. Answer the following questions in one word

(8 x 0.5 = 4 marks)

- a. WWW stands for .....
- b. Which tag is used for labeling?
- c. action is an attribute of .....tag.
- d. The tag used to make hyper link is .....
- e. Which tag is used to embed javascript codes within HTML page?
- f. The dialog box used for getting some input from the user is created using .....
- g. HTML stands for.....
- h. The statement used to print in PHP is .....

### SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Write a note on WWW.
3. What is the structure of an HTML document?
4. What is meant by a form? What are the important attributes of <form> tag?
5. Write a note on Javascript.
6. Explain arrays in JavaScript.
7. What is meant by events and event handlers?
8. What is meant by DOM?
9. What is meant by client server model?
10. Write the code for inserting an image to the web page.
11. What are the different methods to access databases from PHP?

### SECTION C

Answer ANY FOUR of the following questions

(4 x 3 = 12 marks)

12. Differentiate between Get and Post.
13. Explain functions in PHP.
14. What are the different types of flow control statements in PHP?
15. List and explain any four physical style tags with examples.
16. What are the different types of dialog boxes?
17. What is meant by relational databases?

### SECTION D

Write an essay of ANY TWO of the following questions

(2 x 5 = 10 marks)

18. What is the importance of HTTP in web? Explain the HTTP request response cycle.
19. What is meant by Table? What are the tags used for table creation? What are the different attributes? Illustrate with an example.
20. Design an application form with suitable controls and buttons. Make it dynamic using scripts.
21. Design a webpage for your college with frames, images and suitable hyper links.

# 6B18BCA

## DATA MINING & DATA WAREHOUSING

**Hours per Week : Theory - 4**

**Credits : 3**

**Objectives**

- To expose to the students the introduction to data mining and data warehousing.
- To understand the data management aspects data pre processing model and inference considerations, complexity considerations, post processing of discovered structures visualization and online updating

**Module I**

Introduction; data warehousing – what is, Multidimensional data model, OLAP operations, warehouse schema, Data warehousing Architecture, warehouse server, Metadata, OLAP engine, data warehouse Backend Process.

**Module II**

Data mining – what is, KDD vs data mining, DBMS vs data mining, DM Techniques, issues and challenges, Applications. (Case studies) \*

**Module III**

Association rules – What is, Methods, a priori algorithm, partition algorithm, Pincer-search algorithm, FP-tree growth algorithm, incremental and Border algorithms, Generalized Association rule.

**Module IV** Clustering techniques – Paradigms, Partitioning Algorithms, k – Medoid algorithms, CLARA, CLARANS, hierarchical clustering, DBSCAN, Categorical Clustering, STIRR.

**Module V**

Decision trees – what is, tree construction principles, Best split, Splitting indices, Splitting criteria, decision tree construction algorithms, CART, ID3, C4.5, CHAID. Introduction to web, spatial and temporal data mining.

**Text book :**

1. Data Mining Techniques, A K Pujari, University press.

**Reference :**

1. J. Han, M. Kamber, “Data Mining Concepts and Techniques”, Harcourt India Pvt Ltd.
2. M. Dunham, “ Data Mining : introductory and Advanced Topics”, Pearson Pub.

## Model Question Paper

### 6B18BCA DATA MINING & DATA WAREHOUSING

Time: 3 Hrs

Max. Marks: 40

#### SECTION A

**1. One word answer**

**(8 x 0.5 = 4 marks)**

- a) \_\_\_\_ operation is also known as roll-up operation.
- b) \_\_\_\_ is also called level wise algorithm.
- c) \_\_\_\_ is the process of extracting data for warehouse from various sources.
- d) \_\_\_\_ attempts to stop growing the tree before overfitting occurs, thus avoiding Pruning phase.
- e) In \_\_\_\_ a recursive procedure is used to construct a decision tree from data.
- f) \_\_\_\_ servers support multidimensional view of data through array based data warehouse servers.
- g) \_\_\_\_ is a bridge between data warehouse and the decision support application.
- h) \_\_\_\_ produces trees with variable branches per node.

#### SECTION B

**Write short notes on ANY SEVEN of the following questions**

**(7 x 2 = 14 marks)**

2. List out the stages of KDD
3. Explain about CHAID.
4. What is a maximal frequent set?
5. What is PAM?
6. What is a border set?
7. What is CLARANS?
8. What is ROLAP?
9. Explain about data extraction.
10. How data mining is useful field of business and E-commerce?
11. Discuss about webmining.

#### SECTION C

**Answer ANY FOUR of the following questions**

**(4 x 3 = 12 marks)**

12. Discuss in detail about the concept of spatial Data mining.
13. Describe the working of Pinies search algorithm.
14. Compare the performance of CLARA with CLARANS.
15. With sufficient diagram explain about data warehouse architecture.
16. Define decision tree. Discuss about the tree construction principles.
17. Describe the working of DBSCAN algorithm.

#### SECTION D

**Write an essay on ANY TWO of the following questions**

**(2 x 5 = 10 marks)**

18. Explain k – Medoid algorithms.
19. Explain hierarchical clustering.
20. Discuss about:
  - a) Fp tree growth algorithms.
  - b) Data warehouse backend process.
21. Write notes on:    a) Categorical clustering    b) Temporal data mining algorithms.

# 6B21BCA

## SYSTEM SOFTWARE

**Hours per Week : Theory - 3**

**Credits : 2**

**Objectives :**

1. *Introduce formal language processing activities.*
2. *Basic idea of assembly language programming and role of assembler.*
3. *Insight into Design of assemblers and macro processors.*
4. *Concept of Macros and Macro pre-processors.*
5. *Overview of various aspects of compilers.*
6. *Concepts and design aspects of linkers and loaders.*

**Module I**

Introduction – Evolution – Language processing activities – Fundamentals of language processing and specification – Development tools – Data structures for language processing

**Module II**

Scanning and parsing – Elements of ALP – Assembly scheme – Pass structure of assemblers – Two pass assembler – Single pass assembler

**Module III**

Macros: Definition and call – Expansion – Nested macro calls - Advanced macro facilities – Macro preprocessor.

**Module IV**

Compiler: Compilation – Memory allocation – Compilation of expressions and control structures – Code optimization – Interpreters.

**Module V**

Linker: Design – Relocation and linking – Self relocating programs – Linker for MS DOS – Linking for Overlays – Loader – Software tools – Editor – Debug monitor – Programming environment – User interface

**Text Book:**

D M Dhamdhare, “Systems Programming and Operating Systems”, Tata McGraw-Hill

**Reference:**

John J Donovan, “Systems Programming”, Tata McGraw-Hill

## Model Question Paper 6B21BCA SYSTEM SOFTWARE

Time: 3 Hrs

Max. Marks: 40

### SECTION A

**1. One word answer**

**(8 x 0.5 = 4 marks)**

- a) \_\_\_\_\_ is a finite sequence of symbols.
- b) Mnemonic operation codes are found in \_\_\_\_\_
- c) \_\_\_\_\_ govern the information of valid lexical units in the source language.
- d) The process of isolating lexical units of a sequence is called \_\_\_\_\_
- e) The \_\_\_\_\_ direct the assembler to take certain actions during the process of assembling a program.
- f) Addresses are kept track by using a \_\_\_\_\_
- g) \_\_\_\_\_ is the semantic gap between two specifications of the same task.
- h) Intermediate code generation phase gets input from \_\_\_\_\_

### SECTION B

**Write short notes on ANY SEVEN of the following questions**

**(7 x 2 = 14 marks)**

2. What is an overlay?
3. What are macros?
4. What is an absolute loader?
5. What are the aspects of compilation?
6. What is an interpreter?
7. What are search and allocation datastructures?
8. List the tasks performed by the synthesis phase of an assembler.
9. What is Type – 0 grammar?
10. What are the fundamental steps in program development?
11. What is semantic expansion?

### SECTION C

**Answer ANY FOUR of the following questions**

**(4 x 3 = 12 marks)**

12. Explain two pass assembly scheme.
13. Explain static and dynamic memory allocation.
14. Write a note on debug monitor.
15. What is an object module? Give example.
16. Explain ambiguity in grammars with an example.
17. What are the different parameter passing mechanisms? Explain.

### SECTION D

**Write an essay on ANY TWO of the following questions**

**(2 x 5 = 10 marks)**

18. Describe about software tools.
19. Explain in detail, the tasks performed by Pass 1 of a two pass assembler.
20. What is Heap datastructure? Explain memory management in Heap.
21. Explain LL(1) parser with an example.

## **6B22BCA LAB – V**

### **ENTERPRISE JAVA PROGRAMMING**

**Credits : 3**

#### **Sample Program List**

1. Develop five demo programs that includes all the concepts of JDBC
2. Develop Three demo programs that includes all the concepts of RMI
3. Develop five demo programs that includes all the concepts of Java Servlets
4. Develop two simple demo programs that includes all the concepts of CORBA

## **6B23BCA Lab – VI**

### **.NET Programming**

**Credits : 3**

#### **Sample Program List**

**Practice all the programs in the lab.**

1. To implement output parameter and reference parameter
2. To implement the concept of indexers
3. To implement the concept of sealed class
4. To implement the concept of namespace
5. To implement the concept of interfaces
6. To implement the concept of events
7. To implement exception handling
8. To design a calculator in windows form
9. To implement data controls in windows form
10. To implement validation controls in web form

## **6B24BCA Lab – VII**

### **Web Technology**

**Hours per Week : Practical - 3**

**Credits : 2**

#### **Guidelines**

1. *Follow standard coding method*
2. *The output of the program should be neatly formatted*
3. *Practice all the programs in the lab*

#### **Sample Program list**

1. Develop an HTML page using all basic tags
2. Develop an HTML page containing all types of lists
3. Write an HTML code to insert an image into the web page. Use the attributes height, width and border. Also align some text with respect to the images
4. Create a web page giving the following train details in a tabular form with the heading Train Time Table.
5. Train name, starting place, destination, arrival and departure time and fare
6. Create an HTML page with images. Clicking on the images should lead to external documents.
7. Form Validation using Java Script
8. Create a web page for your college using frames, images and hyper links
9. Create an email registration form. Give necessary validations
10. Write a JavaScript code using arrays
11. Create a web page that illustrate the onMouseOver and onMouseOut event handlers
12. Develop an HTML page that accepts any mathematical expression, evaluates that expression and display the result of the evaluation
13. Write a Javascript program to display the current time
14. Write a Javascript program to print the prime numbers within a range
15. Write a Javascript program to show the working of alert()
16. Write a JavaScript program to find the factorial of a number.
17. Form Processing using PHP
18. Form validation using PHP
19. Storing data in MYSQL using PHP

## **6B25BCA LAB – VIII**

# **PROJECT**

**Hours per Week : Practical - 5**

**Credits : 4**

### **Project Guidelines**

The minimal phase for the project are: project search finalization and allocation, investigation of system requirement data and process Modeling system design program design, Program coding and Testing Procedures done, and system implementation procedures.

#### ***Project planning:***

The BCA Major Project is an involved exercise, which has to be planned well in advance. The topic should be chosen in the beginning of final year itself. Related reading training and discussions first internal project viva voce should be completed in the first term of final year.

#### **Selection of the project work**

Project work could be of three types.

#### **Developing solution for real life problem**

In this case a requirement for developing a computer-based solution already exists and the different stages of system development life cycle is to be implemented successfully. Examples are accounting software for particular organization, computerization of administrative function of an organization, web based commerce etc. The scope for creativity and exploration in such projects is limited but if done meticulously valuable experience in the industrial context can be gained.

#### **b) Innovative Product development**

These are projects where a clear-cut requirement for developing based solution may not exist but a possible utility for same is conceived by the proposer. An example is a Malayalam language editor with spell checker, hand written character processing.

#### **c) Research level project**

These are projects which involve research and development and may not be as structured and clear cut as in the above case. Examples are Malayalam character recognition, Neural net based speech recognizer etc. This type of projects provides more challenging opportunities to students, but at BCA level this may be a difficult choice. If any student identifies proper support in terms of guidance technology and reference from external organizations and also the supervisors are convinced of the ability of the



student(s) to take up the project it shall be permitted. The methodology and the reporting of such project could be markedly different from type (a) and is left to the proposer/external supervisor of the project.

### **Selection of team**

To meet the stated objectives, it is imperative that major project is done through a team effort. Though it would be ideal to select the team members at random and this should be strongly recommended, due to practical consideration students may also be given the choice of forming themselves into teams with three or four members. A team leader shall be selected. Team shall maintain the minutes of meeting of the team members and ensure that tasks have been assigned to every team member in writing. Team meeting minutes shall form a part of the project report. Even if student are doing project as groups each one must independently taken different modules of the work and must submit the report.

### **Selection of Tools**

No restrictions shall be placed on the students in the choice of platform / tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of tools in the evaluation of the project.

### **Selection of external organization & Guide.**

No restriction shall be placed on the student in the choice of external organization, where project work may be done, in terms of locality type (Private/ public) etc. It is the duty of the Head of Institution / Principal of the college to ensure that the aims, objectives and full project guidelines are communicated to the external organization. The guide should ideally be a postgraduate with work experience.

Students may also choose to do project in the college/institute especially product based work but in such cases the supervisors must ensure that

- (I) Industry practices are followed
- (II) the student undertake a planned visit to an IT industry with international operations to make up for the loss of experience
- (III) the service of an external guide with industry experience is obtained.

### **Project management**

Head of the Department /principal of the college should publish the list of students project topic, internal guide and external organization and teams agreed before the end of July. Changes in this list may be permitted for valid reasons and shall be considered favourably by the Head of the Department /principal of the college any time before commencement of the project. Students should submit a fortnightly report of the progress, which could be indication of percentage of completion of the project work. The students should ideally keep a daily activity book. Team meeting should be documented and same should be submitted at the end of the project work.

### **Documentation**

Three copies of the project report must be submitted by each student ( one for department library, one for the organization where the project is done , one for the external examiner and one for the student himself/herself). After affixing signature of external examiners two copies will be returned at the time of the viva which are for the external organization and for the candidate. A CD containing soft copy of the project report, source code and binaries recorded in different folders should also be submitted for the documentation in the library. The CD also should bear the name of the student , title of the project, year etc. the format for preparation of the project is standaeized from 2007 onwards. The following are the major guidelines. The final outer dimensions of the project report shall be 21cm X30 cm.the colour of the flap cover shall be light green/blue. Only hard binding should be done, with title of thesis and the words “<BRIEF TITLE> BCA Project Report 201...”displayed on the spine in 20 point , bold , Arial, as in example below. In case the title is too long, a shorter version of it may be used.

- The text of the report should be set in 12 pt , bookman , 1.5 spaced.
- Headings should be set as follows: CHAPTER HEADINGS 20 pt, Arial, Bold, All caps, Centered.
- Section Headings 14 pt Bookman old style, Bold, Left adjusted.
- Section Sub-heading 12 pt, Bookman old style.
- Title of figures tables etc are done in 12 point, Times New Roman, Italics, centered.

Content of the Project should be relevant and specify particularly with reference to the work. The report should contain the requirement specification of the work, Analysis, Design, Coding, testing and Implementation strategies done.

- Organizational overview (of the client organization, where applicable)
- Description of the present system
- Limitations of the present system
- The Proposed system- Its advantages and features

- Context diagram of the proposed system.
- Top level DFD of the proposed system with at least one additional level of expansion
- Menu Tree
- Program List (Sample code of major functions used)
- Files or tables (for DBMS projects) list. Class names to be entered for each file in OO systems.
- List of fields or attributes (for DBMS projects) in each file or table.
- Program – File table that shows the files/tables used by each program and the files are read, written to, updated, queried or reports were produced from them.
- Screen layouts for each data entry screen.
- Report formats for each report.

**Some general guidelines on documentation are:**

1. Certificate should be in the format :” **Certified that this report titled.....is a bonafide record of the project work done by Sri/Kum .....under our supervision and guidance, towards partial fulfillment of the requirement for award of the Degree of Bachelor of Computer Application (BCA) of the Kannur University**” with dated signature of internal guide, external guide and also Head of the Department/ College.
2. If the project is done in an external organization, another certificate on the letterhead of the organization is required: **“Certified that his/her report titled .....is a bonafide record of the project work done by Sri/Kum.....under my supervision and guidance, at the .....department of..... (Organization) towards partial fulfillment of the requirement for the award of the Degree of Bachelor of Computer Application of the Kannur University.**
3. Page numbers shall be set at right hand bottom, paragraph indent shall be set as 3.
4. Only 1.5 space need be left above a section or subsection heading and no space may be left after them.
5. References shall be IEEE format ( see any IEEE magazine for detail) While doing the project keep note of all books you refer, in the correct format and include them in alphabetical order in your reference list.

There shall be four components that will be considered in assessing a project work with weightage as indicated.

- Timely completion of assigned tasks as evidenced by team meeting minutes 20% or 2 marks
- Relevance of topic System study / Design of table/Individual involvement, team work and adoption of industry work culture 20% or 2 marks
- Project report Quality of project documentation (Precision, stylistics etc )/Achievement of project deliverables 30% or 3 marks
- Viva Effective technical presentation of project work 30% or 3 marks

Based on the above 4 components internal mark (10) can be awarded.

Dissertation /Project to be submitted at the end of third year shall be valued by two examiners appointed by University for the conduct of practical exam. The board of examiners shall award 40 marks based on the following components given in the table below.

| <b>External ( 80% of Total)</b>                                     |                   |              |
|---------------------------------------------------------------------|-------------------|--------------|
| <b>Components</b>                                                   | <b>% of Marks</b> | <b>Marks</b> |
| Written Synopsis/Abstract                                           | 12.5              | 5            |
| Content of the Project                                              | 12.5              | 5            |
| Quality of project work/Use of software/ tools                      | 12.5              | 5            |
| Perfection of the work<br>(Designs of tables/ Input & Output forms) | 25                | 10           |
| Live demo                                                           | 12.5              | 5            |
| Viva-Voce                                                           | 25                | 10           |
| <b>Total</b>                                                        | <b>100</b>        | <b>40</b>    |

# 5D01BCA

## PROGRAMMING WITH C

Contact Hours/Week: Theory 2 Credit: 2

### Module I

The C character set, Identifiers and keywords, Classes of Data Types, constants, variable declarations. Expressions, statements, operators and expressions: arithmetic operators, unary operators, relational operator, logical operators, assignment operator, the conditional operator. Library functions: data input and output functions like getchar(), putchar(), scanf(), printf(), gets and puts.

### Module II

Control statements: Branching: The if-else statements. Looping: The while, do-while and for loops. The switch statements, Break and continue, comma operator.

### Module III

Functions, Defining a function, accessing a function, function prototype, passing arguments to a function, Returning from a function, recursion, program structure. Storage classes: automatic, static, register and extern(global).

### Module IV

Arrays, Structure and Union : Defining an array, processing an array, passing arrays to functions, multidimensional arrays. Structure and union. Defining a structure, processing a structure. union.

### Module V

Strings: Basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat & strrev.

### Text Book :

1. ANSI C, E. Balagurusamy, 3rd edition McGraw-Hill Publication

### Reference

1. Computer Basics and c Programming, V. Rajaraman, PHI, 2008
2. Programming with ANSI and Turbo C, Ashok N. Kamthane, 1 edn, Pearson Education.
3. Let us C, Yeshvanth Kanethkar, 3rd Edn, BPB,
4. Programming with C in Linux, NIIT, PHI.
5. C by Example, Noel Kalicharan, Cambridge University press.

## Model Question Paper 5D01BCA PROGRAMMING WITH C

Time: 2 Hrs

Max. Marks: 20

### SECTION A

1. **Answer in one word** **(8 x 0.5 = 4 marks)**
- a. A for loop with no test conditions is known as ----- loop.
  - b. The function ..... is used to determine the length of a string.
  - c. For using character functions, we must include ----- header file in the program.
  - d. A function that call itself is known as a ..... function.
  - e. Break statement is used to break from a -----
  - f. Which keyword is used to declare a global variable?
  - g. Union data type allocates same memory location for all the members (True/False)
  - h. String is a -----

### SECTION B

**Write short notes on ANY THREE of the following questions** **(3 x 2 = 6 marks)**

9. Differentiate between structure and union.
10. What are C Tokens.
11. How will you read and write a character in C.
12. List and explain logical operators in c.
13. Write if statements required to find the minimum of three integers i, j and k.

### SECTION C

**Answer ANY TWO of the following questions** **(2 x 3 = 6 marks)**

14. With suitable examples, explain break and continue statements.
15. With suitable example(s), explain parameter passing techniques in c functions.
16. What is an array? Write a program to read values to an array and display the largest among them.
17. Distinguish between while and do while loops with examples.

### SECTION D

**Write an essay on ANY ONE of the following questions** **(1 x 4 = 4 marks)**

18. With suitable examples explain the following:
  1. Switch statement.
  2. Recursive function.
  3. Conditional compilation.
  4. Structure Data type
19. Explain the different data types in C.

# 5D02 BCA

## WEB TECHNOLOGY

Contact Hours/Week: Theory 2 Credit: 2

### Module -1:

Introduction to Internet and WWW, Introduction to HTML, structure of HTML, HTML elements, attributes, syntax of tags , starting and ending tags, physical style tags, listing, labeling, grouping, images and linking

### Module-2:

HTML Tables-tags-<tr>,<td>,<th> attributes. HTML Form-tag, attributes-type-passwd,submit,radio,check,method,action.

### Module-3:

Frames-<frame>, <frameset>, <iframe>,<noframe> and other important tags and attributes. Simple programs using frames.

### Module-4:

Javascript- Introduction, data types, variables, operators, functions, objects, arrays. Client-side object hierarchy and document object Model, <script>, event handlers, javascript in urls. Windows and frames-dialog boxes, status line, navigator object, opening Windows, closing windows, Location object, history object.- Date object- math object- Accessing form object.

### Module-5:

Introduction to PHP, advantages of PHP, PHP basics- operators and Flow Control, strings and arrays, creating functions.

### Text Books:

1. HTML-Definitive Guide O'reilley 5<sup>th</sup> edn
2. Javascript-Definitive Guide O'reilley 6<sup>th</sup> edn

### Reference:

1. Programming in PHP O'reilley
2. Complete reference in PHP-Steven Hozner
3. Beginning PHP5 (Wrox Programmer)
4. Complete reference HTML-Tata McGraw Hill

## Model Question Paper 5D02 BCA WEB TECHNOLOGY

**Time: 2 Hrs**

**Max. Marks: 20**

### SECTION A

**Answer in one word**

**(8 x 0.5 = 4 marks)**

1. WWW stands for .....
2. Which tag is used for labeling?
3. action is an attribute of .....tag.
4. The tag used to make hyper link is .....
5. Which tag is used to embed javascript codes within HTML page?
6. The dialog box used for getting some input from the user is created using .....
7. HTML stands for.....
8. The statement used to print in PHP is .....

### SECTION B

**Write short notes on ANY THREE of the following questions (3x 2 = 6 marks)**

9. Write a note on Javascript.
10. What is meant by events and event handlers?
11. What is the use of <noframe> tag?
12. How can you create arrays in PHP ?
13. Explain the Location object.

### SECTION C

**Answer ANY TWO of the following questions (2x 3 = 6 marks)**

14. Explain the creation of frames in HTML.
15. Write short note on the Date object.
16. List the advantages of PHP.
17. Explain the different physical style tags.

### SECTION D

**Write an essay on ANY ONE of the following questions (1 x 4 = 4 marks)**

18. Explain the creation of different types of lists in HTML with examples.
19. Different types of operators in Java Script.



# 5D03BCA

## DATABASE MANAGEMENT SYSTEM

**Contact Hours/Week: Theory 2 Credit: 2**

### Module I

Introduction–Field,Record,Entity,Attribute,Relation,Domain,Tuple-Advantages of database systems- data models (Network model, Hierarchical Model, DBTG CODASYL model, Relational Model(E-R)) - system structure.

### Module II

Database administrator- data base users, Constraints(Primary, Foreign, Candidate, Unique)- Relational Algebra (Union, Intersection, Difference, Product, Project, Selection).

### Module III

Normalization (First, Second, Third, Fourth, BCNF),SQL: Introduction To SQL- Tables DDL, DML, DCL (In Detail), Data Types.

### Module IV

SQL Functions(Different Types of Functions),Operators(Arithmetic, Relational, Logical), Sub Quires (in Detail), Clauses(Having, Group By)

### Module V

Joins(Different Types of Join Statements),View, Introduction to Sequence, Index and Triggers

### Textbook:

1. Data Base Concept 3 edition Abraham Silberschatz, Henery f Korth McGraw Hill
2. A Guide to the SQL Standard, C. J. Date and Hugh Darwen, 1997, Addison-Wesley

### Reference:

1. An Introduction to Database Systems, C. J. Date, 1994, Addison-Wesley
2. Understanding the New SQL, Jim Melton and Alan R. Simon, 1993, Morgan Kaufmann.
3. Principles of Database & Knowledge Jeffrey D. Ullman, Computer Science Press, 1988

## Model Question Paper

### 5D03BCA Database Management System

Time: 2 Hrs

Max. Marks: 20

#### SECTION A

Answer in one word

(8 x 0.5 = 4 marks)

1. The collection of information stored in the database is called.....
2. The data hold across the primary key column must be \_\_\_\_\_
3. ----- is the total no. of entity sets participating in a relationship set.
4. \_\_\_\_\_ Keys represent relationships between tables.
5. The structure of database is.....
6. ....is the association among several entities.
7. For each attribute there is a set of permitted values is called \_\_\_\_\_
8. An entity set without having a primary key is called -----

#### SECTION B

Write short notes on ANY THREE of the following questions

(3x 2 = 6 marks)

9. Explain about INSERT command?
10. What is the usage of CREATE command?
11. Which are the different types of attributes?
12. Explain UPDATE command.
13. Define foreign key.

#### SECTION C

Answer ANY TWO of the following questions

(2x 3 = 6 marks)

14. Explain the advantages of DBMS?
15. Which are the different types of keys?
16. Explain components of SQL?
17. Write a note on ALTER command?

#### SECTION D

Write an essay on ANY ONE of the following questions

(1 x 4 = 4 marks)

18. Explain ER data Model.
19. Write a detailed note on normalization

## ELECTIVES – SECTION A

For all the elective papers 4 hours per week and 3 credits will be awarded

### **6B19BCA - E01** **INFORMATION SECURITY**

**Hours per Week : Theory - 4**

**Credits : 3**

#### **Module I**

Introduction to Information Security- The need for Security, Principles of security - confidentiality, Authentications, Integrity, Non-repudiation. Types of attacks- Passive attacks, Active attacks, Virus, Worm, Trojan horse. Introduction to Cryptography, Steganography, Secret Sharing.

#### **Module II Symmetric Key Encipherment:-**

Traditional symmetric Key Ciphers: Introduction-Kirchhoff's principle, cryptanalysis, categories of traditional ciphers; Substitution Ciphers - monoalphabetic ciphers, polyalphabetic ciphers; Transposition Ciphers - keyless and keyed transposition ciphers, Stream and Block Ciphers - stream ciphers, block ciphers.

#### **Module III DES(Data Encryption Standard):-**

Introduction, DES Structure - initial and final permutations, rounds, cipher and reverse cipher, examples; DES Analysis - properties, design criteria, DES weaknesses; Multiple DES - double DES, triple DES; Security of DES - brute-force attack, differential cryptanalysis, linear cryptanalysis.

#### **Module IV Public key Cryptosystem:**

Principles of Public Key Cryptosystems- Public Key Cryptosystem, Applications of Key Cryptosystems, Requirement for Public Key Cryptosystem, Public Key Cryptanalysis. RSA Algorithm – Description of the Algorithm, Computational Aspects, Security of RSA.

#### **Module V Digital Signature:-**

Comparison- inclusion, verification method, relationship, duplicity; Process- needs for keys, signing the digest; Service- message authentication, message integrity, nonrepudiation, confidentiality; Attacks on Digital Signature- attack types; Digital Signature Schemes- RSA digital signature schemes

#### **Text Books:**

1. Cryptography and Network Security”, Behrouz A Forouzan, Tata McGraw-Hill Publishing Company Limited, Special Indian Edition 2007. (For Module - I, II, III, V).
2. Cryptography and Network Security Principles and Practices, William Stallings, Pearson Education (For Module - IV ).

#### **Reference:**

1. Fundamentals of computer security, Josef Pieprzyk, Thomas hardjino and Jennifer Seberry, Springer International Edition 2008

## Model Question Paper 6B19BCA – E01 INFORMATION SECURITY

Time: 3 Hrs

Max. Marks: 40

### SECTION A

1. **One word answer** (8 x 0.5 = 4 marks)

- a. ....means concealing the contents of a message by enciphering.
- b. The encrypted message is called .....
- c. In a ....., encryption and decryption are done one symbol at a time.
- d. In Asymmetric Key Cryptography, private key is used for .....
- e. .... refers to the science and art of transforming messages to make them secure and immune to attacks.
- f. What is the valid key length for AES cipher?
- g. DES uses a key generator to generate sixteen .....round keys.
- h. ....means preventing the denial of previous commitments or actions.

### SECTION B

Write short notes on **ANY SEVEN** of the following questions (7 x 2 = 14 marks)

2. Distinguish between encryption and decryption algorithm with eg.
3. Explain different transposition ciphers. Give eg.
4. Write a note on substitution cipher. Give egs.
5. Compare block cipher with stream cipher.
6. Explain the terms cryptography, cryptanalysis, cryptosystem, steganography with egs.
7. List and explain the objectives of Information Security.
8. Write a note on Digital Signatures.
9. Discuss the criteria for evaluating block ciphers.
10. Discuss the single round of DES.
11. How Steganography differs from Cryptography.

### SECTION C

Answer **ANY FOUR** of the following questions (4 x 3 = 12 marks)

12. Define Passive attack. Write a note on the different types of passive attacks.
13. Explain : a) Virus b) Worm c) Trojan Horse
14. Explain the attack threatening to confidentiality.
15. Explain security services provided by Digital Signatures.
16. Explain RSA Digital Signature Scheme.
17. Distinguish between Symmetric key encipherment and asymmetric key encipherment.

### SECTION D

Write an essay on **ANY TWO** of the following questions (2 x 5 = 10 marks)

18. Discuss in detail different polyalphabetical substitution ciphers.
19. Explain RSA algorithm with eg.
20. Explain DES in detail.
21. (i) Explain the different categories of computer virus.  
(ii) Explain in detail Digital Certificate and its structure.

## **6B19BCA - E02**

# **INFORMATION STORAGE SYSTEM**

**Hours per Week : 4**

**Credits : 3**

### **Module I**

Introduction to Storage Technology: Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information Lifecycle Management, Data categorization.

### **Module II**

Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to hoststorage provisioning, mapping and operation.

### **Module III**

Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparison. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

### **Module IV**

Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM)

### **Module V**

Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

### **References:**

1. G. Somasundaram & Alok Shrivastava (EMC Education Services) editors; Information Storage and Management: Storing, Managing, and Protecting Digital Information; Wiley India.
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSES, INFINIBAND and FCOE, Wiley India.
3. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation , Management and Security, CRC Press, Taylor Frances Pub.
4. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System & Application, Springer.
5. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach, TMH Pub.
6. Saurabh , Cloud Computing : Insight into New Era Infrastructure, Wiley India.
7. Sosinsky, Cloud Computing Bible, Wiley India.

## Model Question Paper

### 6B19BCA-E02 INFORMATION STORAGE SYSTEM

Time: 3 Hrs

Max. Marks: 40

#### SECTION A

##### 1. One word answer

- a. A client server system refers to accessing information, processing or storage on a typically more powerful separate system from a less powerful computer (True/False)
- b. Which two RAID types use parity for data protection?
- c. In SAN storage model, the operating system view storage resources as —— devices
- d. Expand SNMP
- e. Transport protocol used for XMLCIM is -----
- f. What is the name of the raid module in a linux kernel?
- g. What is the most popular use case for public cloud computing today?
- h. The term 'Cloud' in cloud computing refers to -----

#### SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Different types of data.
3. What is SNMP?
4. Explain JBOD.
5. What is cloud computing?
6. Write short note on Data Centre.
7. List the Backup Topologies.
8. What are the limitations of DAS?
9. What is hot sparing?
10. What do you mean by Data proliferation
11. List the cloud benefits.

#### SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Characteristics of cloud computing.
13. Describe Backup Granularity?
14. Explain the Different Types of SCSI?
15. What are the factors that affecting NAS performance?
16. Explain the architectural framework of clouds.
17. Briefly Explain about Disk drive Components?

#### SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Explain the Different forms of Virtualization?
19. Explain the application and services on cloud.
20. Explain the RAID levels.
21. Compare SAN and CAS.

## **6B19BCA - E03**

# **MOBILE COMMUNICATIONS**

**Hours per Week : Theory 4**

**Credits : 3**

### **Module I**

Introduction – history of wireless communication, A simplified reference model, frequencies for radio transmission, signals, Antennas, signal Propagation, Spread spectrum – DSSS and FHSS, Cellular systems.

### **Module II**

SDMA, FDMA, TDMA and CDMA, GSM – Mobile services, system Architecture, Radio interface, Protocols, Localization and Calling, Handover, Security, GPRS.

### **Module III**

Wireless LAN – infrared versus Radio transmission, IEEE 802.11 – system Architecture, Protocol architecture, Physical Layer, MAC Layer, MAC Management, 802.11b, 802.11a. Introduction to Bluetooth – IEEE 802.15.

### **Module IV**

Mobile IP – entities and Terminology, IP Packet delivery, Agent discovery, Registration, tunneling, IPV6, Introduction to MANET, TCP over 2.5/3G Wireless Networks.

### **Module V**

WAP (1.x) – Architecture, Wireless Datagram Protocol, Wireless Transport Layer security. Wireless Transaction Protocol, wireless Session Protocol, wireless Application Environment, wireless Markup Language, WML script, Introduction to WAP 2.0.

### **Text book :**

1. Mobile communications, Jochen Schiller, 2<sup>nd</sup> edn, Pearson education. 2.

### **Reference :**

- Wireless Communication Technology, R. Blake, Thomson Delmar, 2003.
- Mobile communication engineering: theory and Applications, W. C. Y. Lee, 2<sup>nd</sup> edn, Mc Graw Hill international Edn, 1998.
- Wireless digital Communication, Feher, PHI, 199.
- Principles and Applications of GSM, Vijay K. garg & J. e. Wilkes, Prentice Hall, 1999

## Model Question Paper

### 6B19BCA -E03 MOBILE COMMUNICATIONS

Time: 3 Hrs

Max. Marks: 40

#### SECTION A

1. One word answer

(8 x 0.5 = 4 marks)

- a. The frequency range 3MHZ-30MHZ is called.....
- b. TDM stands for.....
- c. The data rate of 802.11n is .....
- d. What is the frequency level of Skywares
- e. Groundwaves have frequencies.....
- f. WAP stands for.....
- g. A bluetooth network is also called as .....
- h. MAC stands for.....

#### SECTION B

Write short notes on ANY SEVEN of the following questions

(7 x 2 = 14 marks)

2. Explain isotropic radiator.
3. What is BSS?
4. Define ECN.
5. Define IMSI.
6. Explain delayspread.
7. What is sniffstate?
8. What is HomeAgent?
9. What are advantages of infrared technology?
10. Expalin TMSI.
11. What are the propagational behaviour of radiowaves?

#### SECTION C

Answer ANY FOUR of the following questions

(4 x 3 = 12 marks)

12. What is an infrastructure network?
13. What are the three alternatives for implementing an HA?
14. What are the ranges for transmission in wireless communication?
15. What is Agent Advertisements?
16. What is IP in IP encapsulation?
17. What are factors to be considered while deploying appilcation over 2.5G/3G wireless link?

#### SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. What are the terms and entities used in MobileIP? Explain each of them?
19. What are desired characteristics of WLAN products?
20. Explain the Handover procedures in Cellular system?
21. What are the 3 major operations to be done for mobile nodes to communicate each other in Mobile IP communication?



**ELECTIVES – SECTION B****6B20BCA - E04****ALGORITHM ANALYSIS AND DESIGN****Hours per Week : Theory - 4****Credits : 3****Module 1:**

Introduction- Definition of algorithm, Areas of algorithm study, performance analysis, Time and space complexity, asymptotic notations ( $O$ ,  $\Theta$ ,  $T$ ).

**Module 2:**

Divide and Conquer – general method, Binary search, Finding the maximum and minimum, Merge sort, Quick sort, Performance measurement of quick sort, selection, Strassen's matrix multiplication.

**Module 3:**

Greedy method – General method, knapsack problem, job sequencing with dead lines, minimum cost spanning trees, prims algorithm, kruskals algorithms, optimal merge patterns, single source shortest path, optimal binary search trees.

**Module 4:**

Dynamic programming – General method, multistage graph, allpairs shortest path, single shortest path, 0/1 knapsack travelling sales person problem.

**Module 5:**

Basic traversal and Search techniques – Breadth First Search and traversal, Depth First Search and Traversal, Bi-connected components and DFS; Backtracking – General methods, 8-queens problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

**Text Book:**

1. Ellis Horowitz, Sartaj Sahni, S Rajasekharan – Computer Algorithms/C++ - Second Edition, Universities press, 2008 (Paperback Edn)

**Reference:**

1. Introduction to the design and Analysis of Algorithms, Anany Levitin, 2<sup>nd</sup> Edn, pearson education.

## Model Question Paper

### 6B20BCA - E04 ALGORITHM ANALYSIS AND DESIGN

Time: 3 Hrs

Max. Marks: 40

#### SECTION A

1. One word answer

(8 x 0.5 = 4 marks)

- a. An identifier begins with a .....
- b. The magic square is represented using ..... having n rows and n columns.
- c. A graph is said to be ..... if it can be drawn in a plane in such a way that no two edges cross each other.
- d. Performance measurement is concerned with obtaining ..... requirements of a particular algorithm.
- e. Two search strategies are ..... and .....
- f. The number of edges in a graph G of degree of any vertex can be determined in ..... times.
- g. Sum of degrees of vertices of undirected graph is ..... the number of edges.
- h. A connected component of an undirected graph is called.....

#### SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. What do you mean by an algorithm?
3. Write an algorithm for Greedy method control abstraction for subset paradigm.
4. Explain Optimal merge pattern.
5. Explain dynamic programming.
6. What is multistage graphs? Explain with eg.
7. Explain 8-queens problem.
8. What do you mean by Hamiltonian cycles?
9. Explain Graph coloring with an eg.
10. Write down the algorithm for Select2.
11. Define space complexity and time complexity of an algorithm.

#### SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Describe Strassen's matrix multiplication
13. Define algorithm for binary search
14. Write algorithm for merge sort and quick sort
15. Explain algorithm for greedy strategies for the knapsack problem
16. Explain Knapsack travelling salesperson problem
17. Techniques for binary trees

#### SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Determine optimal r values for worst case and average performance of function select
19. Explain minimum cost spanning tree in the case of Prim's algorithm and Kruskal's algorithm.
20. Explain job sequencing with deadlines.
21. Compare breadth first search and depth first search techniques

## **6B20BCA - E05**

# **NETWORK PROGRAMMING**

**Hours per Week :Theory - 4**

**Credits : 3**

### **Module I**

Introduction – A Simple Day Time Client – Protocol Independence – Error Handling – A Simple - Day Time Server. The Transport Layer : TCP, UDP – TCP Connection Establishment and Termination – TIME\_WAIT State – Port Numbers – Concurrent Servers – Buffer Size and Limitations – Standard Internet Services – Protocol Usage by Common Internet Applications.

### **Module II**

Socket Introduction – Socket address Structures – Byte Ordering Functions – Byte Manipulation Functions – Elementary TCP Sockets – socket , connect, bind, listen, accept, fork and exec, close, getsockname and getpeername functions

### **Module III**

TCP Client/Server Example – TCP Echo Server - main(), str\_echo() – TCP Echo Client -main(), str\_cli() – startup – termination – Shutdown of Server Host.

### **Module IV**

Socket Options – getsockopt and setsockopt functions – Socket States – Generic Socket Options – TCP Socket Options.

### **Module V**

Name and Address Conversions - DNS – gethostbyname – gethostbyaddr – getservbyname – getservbyport – getaddrinfo – freeaddrinfo – host\_serv – tcp\_connect – tcp\_listen functions.

### **Text Book**

1. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, “Unix Network Programming The Sockets Networking API Volume I”, Pearson Education

### **Reference**

1. Barry Nance, “Network Programming in C” , Prentice Hall

## Model Question Paper 6B20BCA - E05 NETWORK PROGRAMMING

Time: 3 Hrs

Max. Marks: 40

### SECTION A

**1. One word answer**

- a. The getsockopt() function return -----
- b. DNS stands for -----
- c. fork system call is used for -----
- d. UDP means -----
- e. ----- is the default port no. for HTTP communication.
- f. The function getservbyport() return -----
- g. bind system call is used for -----
- h. ----- option is used to send packets without delay while sending small packets.

### SECTION B

**Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)**

2. Differentiate exit and \_exit functions
3. Show how the current signal mask of a signal can be changed?
4. State the purpose of SO\_REUSEADDR and SO\_REUSEPORT Socket options.
5. List out the information maintained by Zombie State.
6. Show how TCP maintains queue for listening socket.
7. How TCP\_NODELAY option is used while sending small packets?
8. State few functions and uses of a raw socket.
9. How, when and why a client that wants to access a site in remote server would accesses the DNS?
10. How a client running on IPV4 configured host communicate with a server in IPV6 host?
11. Write a program to find the host byte order.

### SECTION C

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

12. State the conditions that generate a signal.
13. Explain Raw Socket Creation.
14. Explain the characteristics of Process Groups and Sessions.
15. Write notes on Signal Sets.
16. Write notes on Message Queues.
17. Explain Shared memory.

### SECTION D

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

18. Explain get host by name, get host by name2 with resolver option and the structure these two points by their return value.
19. Explain the various TCP Socket options in detail.
20. Write a Concurrent server program which uses TCP and show the status of Client and Server before call to fork, after fork and after socket closing by parent and child.
21. Explain the various UDP server side System Calls and getsocket , setsocket functions in detail.

## **6B20BCA - E06**

# **DIGITAL IMAGE PROCESSING**

**Hours per Week : Theory - 4**

**Credits : 3**

### **Module I**

Images – DIP components – Problems and Applications – motivation and perceptivity – Operations – Imaging – electronic camera – Human Eye – 3D imaging – Depth from triangulation, time-of-flight, interferometry, shading, tomography, Sampling – quantization, Colour Image representation, Volumetric data.

### **Module II**

Images in Java – java2D API – java advanced imaging – image manipulation – storage – reading and writing images – display – printing – pixel processing – gray level and colour enhancement – mapping – image histogram – Histogram equalization – Colour processing.

### **Module III**

Neighbourhood operations – convolutions and correlation – Linear and rank filtering – Edge detection – Hybrid adaptive filters – frequency domain – spatial frequency – fourier theory – DFT – investigating spectra – image filtering – deconvolution.

### **Module IV**

Geometric operation – simple techniques – Affine transformations – Algorithm – interpolation schemes – Wrapping and morphing – segmentation – thresholding – Contextual techniques.

### **Module V**

Morphological image processing – Basic concepts – operations – Morphological filtering – Morphological algorithms – Gray scale morphology – image compression. Redundancy – Performance characterization – Lossy and lossless compression techniques – compression of moving images.

### **Text book:**

Digital image Processing : A practical introduction using Java ; Nick Efford; Pearson Edn.

### **Reference:**

1. Digital Image Processing; Gonzalez and Woods; Pearson Edn.
2. Digital image Processing; B. Jahne; Springer international Edn.

## Model Question Paper 6B20BCA - E06 DIGITAL IMAGE PROCESSING

Time: 3 Hrs

Max. Marks: 40

### SECTION A

#### 1. One word answer

(8 x 0.5 = 4 marks)

- a. The non separable exponential function is -----
- b. The fourier transformation for one dimensional sequence is -----
- c. ----- is an area that also deals with improving the appearance of an image.
- d. Digitizing the amplitude values is called -----
- e. The method used to generate a processed image that has a specified histogram is called -----
- f. The way of representing a contour by a set of boundary points or by a single boundary point and a set of directional is referred to as-----
- g. ----- is the most frequently used transformation for image compression.
- h. The process by which a training set is used to obtain decision function is called -----

### SECTION B

Write short notes on ANY SEVEN of the following questions

(7 x 2 = 14 marks)

- 2 What is RGB colour model
- 3 What is colour image compression
- 4 Explain coding redundancy
- 5 Explain dilation
- 6 Describe Intensity slicing
- 7 Explain erosion
- 8 Describe band pass filters
- 9 Explain colour slicing
- 10 Write notes on wrapping
- 11 Write notes on colour image smoothing

### SECTION C

Answer ANY FOUR of the following questions

(4 x 3 = 12 marks)

- 12 Explain pixel processing
- 13 Describe edge detection
- 14 Describe wrapping and morphing
- 15 Explain image filtering
- 16 What is tomography
- 17 What is histogram processing

### SECTION D

Write an essay on ANY TWO of the following questions

(2 x 5 = 10 marks)

- 18 Explain spatial transformations
- 19 Describe spatial frequency
- 20 Write notes on lossy and lossless compression techniques
- 21 Explain multi resolution expansion

*Sd/-*

*Shijo M Joseph*

*Chairman BOS Computer Science (UG)*

  
**KANNUR UNIVERSITY**

(Abstract)

BA Economics /Development Economics Programmes - Revised Scheme, Syllabi and Model Question Papers - Core/Complementary/Open Courses under Choice Based Credit Semester System-Implemented with effect from 2014 Admission - Orders issued.

ACADEMIC BRANCH

U.O No. Acad/C1/4271/2014

Dated, Civil Station (PO). 3-05-2014

- Read: 1. U.O.No.Acad/C2/2232/2014 dated 14/03/2014  
2. Minutes of the meeting of the Board of Studies in Economics UG held on 15-01-2014  
3. Minutes of the meeting of the Faculty of Humanities held on 27-03-2014  
4. Letter dated 11-04-2014 from the Chairman, Board of Studies Economics UG

ORDER

1. The Revised Regulations for Choice based Credit Semester System have been implemented in this University with effect from 2014 admission vide paper read (1) above.
2. As per the paper read (2) above, Board of Studies in Economics (UG) finalized the Scheme, Syllabi and Model Question Papers for BA Economics/Development Economics under Choice Based Credit Semester System with effect from 2014 admission.
3. As per the paper read (3) above the meeting of Faculty of Humanities approved the Scheme, Syllabi and Model question papers for BA Economics/Development Economics w.e.f.2014 admission.
4. The Chairman, Board of Studies in Economics (UG), vide paper (4) read above has forwarded the Scheme, Syllabi and Model Question Papers for BA Economics/Development Economics for implementation with effect from 2014 admission.
5. The Vice Chancellor after considering the matter in detail and in exercise of the powers of Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement the revised Scheme, Syllabi and Model Question Papers (Core/Complementary/Open Courses) for BA Economics/Development Economics under Choice Based Credit Semester System with effect from 2014 admission subject to report Academic Council.
6. Orders are, therefore, issued accordingly.
7. The Implemented Scheme, Syllabi and Model Question Papers are appended.

Sd/-  
DEPUTY REGISTRAR (Academic)  
For REGISTRAR

To  
The Principals of Colleges offering BA Economics/Developing Economics Programme.

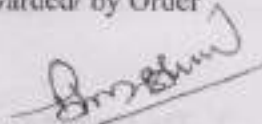
(PTO)

5/5/14

1. The Examination Branch (through PA to CE)
2. PS to VC/PA to /PA to Registrar /
3. Chairman BOS Economics (UG)
4. PA to CE
5. DR/AR I Academic
6. SF/DF/FC.



Forwarded/ by Order

  
Section Officer

**For more details; log on [www.kannur university.ac.in](http://www.kannur university.ac.in)**





# **KANNUR UNIVERSITY**



## **COURSE STRUCTURE**

### **SYLLABUS**

**And**

## **MODEL QUESTION PAPERS**

**For**

## **BA ECONOMICS/DEVELOPMENT ECONOMICS**

**Under**

**Kannur University Regulations for  
Choice Based Credit and Semester System  
For Under-Graduate Curriculum 2014  
(KUCBCSSUG 2014)**

**KANNUR UNIVERSITY**  
**BOARD OF STUDIES IN ECONOMICS (UG)**  
**RESTRUCTURED CURRICULUM OF UNDERGRADUATE ECONOMICS PROGRAMME**  
**2014 Admission onwards**

Economics is one of the most dynamic and fast growing disciplines coming under the purview of social sciences. Its horizon begins from the boundary of social sciences but expands comprehensively to other sciences on account of its relatively fairer degree of objectivity and profoundly greater strength of applicability of quantitative techniques. Its widening perspectives and high degree of adaptability and flexibility to link itself with other sciences make it a unique field of interdisciplinary and multidisciplinary advancement of scientific knowledge. Finding knowledge gaps and filling these gaps are happening in this field at a remarkable pace and intensity. Thus, complicated socio-economic problems get transitory or enduring solutions.

Association of economics with management studies, environmental sciences, demography, health sciences, etc. has opened multiple branches of economics. Environmental economics, resource economics, managerial economics, gender economics, health economics, etc. are few such branches. Besides these interdisciplinary and multidisciplinary areas of scientific knowledge, economics has its newer branches like constitutional economics, econophysics, neuro-economics etc.

Economics uses the tools of various disciplines like management studies, mathematics, statistics, and their sophisticated software and has become an integral part of knowledge explosion. It has interdisciplinary approaches in teaching and learning, research and exploration, and formulation and application of socio political and economic policies. Combining these advancements with our great achievements in science and technology we can make our farms and firms less risky . For this we need to connect our knowledge and research centers directly or indirectly with the farms and firms. Along with the establishment of research and knowledge centers we need to enrich and update the syllabi at the undergraduate level, which is the very foundation of Higher Education. The ongoing syllabi at the undergraduate level are not a perfect and smooth continuation and expansion of the syllabi at Higher Secondary level of education. They need modifications and improvements in tune with the latest developments in economic thought, technique and analysis, and the rapidly changing socio-economic environment of our country.

The revised syllabi, a product of a series of workshops conducted under the aegis of the U G Board of Studies and enriched by the active participation of faculty members, research scholars and experts of academia, are expected to impart professionalism and provide insight into the newly emerging areas of knowledge. A good number of teachers and academicians within and outside the State have contributed their knowledge, experience and service to this academic exercise. The deliberation of the experts from various fields and existing syllabi of different universities have been immensely used for framing the new syllabi of the BA Economics Programme. It is also to be pointed out that before finalizing the syllabi, experts from other universities were consulted and their suggestions incorporated. The new and revised syllabi are expected to meet the requirements of the time and materialize the mission and vision of the Higher Education.

**DR NJ SALEENA**  
*Chairperson, Board of Studies in Economics (UG)*  
*Kannur University*

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**TABLE FOR COURSE STRUCTURE FOR BA**  
**ECONOMICS/DEVELOPMENT ECONOMICS PROGRAMME**

| Subject                                     | Sem                           | Common Course                         |                                     |                                   | General                        | Core                              |   |   |   |                                       | Compleme<br>ntary |                                    | Open     | Total      |
|---------------------------------------------|-------------------------------|---------------------------------------|-------------------------------------|-----------------------------------|--------------------------------|-----------------------------------|---|---|---|---------------------------------------|-------------------|------------------------------------|----------|------------|
|                                             |                               | English<br>(First<br>Language)        | HIN/MAL/URD<br>(Second<br>Language) |                                   |                                | Economics                         |   |   |   |                                       |                   |                                    |          |            |
| English<br>Literat<br>ure &<br>Langua<br>ge | I                             | 4                                     | 3                                   | 4                                 | 5                              |                                   |   |   |   | 4                                     | -                 |                                    | 20       |            |
|                                             | II                            | 4                                     | 3                                   | 4                                 | 4                              |                                   |   |   |   | 4                                     | -                 |                                    | 19       |            |
|                                             | III                           | 4                                     |                                     | 4                                 | 5                              | 4                                 |   |   |   |                                       | 4                 |                                    | 21       |            |
|                                             | IV                            | 4                                     |                                     | 4                                 | 4                              | 4                                 |   |   |   |                                       | 4                 |                                    | 20       |            |
|                                             | V                             | ----                                  |                                     | ---                               | 4                              | 4                                 | 4 | 4 | 4 |                                       |                   | 2                                  | 22       |            |
|                                             | VI                            |                                       |                                     |                                   | 4                              | 4                                 | 4 | 4 | 2 |                                       |                   |                                    | 18       |            |
|                                             | <b>Total</b>                  | <b>22 Credits<br/>(300<br/>Marks)</b> |                                     | <b>16 Credits<br/>(200 Marks)</b> |                                | <b>64 Credits<br/>(775 Marks)</b> |   |   |   |                                       | <b>8</b>          | <b>8</b>                           | <b>2</b> | <b>120</b> |
|                                             | <b>38 Credits (500 Marks)</b> |                                       |                                     |                                   | <b>82 Credits (1000 Marks)</b> |                                   |   |   |   | <b>16 Credits<br/>(200<br/>Marks)</b> |                   | <b>2Credits<br/>(25<br/>Marks)</b> |          |            |
| <b>Grand Total      1500 Marks</b>          |                               |                                       |                                     |                                   |                                |                                   |   |   |   |                                       |                   |                                    |          |            |
| <b>Total Credit                  120</b>    |                               |                                       |                                     |                                   |                                |                                   |   |   |   |                                       |                   |                                    |          |            |

## B A ECONOMICS/ DEVELOPMENT ECONOMICS

**Total number of Common courses : 10**

**Total Credit : 38**

**Total number of**

**a) Core courses : 15+Project work**

**b) Complementary Courses : 4**

**Total Credits**

**a) Core courses : 64**

**b) Complementary Courses : 16**

**Total number of Open Courses : 1**

**Total Credits : 2**

**Total Credit for B A Programme : 120**

## Scheme and Marks Distribution for BA Programme in Economics

| Sem | Course               | Course Code              | Name of the Paper                                            | Hours/week | Credit | Marks                |
|-----|----------------------|--------------------------|--------------------------------------------------------------|------------|--------|----------------------|
| 1   | Common               | 1A01ENG                  | Common Course I English                                      | 5          | 4      | 40+10=50             |
|     | Common               | 1A02ENG                  | Common Course II English                                     | 4          | 3      | 40+10=50             |
|     | Common<br>(Language) | 1A07MAL/HIN/<br>ARB/URD  | Common Course I Additional<br>Language                       | 4          | 4      | 40+10=50             |
|     | Core                 | 1B01ECO                  | Micro Economic Analysis-I                                    | 6          | 5      | 40+10=50             |
|     | Complimentary        | 1C0                      | Complimentary I                                              | 6          | 4      | 40+10=50             |
| 2   | Common               | 2A03ENG                  | Common Course III English                                    | 5          | 4      | 40+10=50             |
|     | Common               | 2A04ENG                  | Common Course IV English                                     | 4          | 3      | 40+10=50             |
|     | Common<br>(Language) | 2A08MAL/HIN/<br>ARB/URD  | Common Course II Additional<br>Language                      | 4          | 4      | 40+10=50             |
|     | Core                 | 2B02ECO                  | Micro Economic Analysis-II                                   | 6          | 4      | 40+10=50             |
|     | Complementary        | 2C0                      | Complimentary II                                             | 6          | 4      | 40+10=50             |
| 3   | Common               | 3A05ENG                  | Common Course V English                                      | 5          | 4      | 40+10=50             |
|     | Common<br>(Language) | 3A09 MAL/HIN/<br>ARB/URD | Common Course III Additional<br>Language                     | 5          | 4      | 40+10=50             |
|     | Core                 | 3B03ECO                  | Macro Economic Analysis-I                                    | 5          | 5      | 40+10=50             |
|     | Core                 | 3B04ECO                  | International Economics                                      | 4          | 4      | 40+10=50             |
|     | Complementary        | 3C0                      | Complimentary 1                                              | 6          | 4      | 40+10=50             |
| 4   | Common               | 4A06ENG                  | Common Course VI English                                     | 5          | 4      | 40+10=50             |
|     | Common<br>(Language) | 4A10MAL/HIN/<br>ARB/URD  | Common Course IV Additional<br>Language                      | 5          | 4      | 40+10=50             |
|     | Core                 | 4B05ECO                  | Macro Economic Analysis-II                                   | 5          | 4      | 40+10=50             |
|     | Core                 | 4B06ECO                  | Environmental Economics                                      | 4          | 4      | 40+10=50             |
|     | Complementary        | 4C0                      | Complimentary II                                             | 6          | 4      | 40+10=50             |
| 5   | Open                 | 5D0ECO                   | -----                                                        | 2          | 2      | 20+05=25             |
|     | Core                 | 5B07ECO                  | Basic Tools for Economic<br>Analysis-1                       | 6          | 4      | 40+10=50             |
|     | Core                 | 5B08ECO                  | Alternative Economics                                        | 4          | 4      | 40+10=50             |
|     | Core                 | 5B09ECO                  | Research Methods and<br>Techniques for Economic<br>Analysis  | 4          | 4      | 40+10=50             |
|     | Core<br>Core         | 5B10ECO<br>5B11ECO       | Development Economics<br>Economics of Banking and<br>Finance | 4<br>5     | 4<br>4 | 40+10=50<br>40+10=50 |
| 6   | Core                 | 6B12ECO                  | Basic Tools for Economic<br>Analysis-II                      | 6          | 4      | 40+10=50             |
|     | Core                 | 6B13ECO                  | Central Themes in Indian<br>Economy                          | 5          | 4      | 40+10=50             |
|     | Core                 | 6B14ECO                  | Public Economics                                             | 6          | 4      | 40+10=50             |
|     | Core                 | 6B15ECO                  | Basic Econometric analysis                                   | 5          | 4      | 40+10=50             |
|     | Project              | 6B16 ECO(Pr)             | Project                                                      | 3          | 2      | 20+05=25             |

## **CORE COURSES**

- **MICRO ECONOMIC ANALYSIS I**
- **MICRO ECONOMIC ANALYSIS II**
- **MACRO ECONOMIC ANALYSIS I**
- **INTERNATIONAL ECONOMICS**
- **MACRO ECONOMIC ANALYSIS II**
- **ENVIRONMENTAL ECONOMICS**
- **BASIC TOOLS FOR ECONOMIC ANALYSIS I**
- **ALTERNATIVE ECONOMICS**
- **RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS**
- **DEVELOPMENT ECONOMICS**
- **ECONOMICS OF DEVELOPMENT AND PLANNING 1**
- **ECONOMICS OF BANKING AND FINANCE**
- **BASIC TOOLS FOR ECONOMIC ANALYSIS II**
- **CENTRAL THEMES IN INDIAN ECONOMY**
- **ECONOMICS OF DEVELOPMENT AND PLANNING 11**
- **PUBLIC ECONOMICS**
- **BASIC ECONOMETRIC ANALYSIS**
- **PROJECT**

## **COMPLEMENTARY COURSES**

### **ECONOMICS / NON ECONOMICS FACULTY**

- **MATHEMATICS FOR ECONOMIC ANALYSIS- I**
- **MATHEMATICS FOR ECONOMIC ANALYSIS- II**
- **MATHEMATICAL ECONOMICS-I**
- **MATHEMATICAL ECONOMICS-II**
- **INTRODUCTORY ECONOMICS- I (FOR NON ECONOMICS FACULTY ONLY)**
- **INTRODUCTORY ECONOMICS- II (FOR NON ECONOMICS FACULTY ONLY)**
- **HISTORY OF ECONOMIC THOUGHT-I**
- **HISTORY OF ECONOMIC THOUGHT-II**
- **POPULATION STUDIES**
- **REGIONAL ECONOMICS**
- **AGRICULTURAL ECONOMICS**
- **GENDER ECONOMICS**



## **OPEN COURSES**

Six open Courses are listed during the V Semester. Colleges have the freedom to select any one of the Open Courses.

### **Semester-V**

- **ECONOMICS OF TRAVEL AND TOURISM**
- **KERALA ECONOMY**
- **ECONOMICS OF SHARE MARKET**

# COURSE STRUCTURE FOR BA ECONOMICS/DEVELOPMENT ECONOMICS

## TABLE FOR COMMON COURSES

| Sl No. | Semester | Course Code         | Title of the paper           | Contact Hour/week | Credits | Marks    |
|--------|----------|---------------------|------------------------------|-------------------|---------|----------|
| 1      | 1        | 1A01ENG             | Common Course I English      | 5                 | 4       | 40+10=50 |
| 2      | 1        | 1A02ENG             | Common Course II English     | 4                 | 3       | 40+10=50 |
| 3      | 1        | 1A07MAL/HIN/ARB/URD | Common Course I Additional   | 4                 | 4       | 40+10=50 |
| 4      | 11       | 2A03 ENG            | Common Course III English    | 5                 | 4       | 40+10=50 |
| 5      | 11       | 2A04 ENG            | Common Course IV English     | 4                 | 3       | 40+10=50 |
| 6      | 11       | 2A08MAL/HIN/ARB/URD | Common Course II Additional  | 4                 | 4       | 40+10=50 |
| 7      | 111      | 3A05ENG             | Common Course V English      | 5                 | 4       | 40+10=50 |
| 8      | 111      | 3A09MAL/HIN/ARB/URD | Common Course III Additional | 5                 | 4       | 40+10=50 |
| 9      | IV       | 4A06ENG             | Common Course VI English     | 5                 | 4       | 40+10=50 |
| 10     | IV       | 4A10MAL/HIN/ARB/URD | Common Course IV Additional  | 5                 | 4       | 40+10=50 |

**TABLE FOR CORE COURSES: BA ECONOMICS PROGRAMME**

| <b>SL. No</b> | <b>Semester</b> | <b>Course Code</b> | <b>Name of the paper</b>                              | <b>Contact Hour/ week</b> | <b>Credits</b> |
|---------------|-----------------|--------------------|-------------------------------------------------------|---------------------------|----------------|
| 1             | I               | 1B01ECO            | Micro Economic Analysis-I                             | 6                         | 5              |
| 2             | II              | 2B02ECO            | Micro Economic Analysis-II                            | 6                         | 4              |
| 3             | III             | 3B03ECO            | Macro Economic Analysis-I                             | 5                         | 5              |
| 4             | III             | 3B04ECO            | International Economics                               | 4                         | 4              |
| 5             | IV              | 4B05ECO            | Macro Economic Analysis-II                            | 5                         | 4              |
| 6             | IV              | 4B06ECO            | Environmental Economics                               | 4                         | 4              |
| 7             | V               | 5B07ECO            | Basic Tools for Economic Analysis-I                   | 6                         | 4              |
| 8             | V               | 5B08ECO            | Alternative Economics                                 | 4                         | 4              |
| 9             | V               | 5B09ECO            | Research Methods and Techniques for Economic Analysis | 4                         | 4              |
| 10            | V               | 5B10ECO            | Development Economics                                 | 4                         | 4              |
| 11            | V               | 5B11ECO            | Economics of Banking and Finance                      | 5                         | 4              |
| 12            | VI              | 6B12ECO            | Basic Tools for Economic Analysis-II                  | 6                         | 4              |
| 13            | VI              | 6B13ECO            | Central Themes in Indian Economy                      | 5                         | 4              |
| 14            | VI              | 6B14ECO            | Public Economics                                      | 6                         | 4              |
| 15            | VI              | 6B15ECO            | Basic Econometric Analysis                            | 5                         | 4              |
| 16            | VI              | 6B16 ECO (Pr)      | Project                                               | 3                         | 2              |

**TABLE FOR CORE COURSES: BA DEVELOPMENT ECONOMICS  
PROGRAMME**

| <b>SL. No</b> | <b>Semester</b> | <b>Course Code</b> | <b>Title of the course</b>                            | <b>Contact Hour/week</b> | <b>Credits</b> |
|---------------|-----------------|--------------------|-------------------------------------------------------|--------------------------|----------------|
| 1             | I               | 1B01ECO            | Micro Economic Analysis-I                             | 6                        | 5              |
| 2             | II              | 2B02ECO            | Micro Economic Analysis-II                            | 6                        | 4              |
| 3             | III             | 3B03ECO            | Macro Economic Analysis-I                             | 5                        | 5              |
| 4             | III             | 3B04ECO            | International Economics                               | 4                        | 4              |
| 5             | IV              | 4B05ECO            | Macro Economic Analysis-II                            | 5                        | 4              |
| 6             | IV              | 4B06ECO            | Environmental Economics                               | 4                        | 4              |
| 7             | V               | 5B07ECO            | Basic Tools for Economic Analysis-I                   | 6                        | 4              |
| 8             | V               | 5B08ECO            | Alternative Economics                                 | 4                        | 4              |
| 9             | V               | 5B09ECO            | Research Methods and Techniques for Economic Analysis | 4                        | 4              |
| 10            | V               | 5B10 DEV ECO       | Economics of Development and Planning -I              | 4                        | 4              |
| 11            | V               | 5B11ECO            | Economics of Banking and Finance                      | 5                        | 4              |
| 12            | VI              | 6B12ECO            | Basic Tools for Economic Analysis-II                  | 6                        | 4              |
| 13            | VI              | 6B13 DEV ECO       | Economics of Development and Planning -II             | 5                        | 4              |
| 14            | VI              | 6B14ECO            | Public Economics                                      | 6                        | 4              |
| 15            | VI              | 6B15ECO            | Basic Econometric Analysis                            | 5                        | 4              |
| 16            | VI              | 6B16DEV ECO(Pr)    | Project                                               | 3                        | 2              |

**TABLE FOR COMPLEMENTARY COURSES: BA ECONOMICS/  
DEVELOPMENT ECONOMICS PROGRAMME**

| <b>SL. No</b> | <b>Semester</b> | <b>Course Code</b> | <b>Title of the course</b>                                   | <b>Contact Hours/week</b> | <b>Credits</b> |
|---------------|-----------------|--------------------|--------------------------------------------------------------|---------------------------|----------------|
| 1             | I               | 1C01ECO            | Mathematics for Economic Analysis-I                          | 6                         | 4              |
| 2             | II              | 2C02ECO            | Mathematics for Economic Analysis-II                         | 6                         | 4              |
| 3             | III             | 3C03ECO            | Mathematical Economics-I                                     | 6                         | 4              |
| 4             | IV              | 4C04ECO            | Mathematical Economics-II                                    | 6                         | 4              |
| 5             | I               | 1C05ECO            | Introductory Economics-I(Non Economics Programmes Only)      | 6                         | 4              |
| 6             | II              | 2C06ECO            | Introductory Economics-II (For Non Economic Programmes Only) | 6                         | 4              |
| 7             | III             | 3C07ECO            | History of Economic Thought-I                                | 6                         | 4              |
| 8             | IV              | 4C08ECO            | History of Economic Thought-II                               | 6                         | 4              |
| 9             | 1               | 1C09ECO            | Population Studies                                           | 6                         | 4              |
| 10            | II              | 2C10ECO            | Regional Economics                                           | 6                         | 4              |
| 11            | III             | 3C11ECO            | Agricultural Economics                                       | 6                         | 4              |
| 12            | IV              | 4C12ECO            | Gender Economics                                             | 6                         | 4              |

**TABLE FOR OPEN COURSES: BA ECONOMICS/ DEVELOPMENT  
ECONOMICS**

**SEMESTER-V**

| <b>Sl.No</b> | <b>Course Code</b> | <b>Title of the course</b>      | <b>Contact Hours/week</b> | <b>Credits</b> |
|--------------|--------------------|---------------------------------|---------------------------|----------------|
| 1            | 5D01ECO            | Economics of Travel and Tourism | 2                         | 2              |
| 2            | 5D02ECO            | Kerala Economy                  | 2                         | 2              |
| 3            | 5D03ECO            | Economics of Share Market       | 2                         | 2              |

**B A ECONOMICS PROGRAMME**  
**CORE COURSE STRUCTURE**

| Sl. No | Course Code  | Name of the paper                                     | Semester in which the paper is offered | Credits for each paper | Contact hours per week | Examination Time | Marks          |
|--------|--------------|-------------------------------------------------------|----------------------------------------|------------------------|------------------------|------------------|----------------|
| 1      | 1B01ECO      | Micro Economic Analysis-I                             | I                                      | 5                      | 6                      | 3 hrs            | 40+10=50       |
| 2      | 2B02ECO      | Micro Economic Analysis-II                            | II                                     | 4                      | 6                      | 3 hrs            | 40+10=50       |
| 3      | 3B03ECO      | Macro Economic Analysis-I                             | III                                    | 5                      | 5                      | 3 hrs            | 40+10=50       |
| 4      | 3B04ECO      | International Economics                               | III                                    | 4                      | 4                      | 3 hrs            | 40+10=50       |
| 5      | 4B05ECO      | Macro Economic Analysis-II                            | IV                                     | 4                      | 5                      | 3 hrs            | 40+10=50       |
| 6      | 4B06ECO      | Environmental Economics                               | IV                                     | 4                      | 4                      | 3 hrs            | 40+10=50       |
| 7      | 5B07ECO      | Basic Tools for Economic Analysis-I                   | V                                      | 4                      | 6                      | 3 hrs            | 40+10=50       |
| 8      | 5B08ECO      | Alternative Economics                                 | V                                      | 4                      | 4                      | 3 hrs            | 40+10=50       |
| 9      | 5B09ECO      | Research Methods and Techniques for Economic Analysis | V                                      | 4                      | 4                      | 3 hrs            | 30+10★ + 10=50 |
| 10     | 5B10ECO      | Development Economics                                 | V                                      | 4                      | 4                      | 3 hrs            | 40+10=50       |
| 11     | 5B11ECO      | Economics of Banking and Finance                      | V                                      | 4                      | 5                      | 3 hrs            | 40+10=50       |
| 12     | 6B12ECO      | Basic Tools for Economic Analysis-II                  | VI                                     | 4                      | 6                      | 3 hrs            | 40+10=50       |
| 13     | 6B13ECO      | Central Themes in Indian Economy                      | VI                                     | 4                      | 5                      | 3 hrs            | 40+10=50       |
| 14     | 6B14ECO      | Public Economics                                      | VI                                     | 4                      | 6                      | 3 hrs            | 40+10=50       |
| 15     | 6B15ECO      | Basic Econometric Analysis                            | VI                                     | 4                      | 5                      | 3 hrs            | 40+10=50       |
|        | 6B16ECO (Pr) | Project                                               | VI                                     | 2                      | 3                      | -----            | 20+5=25        |

★Computer Practical

**B A DEVELOPMENT ECONOMICS PROGRAMME  
CORE COURSES STRUCTURE**

| Sl. No | Course Code        | Name of the paper                                     | Semester in which the paper is offered | Credits for each paper | Contact hours per week | Examination Time | Marks          |
|--------|--------------------|-------------------------------------------------------|----------------------------------------|------------------------|------------------------|------------------|----------------|
| 1      | 1B01ECO            | Micro Economic Analysis-I                             | I                                      | 5                      | 6                      | 3 hrs            | 40+10=50       |
| 2      | 2B02ECO            | Micro Economic Analysis-II                            | II                                     | 4                      | 6                      | 3 hrs            | 40+10=50       |
| 3      | 3B03ECO            | Macro Economic Analysis-I                             | III                                    | 5                      | 5                      | 3 hrs            | 40+10=50       |
| 4      | 3B04ECO            | International Economics                               | III                                    | 4                      | 4                      | 3 hrs            | 40+10=50       |
| 5      | 4B05ECO            | Macro Economic Analysis-II                            | IV                                     | 4                      | 5                      | 3 hrs            | 40+10=50       |
| 6      | 4B06ECO            | Environmental Economics                               | IV                                     | 4                      | 4                      | 3 hrs            | 40+10=50       |
| 7      | 5B07ECO            | Basic Tools for Economic Analysis-I                   | V                                      | 4                      | 6                      | 3 hrs            | 40+10=50       |
| 8      | 5B08ECO            | Alternative Economics                                 | V                                      | 4                      | 4                      | 3 hrs            | 40+10=50       |
| 9      | 5B09ECO            | Research Methods and Techniques for Economic Analysis | V                                      | 4                      | 4                      | 3 hrs            | 30+10* + 10=50 |
| 10     | 5B10DEV<br>ECO     | Economics of Development and Planning -I              | V                                      | 4                      | 4                      | 3 hrs            | 40+10=50       |
| 11     | 5B11ECO            | Economics of Banking and Finance                      | V                                      | 4                      | 5                      | 3 hrs            | 40+10=50       |
| 12     | 6B12ECO            | Basic Tools for Economic Analysis-II                  | VI                                     | 4                      | 6                      | 3 hrs            | 40+10=50       |
| 13     | 6B13DEV<br>ECO     | Economics of Development and Planning -II             | VI                                     | 4                      | 5                      | 3 hrs            | 40+10=50       |
| 14     | 6B14ECO            | Public Economics                                      | VI                                     | 4                      | 6                      | 3 hrs            | 40+10=50       |
| 15     | 6B15ECO            | Basic Econometric Analysis                            | VI                                     | 4                      | 5                      | 3 hrs            | 40+10=50       |
|        | 6B16DEV<br>ECO(Pr) | Project                                               | VI                                     | 2                      | 3                      |                  | 20+05=25       |

★Computer Practical



**B A ECONOMICS/DEVELOPMENT ECONOMICS PROGRAMME  
COMPLEMENTARY COURSES**

| <b>Sl. No</b> | <b>Course Code</b> | <b>Name of the paper</b>                                    | <b>Semester in which the paper is offered</b> | <b>Credits for each paper</b> | <b>Contact hours per week</b> | <b>Examination Time</b> | <b>Marks</b> |
|---------------|--------------------|-------------------------------------------------------------|-----------------------------------------------|-------------------------------|-------------------------------|-------------------------|--------------|
| 1             | 1C01ECO            | Mathematics for Economic Analysis-I                         | I                                             | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 2             | 2C02ECO            | Mathematics for Economic Analysis-II                        | II                                            | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 3             | 3C03ECO            | Mathematical Economics-I                                    | III                                           | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 4             | 4C04ECO            | Mathematical Economics-II                                   | IV                                            | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 5             | 1C05ECO            | Introductory Economics-I(Non Economics Programmes Only)     | I                                             | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 6             | 2C06ECO            | Introductory Economics-II(For Non Economic Programmes Only) | II                                            | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 7             | 3C07ECO            | History of Economic Thought-I                               | III                                           | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 8             | 4C08ECO            | History of Economic Thought-II                              | IV                                            | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 9             | 1C09ECO            | Population Studies                                          | I                                             | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 10            | 2C10ECO            | Regional Economics                                          | II                                            | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 11            | 3C11ECO            | Agricultural Economics                                      | III                                           | 4                             | 6                             | 3 hrs                   | 40+10=50     |
| 12            | 4C12ECO            | Gender Economics                                            | IV                                            | 4                             | 6                             | 3 hrs                   | 40+10=50     |

**B A ECONOMICS/DEVELOPMENT ECONOMICS  
OPEN COURSES**

Six open Courses are listed during the V Semester. The Colleges have the freedom to select any one of the Open Courses.

**SEMESTER-V**

| <b>Sl. No</b> | <b>Course Code</b> | <b>Name of the paper</b>        | <b>Semester in which the paper is offered</b> | <b>Credits for each paper</b> | <b>Contact hours per week</b> | <b>Examination Time</b> | <b>Marks</b> |
|---------------|--------------------|---------------------------------|-----------------------------------------------|-------------------------------|-------------------------------|-------------------------|--------------|
| 1             | 5D01ECO            | Economics of Travel and Tourism | V                                             | 2                             | 2                             | 2hrs                    | 20+5=25      |
| 2             | 5D02ECO            | Kerala Economy                  | V                                             | 2                             | 2                             | 2 hrs                   | 20+5=25      |
| 3             | 5D03ECO            | Economics of Share Market       | V                                             | 2                             | 2                             | 2hrs                    | 20+5=25      |

**B.A.ECONOMICS/DEVELOPMENT ECONOMICS**  
**COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM**  
**(Effective from 2014-2015)**

**Semester I**

| <b>Course Code</b>       | <b>Course Category</b>      | <b>Course Title</b>             | <b>Hour</b> | <b>Credit</b> | <b>Examination Time</b> |
|--------------------------|-----------------------------|---------------------------------|-------------|---------------|-------------------------|
| 1A01ENG                  | Common Course<br>(English)  | -<br>-----                      | 5           | 4             | 3hrs                    |
| 1A02ENG                  | Common Course<br>(English)  | -----                           | 4           | 3             | 3hrs                    |
| 1A07/MAL/HIN/ARB/<br>URD | Common Course<br>(Language) | -----                           | 4           | 4             | 3hrs                    |
| 1B01ECO                  | Core Course                 | Micro<br>Economic<br>Analysis-1 | 6           | 5             | 3hrs                    |
| IC                       | Complementary<br>Course     |                                 | 6           | 4             | 3hrs                    |

**B.A.ECONOMICS/DEVELOPMENT ECONOMICS**  
**COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER**  
**SYSTEM**  
**(Effective from 2014-2015)**

**Semester II**

| <b>Course Code</b>       | <b>Course Category</b>      | <b>Course Title</b>           | <b>Hour</b> | <b>Credit</b> | <b>Examination Time</b> |
|--------------------------|-----------------------------|-------------------------------|-------------|---------------|-------------------------|
| 2A03ENG                  | Common Course<br>(English)  | -----                         | 5           | 4             | 3hrs                    |
| 2A04ENG                  | Common Course<br>(English)  | -----                         | 4           | 3             | 3hrs                    |
| 2A08/MAL/HIN/ARB/<br>URD | Common Course<br>(Language) | -----                         | 4           | 4             | 3hrs                    |
| 2B02ECO                  | Core Course                 | Micro economic<br>Analysis-11 | 6           | 4             | 3hrs                    |
| 2C                       | Complementary<br>Course     |                               | 6           | 4             | 3hrs                    |

**B.A.ECONOMICS/DEVELOPMENT ECONOMICS**  
**COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM**  
**(Effective from 2014-2015)**  
**Semester III**

| <b>Course Code</b>   | <b>Course Category</b>   | <b>Course Title</b>      | <b>Hour</b> | <b>Credit</b> | <b>Examination Time</b> |
|----------------------|--------------------------|--------------------------|-------------|---------------|-------------------------|
| 3A05ENG              | Common Course (English)  | -----                    | 5           | 4             | 3hrs                    |
| 3A09/MAL/HIN/ARB/URD | Common Course (Language) | -----                    | 5           | 4             | 3hrs                    |
| 3B03ECO              | Core Course              | Macroeconomic Analysis-1 | 5           | 5             | 3hrs                    |
| 3B04ECO              | Core Course              | International Economics  | 4           | 4             | 3hrs                    |
| 3C                   | Complementary Course     | -----                    | 6           | 4             | 3hrs                    |

**B.A.ECONOMICS/DEVELOPMENT ECONOMICS**  
**COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM**  
**(Effective from 2014-2015)**  
**Semester IV**

| <b>Course Code</b>   | <b>Course Category</b>   | <b>Course Title</b>        | <b>Hour</b> | <b>Credit</b> | <b>Examination Time</b> |
|----------------------|--------------------------|----------------------------|-------------|---------------|-------------------------|
| 4A06ENG              | Common Course (English)  | -----                      | 5           | 4             | 3hrs                    |
| 4A10/MAL/HIN/ARB/URD | Common Course (Language) | -----                      | 5           | 4             | 3hrs                    |
| 4B05ECO              | Core Course              | Macro economic Analysis-11 | 5           | 4             | 3hrs                    |
| 4B06ECO              | Core Course              | Environmental Economics    | 4           | 4             | 3hrs                    |
| 4C                   | Complementary Course     | -----                      | 6           | 4             | 3hrs                    |

**B.A.ECONOMICS**  
**COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM**  
**(Effective from 2014-2015)**  
**Semester V**

| <b>Course Code</b> | <b>Course Category</b> | <b>Course Title</b>                                   | <b>Hour</b> | <b>Credit</b> | <b>Examination Time</b> |
|--------------------|------------------------|-------------------------------------------------------|-------------|---------------|-------------------------|
| 5DECO              | Open Course            | -----                                                 | 2           | 2             | 2hrs                    |
| 5B07ECO            | Core Course            | Basic Tools for Economic Analysis-1                   | 6           | 4             | 3hrs                    |
| 5B08ECO            | Core Course            | Alternative Economics                                 | 4           | 4             | 3hrs                    |
| 5B09ECO            | Core Course            | Research Methods and Techniques for Economic Analysis | 4           | 4             | 2hrs+Practicals         |
| 5B10ECO            | Core Course            | Development Economics                                 | 4           | 4             | 3hrs                    |
| 5B11ECO            | Core Course            | Economics of Banking and Finance                      | 5           | 4             | 3hrs                    |

**B.A. DEVELOPMENT ECONOMICS**  
**COURSE STRUCTURE UNDER CHOICE BASED CREDIT SEMESTER SYSTEM**  
**(Effective from 2014-2015)**  
**Semester V**

| <b>Course Code</b> | <b>Course Category</b> | <b>Course Title</b>                                   | <b>Hour</b> | <b>Credit</b> | <b>Examination Time</b> |
|--------------------|------------------------|-------------------------------------------------------|-------------|---------------|-------------------------|
| 5D ECO             | Open Course            | -----                                                 | 2           | 2             | 2hrs                    |
| 5B07ECO            | Core Course            | Basic Tools for Economic Analysis-1                   | 6           | 4             | 3hrs                    |
| 5B08ECO            | Core Course            | Alternative Economics                                 | 4           | 4             | 3hrs                    |
| 5B09ECO            | Core Course            | Research Methods and Techniques for Economic Analysis | 4           | 4             | 2hrs+Practicals         |
| 5B10DEVECO         | Core Course            | Economics of Development and Planning-1               | 4           | 4             | 3hrs                    |
| 5B11ECO            | Core Course            | Economics of Banking and Finance                      | 5           | 4             | 3hrs                    |

**B.A.ECONOMICS**  
**COURSE STRUCTURE UNDER CHOICE BASED CREDIT SYSTEM**  
**(Effective from 2014-2015)**  
**Semester VI**

| <b>Course Code</b> | <b>Course Category</b> | <b>Course Title</b>                  | <b>Hour</b> | <b>Credit</b> | <b>Examination Time</b> |
|--------------------|------------------------|--------------------------------------|-------------|---------------|-------------------------|
| 6B12ECO            | Core Course            | Basic Tools for Economic Analysis-II | 6           | 4             | 3hrs                    |
| 6B13ECO            | Core Course            | Central Themes in Indian Economy     | 5           | 4             | 3hrs                    |
| 6B14ECO            | Core Course            | Public Economics                     | 6           | 4             | 3hrs                    |
| 6B15ECO            | Core Course            | Basic Econometric Analysis           | 5           | 4             | 3hrs                    |
| 6B16ECO(Pr)        | Core Course            | Project                              | 3           | 2             |                         |

**B.A.DEVELOPMENT ECONOMICS**  
**COURSE STRUCTURE UNDER CHOICE BASED CREDIT SYSTEM**  
**(Effective from 2014-2015)**  
**Semester VI**

| <b>Course Code</b> | <b>Course Category</b> | <b>Course Title</b>                      | <b>Hour</b> | <b>Credit</b> | <b>Examination Time</b> |
|--------------------|------------------------|------------------------------------------|-------------|---------------|-------------------------|
| 6B12ECO            | Core Course            | Basic Tools for Economic Analysis-II     | 6           | 4             | 3hrs                    |
| 6B13DEVECO         | Core Course            | Economics of Development and Planning-11 | 5           | 4             | 3hrs                    |
| 6B14ECO            | Core Course            | Public Economics                         | 6           | 4             | 3hrs                    |
| 6B15ECO            | Core Course            | Basic Econometric Analysis               | 5           | 4             | 3hrs                    |
| 6B16 DEVECO (Pr)   | Core Course            | Project                                  | 3           | 2             |                         |

***BA ECONOMICS/BA  
DEVELOPMENT ECONOMICS  
SYLLABUS-2014***

# ***CORE COURSES***



|                        |                                     |
|------------------------|-------------------------------------|
| <b>Course Title</b>    | <b>: MICRO ECONOMIC ANALYSIS- I</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                |
| <b>Credit</b>          | <b>: 5 (108 contact hours)</b>      |
| <b>Course Code</b>     | <b>: 1 B 01 ECO</b>                 |
| <b>Semester</b>        | <b>: I</b>                          |

### **Course Objective:**

This course helps students acquaint and equip themselves with the basic theories and concepts that the mainstream economic literature introduced as tools of decision making. Knowledge of these theories and concepts are prerequisites for higher education in Economics, and thus, this course will help build the foundation for higher education. Learning this course will help scholars understand how economic agents take decisions and how they would respond to changes in economic phenomena.

### **SYLLABUS**

**Module 1:** Definition of Economics – Scope and Subject Matter of Microeconomics – Scarcity and Choice – Tradeoffs and Opportunity Costs - Role of Economic Theory – Economic Model – Rational Behaviour – Uses of Price Theory - Market Signals as Guidelines to Optimal Allocation of Resources – Market Forces – Demand and Supply – Equilibrium - Government Interferences – Price Ceilings and Price Floors – (15 Hours)

**Module 2:** Consumer Choice - Use Value and Exchange Value – Cardinal Utility Approach to Consumer Choice – Total and Marginal Utility - Water Diamond Paradox – Law of Diminishing Marginal Utility – Optimal Purchase Rule – From Marginal Utility to the Demand Curve - Water Diamond Paradox Resolved – Ordinal Utility Approach to Consumer Choice – Indifference Curve Analysis – PCC and Effects of Changes in Price – Income and Substitution Effect of Price Change - Slutsky’s Law - Derivation of Demand Curve - ICC and Effects of Changes in Income – PCC and ICC of Normal and Inferior Goods – Giffen Paradox – Demand Curves of Inferior and Giffen Goods – Cardinal and Ordinal Analysis of Consumer Surplus – Behaviourist Approach to Consumer Choice - Revealed Preference Hypothesis – Limitations of Traditional Theories of Consumer Choice - (30 Hours)

**Module 3:** Demand and Supply – Partial Equilibrium Analysis - The Law of Demand - Individual to Market Demand – Demand Function – Shift Factors - Changes in Demand and Changes in Quantity Demanded – The Law of Supply - Individual to Market Supply - Supply Function – Shift Factors - Changes in Supply and Changes in Quantity Supplied – Elasticity of Demand and Supply – Types, Measurement and Factors Determining Elasticity – TR, MR, AR, Monopoly Power and Price Elasticity of Demand – Demand and Supply Interaction – Excess Demand and Supply – Effects of

Shifts in Supply and Demand on Price and Quantity – Limitations of Supply and Demand Analysis – (25 Hours)

**Module 4:** Production and Costs – Role of Firm – Production Function of Single and Multi Product Firms – TP, MP, AP and Input Elasticity of Output – Isoquants, Iso-cost Lines, PPC and Iso-revenue Lines - Returns to Variable Factor and Returns to Scale - Laws of Production – Law of Variable Proportions and Laws of Returns to Scale – Technical Progress and Production Function - Optimal Choice of Firms – Constrained and Unconstrained Equilibrium of Firms - Optimal Expansion Path – Linear Programming – Graphical Method – Costs – Traditional and Alternative Approaches to Costs – Short run and Long run Cost Curves – Reserve Capacity and Costs – Economies of Scale and Cost Curves – U-shaped and L-shaped Cost Curves (38 Hours)

Abbreviations Expanded:

ICC = Income Consumption Curve

PCC = Price Consumption Curve

TR = Total Revenue

MR = Marginal Revenue

AR = Average Revenue

TP = Total Product

MP = Marginal Product

AP = Average Product

PPC = Production Possibility Curve

### **Reference Books**

1. Koutsoyiannis A (1982), “Modern Microeconomics” - Macmillan.
2. David C. Colander, ‘Economics’ – McGraw Hill Irwin
3. William J. Baumol and Alan S. Blinder, ‘Economics; Principles and Policy’ – Harcourt Brace Jovanovich Publishers
4. N. Gregory Mankiw, ‘Microeconomics’ – Worth Publishers
5. G. C. de Costa, ‘Value and Distribution in Classical and Neoclassical System’
6. Watson D.S and Getz M (1986), ‘Price Theory and its Uses’. Khosla Publishing House New Delhi.
7. Varian H.R (2006), “Intermediate Microeconomics: A Modern Approach”, East West Press, New Delhi.
8. R. Glenn Hubbard & Anthony Patrick O. Brien, ‘Microeconomics’, Pearson
9. Hirshleifer J, Glazes A and Hirshleifer D, (2012), ‘Price Theory and its Applications’, Cambridge University Press.

|                        |                                       |
|------------------------|---------------------------------------|
| <b>Course Title</b>    | <b>: MICRO ECONOMIC ANALYSIS – II</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                  |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>        |
| <b>Course Code</b>     | <b>: 2 B02 ECO</b>                    |
| <b>Semester</b>        | <b>: II</b>                           |

### **Course Objective:**

This course, as a continuation of Microeconomics-I, helps students extend their knowledge in basic theories and concepts that the mainstream economic literature introduced as tools of decision making. Knowledge of these theories and concepts are prerequisites for higher education in Economics, and thus, this course will help build the foundation for higher education. Learning this course will help the students to understand how economic agents take decisions and how they would respond to changes in economic phenomena.

### **SYLLABUS**

**Module 1:** Market Structures – Classification of Markets - Neoclassical Models of Market – Profit Maximising Firms - Marginalist Rule - Extreme Market Situations – Perfect competition and Monopoly – Model of Perfect Competition - Necessary Conditions and Features – Short run and Long run Equilibrium of the Firm and Industry – Economic Efficiency and Social Welfare - Model of Monopoly – Necessary Conditions and Features – Monopolist’s Price, Output and Profit – Discriminating Monopolist - Welfare Loss from Monopoly - Causes of Monopoly – Controlling Monopoly – Effects of Changes in Cost and Revenue on Monopolist’ and Competitive Firm’s Equilibrium - Comparison of Monopoly with Perfect Competition - Monopsony and the Evil of Buyer’s Dominance – (38 Hours)

**Module 2:** Market Structures between Perfect Competition and Monopoly – Monopolistic Competition – Necessary Conditions and Features - Chamberlin’s Large Group Model – Short run and Long run Equilibrium of the Firm and Product Group – Economic Efficiency and Social Welfare – Effects of Changes in Cost and Revenue on Monopolistic Competitive Firm’s Equilibrium - Comparison of Monopolistic Competition with Perfect Competition - Oligopoly - Necessary Conditions and Features - Classical Non-Collusive Oligopoly Models - Cournot Model – Bertrand Model - Chamberlin’s Small Group Model – Sweezy’s Model and Price Rigidity – Indeterminacy of Price and Output under Bilateral Monopoly – (37 Hours)

**Module 3:** Factor Markets – Derived Demand - Functional and Personal Distribution of Income – Factor Pricing - Demand for and supply of factors – Marginal Revenue Product and Value of Marginal Product – Marginal and Average Factor Cost – Marginal Productivity Theory - Product Exhaustion Theorem - Factor Pricing under Perfect Competition and Imperfect Competition – Monopolistic and Monopsonistic Exploitation - Market Wage and Subsistence Wage - Rent and Quasi Rent - Accounting Profit and Economic Profit – Profit as Residual Surplus – Competition and Normal Profit - Natural and Market Rate of Interest – (18 Hours)

**Module 4:** Social Welfare – Welfare Economics - Criteria of Social Welfare – Social welfare function – Maximisation of Social Welfare - Determination of Welfare Maximising Output – Welfare Maximisation and Perfect Competition – (15 Hours)

**Reference Books**

1. Koutsoyiannis A (1982): “Modern Microeconomics” - Macmillan.
2. David C. Colander, ‘Economics’ – McGraw Hill Irwin
3. William J. Baumol and Alan S. Blinder, ‘Economics; Principles and Policy’ – Harcourt Brace Jovanovich Publishers
4. N. Gregory Mankiw, ‘Microeconomics’ – Worth Publishers
5. G. C. de Costa, ‘Value and Distribution in Classical and Neoclassical System’
6. Watson D.S and Getz M (1986): ‘Price Theory and its Uses’. Khosla Publishing House New Delhi.
7. Varian H.R (2006): “Intermediate Microeconomics: A Modern Approach”, East West Press, New Delhi.
8. R. Glenn Hubbard & Anthony Patrick O. Brien, ‘Microeconomics’, Pearson
9. Hirshleifer J, Glazes A and Hirshleifer D, (2012), ‘Price Theory and its Applications’, Cambridge University Press.

|                        |                                      |
|------------------------|--------------------------------------|
| <b>Course Title</b>    | <b>: MACRO ECONOMIC ANALYSIS – I</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                 |
| <b>Credit</b>          | <b>: 5 (90 contact hours)</b>        |
| <b>Course Code</b>     | <b>: 3 B 03- ECO</b>                 |
| <b>Semester</b>        | <b>: III</b>                         |

### **Course Objective**

This course helps students acquaint and equip themselves with the basic macroeconomic theories and concepts. It enables them to understand the working of the economy at the aggregate level. It will also help them to critically analyze the alternative economic policies required to develop suitable solutions to various economic problems of their society and economy.

### **SYLLABUS**

**Module 1:** Definition of Macroeconomics – Differences between Macroeconomics and Microeconomics – Evolution of Macroeconomics until now – Circular and Cyclical Trends of Macroeconomic Variables - Circular Flow of Income and Expenditure - Estimation of National Income – Cyclical Fluctuations in Output and Employment - (15 Hours)

**Module 2:** Analysis of Classical Macroeconomic Model – Classical Model of Full Employment – Flexible Wage, Price and Interest Rate – Labour Market Equilibrium – Saving Investment Equality – Say’s Law – Fisher’s Equation of Exchange - Neutrality of Money – Classical Dichotomy – Aggregate Supply and Demand – Equilibrium of the Economy with Output at Potential Level – Self Regulating Mechanism and Economic Stability – Laissez faire policy - Relevance of Classical policy measures in the contemporary world. (20 Hours)

**Module 3:** Analysis of Keynesian Macroeconomic Model - Keynesian Model of Underemployment Equilibrium – Money Illusion - Downward Nominal Wage Rigidity and Labour Market Equilibrium – Involuntary Unemployment - Saving Investment Equality - Aggregate Supply and Demand – Determination of Equilibrium Income – Economic Instability - Infinite Interest Elasticity of Demand for Money – Interest Inelasticity of Investment - Role of Fiscal and Monetary Policy Measures - Secular Stagnation – Relevance of Keynesian policy measures in the contemporary world. (30 Hours)

**Module 4:** Analysis of Consumption and Investment Behaviour of Households and Firms – Consumption Function – Absolute Income Hypothesis – Relative Income Hypothesis – Life Cycle Hypothesis – Permanent Income Hypothesis – Role of Consumption in Classical and Keynesian Models - Investment Function – Interest Elasticity of Investment – Response of Investment to Expected Return – Autonomous and Induced Investments - Multiplier and Accelerator – Volatility of Investment - Role of Government Expenditure – Balanced and Unbalanced Budget and Multiplier Effect - (25 Hours)

### **Reference Books:**

1. C. Rengarajan and B. H. Dholakia, ‘Principles of Macroeconomics’ – Tata McGraw Hill Education Private Limited
2. Edward Shapiro, ‘Macroeconomic Analysis’ – Galgotia

3. Rosalind Levacic and Alexander Reibmann, 'Macroeconomics; An Introduction to Keynesian – Neoclassical Controversies' – Macmillan
4. Robert J. Gordon, 'Macroeconomics' - Harper Collins College Publishers
5. N. Gregory Mankiw, 'Macroeconomics' – Worth Publishers
6. Richard T. Froyen, 'Macroeconomics; Theories and Policies' – Pearson
7. O. Sullivan, Sheffrin and Perez, 'Macroeconomic', Pearson.
8. Andrew B. Abel, Ben S. Bernanke Dean Coughore, 'Macroeconomics', Pearson.

|                        |                                  |
|------------------------|----------------------------------|
| <b>Course Title</b>    | <b>: INTERNATIONAL ECONOMICS</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>             |
| <b>Credit</b>          | <b>: 4 (72 contact hours)</b>    |
| <b>Course Code</b>     | <b>: 3B 04 ECO</b>               |
| <b>Semester</b>        | <b>: III</b>                     |

### **Course Objectives**

International Economics deals with the economic and financial interdependence among nations. The economic actions of many of the business firms and government organizations are affected directly or indirectly by international economic events. Hence, this course in International Economics will present students with most of the questions and their answers related to international economic problem. The Course will cover most of the theories of international trade, international economic integration, trade and growth, balance of payments and international monetary system etc. The students are expected to learn by the completion of the course most of the issues and their solution with regard to international trade. It will also help those students who plan to go for higher studies and research in the field of International Economics.

### **SYLLABUS**

#### **Module I: Introduction to International Economics**

Meaning, nature and contents of international economics. Importance of the study of international economics, International and inter regional trade, Theories of absolute advantage, comparative advantage, Heckscher-Ohlin theory [10 hours]

**Module 2: Terms of Trade** Terms of trade & its importance, importance and limitations in the theory of trade- Free trade Vs protection- methods of trade restrictions- tariff barriers and new protectionism, trade liberalization and its implications. [17 hours]

#### **Module 3: Balance of Trade and Balance of Payments**

Meaning and definition of balance of trade and balance of payments--balance of payments equilibrium and disequilibrium. Methods of correcting adverse balance of payments [10 hours]

**Module 4: Foreign Exchange** The foreign exchange rate-fixed and flexible, Theories of exchange rate determination, the Mint parity theory, the purchasing power parity theory, demand and supply analysis. [20hours]

**Module 5: International Financial System** The Brettonwoods system, IMF and World Bank, WTO, International capital movements, foreign direct investment, foreign portfolio investment, welfare implications, gains from international policy coordination. [15hours]

#### **Reference Books**

##### **Module I:**

1. Dominic Salvatore – International Economics

2. Sodersten B.O and Geoffrey Reed – International Finance
3. Paul Krugman and Maurice Obstfeld – International Economics
4. Dominic Salvatore – Theory and Problems of International Economics

**Module 2:**

1. Francis Cherunilam- International Economics
2. Rana and Varma- International Economics
3. Dominic Salvatore – International Economics
4. Sodersten B.O and Geoffrey Reed – International Finance
5. Henry Thompson- International Economics ,global markets and competition ,Cambridge University ,Press India Pvt Ltd 2010

**Module 3:**

1. Thomas Pugell- International Economics
2. Francis Cherunilam- International Economics
3. Dominic Salvatore – International Economics
4. Sodersten B.O and Geoffrey Reed – International Finance

**Module 4:**

1. Francis Cherunilam- International Economics
2. Dominic Salvatore – International Economics
3. Sodersten B.O and Geoffrey Reed – International Finance
4. M.C. Vaish and Sudhama Singh- International Economics
5. Henry Thompson- International Economics, global markets and competition, Cambridge University, Press India Pvt Ltd 2010

**Module 5:**

1. Dominic Salvatore – International Economics
2. Sodersten B.O and Geoffrey Reed – International Finance
3. Francis Cherunilam- International Economics
4. Paul Krugman and Maurice Obstfeld – International Economics
5. Dominic Salvatore – Theory and Problems of International Economics



|                        |                                       |
|------------------------|---------------------------------------|
| <b>Course Title</b>    | <b>: MACRO ECONOMIC ANALYSIS – II</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                  |
| <b>Credit</b>          | <b>: 4 (90 contact hours)</b>         |
| <b>Course Code</b>     | <b>: 4 B05 ECO</b>                    |
| <b>Semester</b>        | <b>: 1V</b>                           |

### **Course Objective**

This course, as a continuation of Macroeconomics-I, will help students to acquaint and equip themselves with the basic macroeconomic theories and concepts. It will enable them to understand the working of the economy at the aggregate level. It will also help them to critically analyze the alternative economic policies required to develop suitable solutions to various economic problems of the society and economy.

### **SYLLABUS**

**Module 1:** Neoclassical Synthesis - Integration of Real and Monetary Sectors - Hicks Hansen Synthesis – One Sector Neoclassical Model (Quantity Theory of Money) and Simple One Sector Keynesian model – Basic ISLM Model – IS Curve and Real Sector (Derivation of the Equation and Curve) – LM Curve and Monetary Sector (Derivation of the Equation and Curve) – General Equilibrium – Shifts in the IS and LM Curves - Limitations of the Basic ISLM Model – (25 Hours)

**Module 2:** Inflation and Unemployment – Meaning and Definition of Inflation – Types of Inflation – Causes of Inflation – Inflationary Gap - Disinflation and Sacrifice Ratio – Interest Rate and Inflation - Meaning and Definition of Unemployment - Types of Unemployment – Natural Rate of Unemployment - Relation between Inflation and Unemployment – Phillips Curve and U-I Tradeoff – Stagflation and U-I Tradeoff - Short run and Long run Phillips Curves - Fiscal and Monetary Policies as weapons against Inflation and Unemployment. (25 Hours)

**Module 3:** Trade Cycles - Meaning and Definition of Trade Cycles – Phases of Trade Cycles – Shorter and Longer Cycles - Theories of Trade Cycles – Hawtrey’s Theory – Hayek’s Theory – Keynesian Theory – Multiplier Accelerator Integration – Monetarist Interpretation of Trade Cycles - Contra Cyclical Policy Measures. (20 Hours)

**Module 4:** Money - Meaning and Definition of Money – Functions of Money – Types of Money - Demand for Money – Quantity Theory of Money – Transaction and Cash Balance Approaches – Restatement of Quantity Theory – Portfolio Theories of Money Demand - Supply of Money – Inside and Outside Money – Monetary Base – Fiat Money - Seigniorage - Money Multiplier – Controlling the Money Supply (20 Hours).

## **Reference Books**

1. Edward Shapiro, 'Macroeconomic Analysis' – Galgotia
2. Rosalind Levacic and Alexander Rebmann, 'Macroeconomics; An Introduction to Keynesian – Neoclassical Controversies' – Macmillan
3. Robert J. Gordon, 'Macroeconomics'- Harper Collins College Publishers
4. N. Gregory Mankiw, 'Macroeconomics' – Worth Publishers
5. Richard T. Froyen, 'Macroeconomics; Theories and Policies' – Pearson
6. O. Sullivan, Sheffrin and Perez, 'Macroeconomic', Pearson.
7. Andrew B. Abel, Ben S. Bernanke Dean Coughore, 'Macroeconomics', Pearson

|                        |                                  |
|------------------------|----------------------------------|
| <b>Course Title</b>    | <b>: ENVIRONMENTAL ECONOMICS</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>             |
| <b>Credit</b>          | <b>: 4 (72 contact hours)</b>    |
| <b>Course Code</b>     | <b>: 4 B 06 ECO</b>              |
| <b>Semester</b>        | <b>: 1V</b>                      |

### **Course Objectives**

This paper aims at providing an exposure to the students in the basics of environmental economics and its conceptual foundations. It provides the necessary training to the students of economics and equips them to deal with issues in the environmental sectors. It will assist the students to analyze the issues and to develop solutions for policy purposes. The aim of this course is to equip the students to apply economic tools and methods to minimize environmental damages.

### **SYLLABUS**

#### **Module 1**

Introduction to Environmental Economics: Meaning and scope of environmental Economics, The Evolution and growth of Environmental Economics. Relationship between environmental economics and Economics, Ecological Economics and Resource Economics. Role of Economics in Environmental Management (Material Balance Model and laws of thermodynamics). Individual preference regarding Environmental protection (Biocentrism, Anthropocentrism), Environment and ethics. (15 hours)

#### **Module 2**

Market Failure: Public Goods and Bads, Externalities, Property Rights , Tragedy of Commons, The Coase Theorem. The concept of sustainable Development – weak sustainability, strong sustainability, Indicators of sustainable development, World Commission on sustainable development. (15 hours)

#### **Module 3**

Economic Incentives for Environmental Protection: Economic instruments - Polluters pay principle, Pigovian tax, Carbon tax, environmental subsidies, Deposit/refund system , Quantity rationing. Command and Control. Valuing the Environment: Meaning and types of environmental Values(use value, non use value, existence value etc.), Measures of Economic Valuation- Market valuation, Contingent Valuation Method, Replacement Cost and preventive method, Travel cost Method, Tourism Expenditure Method, Hedonic Pricing Method. (27 hours)

**Module 4** Global environmental problems : Pollution- air, water, soil, nuclear, marine, solid waste, e-waste. Loss of biodiversity, deforestation, desertification, Climate change and Global warming. Climate change and India. Environmental problems facing India and Kerala (should include Bhopal gas tragedy and current problems like Environmental issues connected with Western Ghats, river bed sand mining etc. (15 hours)

**Reference Books**

1. Charles D Kolstad, 2000, Environmental Economics, Oxford University Press (Ch1, 3, 5, 6, )
2. Thomas J. M and Callan S.J(2007), Environmental Economics, Thomas Learning Inc, Akash Press, New Delhi. (Ch. 1, 4, 5, 6, 8)
3. Nick Hanley, Jason F Shogren & Ben White(1997), Environment Economics- in theory and Practice. Macmillan India Ltd (Ch. 1, 2, 3,13,14)
4. Singh Katar and Shishodia A ( 2007) Environmental Economics, Theory and Applications. Sage Pub. (Ch 1,2,5, 12, 13)
5. John Asafu-Adjaye (2005) Environmental Economics for Non-economists: Techniques and Policies for Sustainable Development. World Scientific Publishing Ptc.Co. (ch. 1,2,4,5, 11)
6. N. Rajalakshmi and Dhukasi Brinda, (1994), Evironomics-Economics of Environment Allied Publication Ahmedabad .
7. Eugene T, (2006) Environment Economics, Vrinda Publication Press, New Delhi
8. Barry C Field and Martha K Field, Environmental Economics-An Introduction. McGraw Hill.
9. Guy Garrod and Kenneth G Willis, (1999) Economic Valuation of the Environment. Edward.Elgar publishing Ltd, USA (Module III)
10. Eban S Goodstein, (2005) Economics and the Environment ISBN (Module I)
11. K V. Pavithran; “A text book of environmental economics”-New age international publishers- New Delhi.

|                        |                                                |
|------------------------|------------------------------------------------|
| <b>Course Title</b>    | <b>: BASIC TOOLS FOR ECONOMIC ANALYSIS – I</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                           |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>                 |
| <b>Course Code</b>     | <b>: 5 B07 ECO</b>                             |
| <b>Semester</b>        | <b>: V</b>                                     |

### **Course Objectives**

This course is expected to provide students with an elementary introduction to statistical tools and mathematical concepts that are used in the study of Economics in UG level. This course will cover essential elementary topics in Statistics and mathematics. The basic aim of the course is to develop skills in applying statistical techniques and mathematical concepts that are indispensable for the in-depth study of theoretical as well as empirical economics.

### **SYLLABUS**

#### **Module I: Elementary Mathematics**

Number system, laws of indices, logarithm, arithmetic and geometric series, compound growth rate. Equations: Single and system of linear equations, quadratic equations and their solution. Examples from economics – market equilibrium (35 hours).

**Module 2: Elementary set theory** Set theory: Concept, types, operations, Cartesian product, relations and functions, graphs, application in economics. Cost, revenue, total product, average cost, demand and supply curves (20 hours).

**Module 3: Description of Data** Collection of data: Data types, Nature of Data – Population, Sample, Types of sampling. Classification of data: Tables, Frequency distributions. Presentation of data: Histograms, polygon, frequency curves, bar and pie diagrams. Analysis and interpretation of data: Measures of central value, dispersion, partition values, skewness, kurtosis, Lorenz curve, Gini coefficient (35 hours).

**Module 4: Basic Probability** Meaning and approaches, definition of probability, addition theorem, conditional probability, independence of events and multiplication theorem, simple examples (18 hours)

#### **Reference Books**

1. Allen R.G.D. (1956): Mathematical Analysis for Economists, McMillan
2. David Bowers (1991): Statistics for Economics and Business, McMillan
3. Gupta S.P.(2008): Statistical Methods, Sultan Chand, New Delhi
4. Monga G.S. (2000): Mathematics and Statistics for Economics, Vikas Publishing House, New Delhi
5. Srinath Baruah (2001): Basic Mathematics and its applications in Economics, McMillan

|                        |                                |
|------------------------|--------------------------------|
| <b>Course Title</b>    | <b>: ALTERNATIVE ECONOMICS</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>           |
| <b>Credit</b>          | <b>: 4 (72 contact hours)</b>  |
| <b>Course Code</b>     | <b>: 5 B08 ECO</b>             |
| <b>Semester</b>        | <b>: V</b>                     |

### **Course Objectives:**

This paper intends to introduce students of economics to a few alternative approaches to neo-classical economics. The course essentially intends to teach methodological departures and the possibilities to think differently.

### **SYLLABUS**

**Module I Introduction** Current trends in Economics (econometrics, Neuro economics) - Critique of Mainstream economics. (7 hours)

#### **Module 2 Marxian Critique of Neo Classical Economics**

Critique of Political Economy - Relevance of Marxian Economics in the Contemporary Capitalist World – Capitalism and Crises – Disproportionality and Under consumption - Marx’s Method – Dialectical Materialism – Mode of Production –Capitalist Production – Surplus Value – Organic Composition of Capital – Declining Rate of Profit - Accumulation of Capital – Industrial Reserve Army – Immiserization of the Proletariat – Monopoly Capital – Concentration and Centralization of Capital – Imperialism (25 Hours)

**Module 3 Gender Critique of Neo Classical Economics** Gender Critique: Inception; Debates: Women in Development, Women and Development, Gender and Development - Gender Critique of Neo-Classical Economics: Garry Becker, Diane Elson and Nancy Folbre. (20 Hours)

**Module 4 Environmental Critique of Neoclassical Economics** A brief history of environment in economics, Meaning of ecological economics, Relationship between ecology and neo classical economics, Coevolution of Ecological and Economic System, Steady State Economy, spaceship earth, Limits to Growth, Threats to sustainability, Sustainability in Ecological Economics, Human behavior and economics. (20 hours)

#### **Reference Books**

##### **Module I**

1. David Hausman, *The philosophy of economics an Anthology* (3rd ed), Cambridge university press, 2008.
2. Ernesto Screpanti and Stefano Zamagni, *An Outline of the History of Economic Thought*, Oxford University Press

3. Mark Blaug, *The methodology of economics or how economists explain* (2<sup>nd</sup> ed), Cambridge university press, 1992.

### **Module 2**

1. K. Marx, 1977, '*A Contribution to the Critique of Political Economy*', Progress Publishers, Moscow.
2. Joan Robinson, 1960, '*An Essay on Marxian Economics*', London Macmillan & Co Ltd New York St. Martin's Press., Rosa Luxemburg, '*The Accumulation of Capital*',
3. Paul M. Sweezy, 1942, *Theory of Capitalist Development*, K. P. Bagchi & Company, Ernesto Screpanti and Stefano Zamagni, '*An Outline of the History of Economic Thought*', Oxford University Press

### **Module 3**

1. Rhonda Sharp, 2000, *The Economics and politics of auditing government budgets for their gender impact*, Hawke institute working paper series.
2. Diane Elson, 1999 (june), *Gender Budget Initiatives*, Background papers, common wealth secretariat, UK.
3. Diane Elson, 2006, *Budgeting for women's rights monitoring government budgets for compliance with CEDAW*, by United Nations development fund for women.
4. Rober A Pollak, *Garry Beckers contribution to family and household economics*
5. Lourdes Beneria, 1995, *Towards a greater integration of gender in economics*, World development, vol: 23, No: 11, pp1839-1850.
6. Padmini Swaminathan, 2012, *Reflecting on women's work: some changes large continuities*, Indian journal of labour economics, Vol: 55, No: 3.
7. David Hausman, *The philosophy of economics an Anthology* (3rd ed), Cambridge university press, 2008.

### **Module 4**

1. Common, Michael Sigrid Stagl (2005) *Ecological Economics: An Introduction*, Cambridge University press 2005 (Ch 1,7).
2. Costanz, R, John Cumberland et al ,1997, *An Introduction to Ecological Economics*, .St. Lucie Press. Ch 1,2,3.
3. Daly,E, Herman and Joshua Farley,2011 *Ecological Economics Principles and Application*, 2<sup>nd</sup> Editio., Island Press.(Cha 13)
4. Booth, E Douglas , 1998 ,*The Environmental Consequences of Growth*, RoutledgePub. Ch.8,11
5. Kula, E, (1998), *History of Environmental Economic Thought*, Routledge Pub. (Ch. 9).
6. Nadeau L. Robert, 2003, *The Wealth of Nature. How Mainstream Economics has Failed the Environment*, Columbia University Press. New York Ch. 6.

|                        |                                                                |
|------------------------|----------------------------------------------------------------|
| <b>Course Title</b>    | <b>: RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                                           |
| <b>Credit</b>          | <b>: 4 (72 contact hours)</b>                                  |
| <b>Course Code</b>     | <b>: 5B 09 ECO</b>                                             |
| <b>Semester</b>        | <b>: V</b>                                                     |

### **Course Objectives**

This course introduces methodological differences between different schools of economic thought. It will also introduce students to quantitative and analytical tools required to prepare research projects. Thus the course will provide basic skills required to execute the project work taking account of the most relevant economic theory and available primary or secondary dataset appropriate to the economic phenomena selected for the project work. Since the under graduation and post graduation curriculum includes research project work this course will equip the students to understand different ways of looking at economic issues and different methods to tackle the matter appropriately.

### **SYLLABUS**

#### **Module I Introduction**

What is economics- Nature and significance of economics as science- Positive science and Normative- deductive and inductive methods- Assumptions controversy in economics (Friedman and Samuelson) (10 hours)

#### **Module II Methodology of Economics**

Methodology of economics-Methodological differences across different schools of economic thought: classical (Smith, Ricardo, J S Mill, neo classical, Keynesians, new classical school, Marxian economics, institutional economics, behavioral economics- critique of mainstream economics (17 hours)

#### **Module III Basics of Research in Economics**

Economic theory and method: Axiomatic, mathematical and historical methods-Basic elements in Research-Identification of a research problem- review of literature- framing research questions-Need for hypothesis formation.

Data sources: primary and secondary- Data collection: principles of data collection-analysis of data-report writing: format of report writing, importance of footnotes, bibliography and references, modes of referencing.



Ethics in research: Scientific integrity, Plagiarism (definition of plagiarism- consequences of plagiarism- unintentional plagiarism- forms of plagiarism), Good reference practice, Verification and subsequent use of research material. (27 hours)

**Written examination will be based on first three modules only. (30 marks)**

**Practical examination should be based on fourth and fifth modules worth 10 marks**

#### **Module IV Application of informatics in Economic Analysis**

Basics of M S word-file management-formatting-mail merging-how to create tables-exporting of data from excel sheets to word sheet-power point presentation- use of internet sources for research in economics. (9 hours)

#### **Module V**

MS excel-data entry-formatting cells- creation of tables-elementary calculation: auto sum, average, creating formulae, dragging options- forms of presentation of data: trend line, charts and graphs. (9 hours)

#### **Reference Books**

##### **Module I**

1. Partha Das Gupta, Economics A very short introduction, OUP, 2007
2. Amit Bhaduri, What is the core of economics?, eklavya publication, 2013
3. David Hausman, The philosophy of economics an Anthology (3rd ed), Cambridge university press, 2008.

##### **Module II**

1. David Hausman, The philosophy of economics an Anthology (3rd ed), Cambridge university press, 2008.
2. Mark Blaug, The methodology of economics or how economists explain (2<sup>nd</sup> ed), Cambridge university press, 1992.
3. Eirik G Furubotn and Rudolf Richter, Institutions and Economic theory, university of Michigan press, 2002.
4. Daniel friedman et.al, Emergence of experimental economics, EPW, Vol - XLVI No. 35, August 27, 2011.
5. George VargheseK , Rethinking social sciences and humanities in the contemporary world,EPW, Vol - XLVI No. 31, July 30, 2011

##### **Module III**

1. C T Kurien , A guide to Research, Saugau Publishers,1973
2. Chava Nachimias and David Nachimias , Research methods in social services,1981
3. William j Houde and Pave K Hatt, Methods in social research, Mc graw hill,Kogakusha, 1952.

4. National committees for research Ethics in Norway, Guidelines for research ethics in the social sciences, law and the humanities, 2006

#### **Module IV & V**

1. Rajaraman v, Fundamentals of computers, prentice hall of India, New Delhi, 1996.
2. Lipshultz M M and Lipshultz S, Theory and problems of Data processing, Schaums outline series, Mc graw hill & co., 1982.
3. MLA Handbook for writers of Research Papers (7<sup>th</sup> ed), East-West press Pvt .ltd, Newdelhi, 2009.
4. Informatics Technology in action, Pearson, Dorling Kindersley, 2011

|                        |                                |
|------------------------|--------------------------------|
| <b>Course Title</b>    | <b>: DEVELOPMENT ECONOMICS</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>           |
| <b>Credit</b>          | <b>: 4 (72 contact hours)</b>  |
| <b>Course Code</b>     | <b>: 5 B10- ECO</b>            |
| <b>Semester</b>        | <b>: V</b>                     |

### Course Objectives

This course is intended to create general understanding among students about the theories of development and growth models so as to explain the development or growth process of various countries or states. It will also give an idea about how they are different by giving empirical details of various indicators of growth and development in India in comparison to other parts of the world. At the end of the course the student will be able to understand various developmental issues faced by an economy and place it within the developmental debate.

### SYLLABUS

**Module1 Introduction** Meaning of growth and development- differences-alternative measures of development- documenting the international variation in these measures- (national income, per capita income, PQLI, HDI, GDI,GEM) - Growth vs development debate (10 hours)

**Module 11 Theories of Development** Socio Economic Transformation: Rostow (stage theory) - balanced vs unbalanced theory: big push theory-critical minimum effort theory- Low Level of Equilibrium Trap- Arthur Lewis theory- Nurkse theory (15 hours)

**Module 111 Growth models** Harrod- Domar growth model - Neo- Classical Theory of Growth by Solow- Kaldor's growth model- Schumpeter's innovation theory- Joan Robinson's golden rule of capital accumulation (25 hours)

**Module IV Developmental Challenges** Poverty: poverty measurement, characteristics of the poor, mechanisms that generate poverty traps and path dependence of growth process-Inequality: inequality axioms, inequality measures, link between inequality and development-Unemployment: concept, types of unemployment. (22 hours)

### References Books

1. Amartya kumar Sen, *Growth Economics*, Penguin Education,1970
2. Daron Acemoglu, *Introduction to modern economic growth*, 2008, Princeton university press
3. A N Agarwala and S P Singh, *The economics of underdevelopment*, Oxford university press, 1958.
4. Neri salvadori, *Old and New growth theories An Assessment*, Edward Elgar Publishing limited, 2003

5. A P Thirlwall, *Growth and development, With special reference to developing countries*, (8<sup>th</sup> ed), Palgrave Macmillian, 2006
6. Debraj Ray, *Development Economics*, Oxford university press, 2009.
7. Partha Das Gupta, *Economics A very short introduction*, OUP, 2007.
8. Kaushik Basu, *The new oxford companion to Economics in India*, OUP, 2012.
9. M.A Oommen(ed), *Kerala's development experience Volume I&II*, Institute of social sciences.
10. B A Prakash(ed), *Kerala economy problems and prospects*, sage publications, New Delhi.
11. Utsa Patnaik, *Poverty Trends in India 2004-05 to 2009-10, Updating Poverty Estimates and Comparing Official Figures*, Economic and Political Weekly, vol-XLVIII No.40, October 05, 2013.
12. Utsa Patnaik, *Trends in urban poverty under economic reforms: 1993-94 to 2004-05*, Economic and Political Weekly, vol-XLV No.4, January 23, 2010.
13. Kaushik Gangopadhyay and Kamal singh, *Extent of poverty in India A different Dimension*, Economic and Political Weekly, vol-XLVIII No.06, February 09, 2013
14. Radhicka Kapoor, *Inequality matters*, Economic and Political Weekly, vol-XLVIII No.02, January 12, 2013
15. Himanshu, *Towards new poverty lines for India*, Economic and Political Weekly, vol-XLV, No.01, January 02, 2010
16. Partha Das Gupta, *Nature of economic development and economic development of nature*, Economic and Political Weekly, vol-XLVIII No.51, December 21, 2013
17. Prachi Mishra, *Has India's growth story withered?*, Economic and Political Weekly, vol-XLVIII No.15, April 13, 2013
18. Pulapre Balakrishnan, *Economic Growth in India: History and prospect*, Oxford University press, 2010.
19. Prabahath Patnaik, *Economic growth and employment*, Economic and political weekly, Vol: XLV1, No: 26-27, June 25, 2011.
20. Amitava Bose, *The analytics of changing growth rates*, Economic and political weekly, Vol: XLV, No: 28, July 10, 2010.
21. Jean Dreze and Reetika Khera, *The BPL census and Possible alternative*, Vol: XLV, No: 9, February 27, 2010.
22. Krishna Bharadwaj, *Accumulation Exchange and Development: Essays on the Indian Economy*, Sage Publications, New Delhi
23. Michael P Todaro and Stephen C Smith, *Economic Development* (8<sup>th</sup> ed), Pearson Education Ltd, 2009.

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|------------------------|--------------------------------------------------|
| <b>Course Title</b>    | <b>: ECONOMICS OF DEVELOPMENT AND PLANNING I</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                             |
| <b>Credit</b>          | <b>: 4 (72 contact hours)</b>                    |
| <b>Course Code</b>     | <b>: 5 B10 DEV ECO</b>                           |
| <b>Semester</b>        | <b>: V</b>                                       |

### Course Objectives

The main purpose of this paper is to offer a survey of mainstream theories of growth and development to enable students to acquire an understanding of multi-dimensional aspects of development issues.

### SYLLABUS

**Module I: Introduction to Development Economics** Defining development; Development and Growth; Structure and characteristics of developing nations- Explaining Under development-obstacles to growth and development – economic and non-economic factors- Vicious circle of poverty– Basic requirements of development –Measuring Development and Development Gap; Human Development Index and other indices of development and quality of life. Recent Human Development trends in India and Kerala. (15 hours)

**Module II: Theories of Growth and Development** Adam Smith, Ricardo, Malthus, Marx’s Theory of Economic Development –Schumpeter’s theory, Rostow’s Stages theory, Big push theory, Critical minimum effort thesis ,Balanced and Unbalanced theories- Lewis Growth model - contributions of Nurkse, Vakil and Brahmaanda in using Disguised unemployment as saving potential. Growth models: Harrod Domar and Solow -Swan. (25 hours)

**Module III: Determinants of Development** Capital and Economic Development; Capital formation; sources of capital- capital –output ratio- Population and Economic development; Theory of Demographic Transition- Human capital formation and development– Technological change and Economic Development; Intermediate technology.(15 hours)

**Module IV: Policies for Development** Role of Industrial and Agricultural policies in Development – Foreign Trade policy –Inward looking and outward looking policies – Foreign capital and foreign aid in development (17 hours)

### References Books

1. Meir,Gerald ,M , Leading issues in Economic Development –Oxford University Press, Delhi (1990).
2. Thirwal,A.P., Growth and Development-ELBS/Macmillan, London (1994)
3. Todaro, Michael ,P; Economic Development in the Third World ,Orient Longman,Hyderabad,(1993).
4. Adelman Irma : Theories of Economic Growth and Development , Stanford University Press,Clifornia (1962).

5. Nurkse ,Ragner ; Problems of Capital formation in Under Developed Countries, Monthly Review Press,Newyork (1957)
6. A.N.Agarwal and Kundan Lal ; Economics of Development and Planning. Vikas Publishing House Pvt.Ltd, New Delhi
7. Misra and Puri ; Economics of Development and Planning –Theory and Practic,Himalaya Publishing House ,New Delhi( 2007)
8. R.C Agarwal ; Economics of Development and Planning –Theory and Practice, Lakshmi Narain Agarwal Educational Publishers ,Agra (2004)
9. UNDP Reports

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|------------------------|-------------------------------------------|
| <b>Course Title</b>    | <b>: ECONOMICS OF BANKING AND FINANCE</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                      |
| <b>Credit</b>          | <b>: 4 (90 contact hours)</b>             |
| <b>Course Code</b>     | <b>: 5 B11 ECO</b>                        |
| <b>Semester</b>        | <b>: V</b>                                |

### Course Objectives

Banking and financial institutions is an integral part of the economic system of a country. The nature, functioning and issues related to financial institutions need to be understood by students of economics. The operation and regulation of financial institutions are to be studied to appreciate their key role in an economy, especially after the far-reaching banking and financial sector reforms in India and elsewhere. The present course is designed to acquaint the students fully with the fundamentals of financial system.

### SYLLABUS

**Module I** Financial system: meaning, functions, structure of Indian financial system. Importance of financial system in the development of Indian economy. (10 hours)

**Module II** Banking and Non Banking Financial Institutions: Commercial Banks- Functions, liabilities and assets of banks, Mechanism of credit creation, Prerequisites of a sound commercial banking system, Role of commercial banks before and after nationalization in economic development in India. Rural Banks and Development banks- NABARD-IFCI -IDBI-ICICI-SIDBI-SFC. Non Banking Financial Institutions- Definition and types of NBFI. Banking sector Reforms. Innovations in banking-ATM, E-banking-Credit cards, debit cards and Smart cards-Internet banking, Mobile banking and Core banking. (35 hours)

**Module III** Financial Markets and Instruments: Money Market, nature and functions, Features of Indian money market, Components of money market and their instruments( call money market, Treasury bill market, commercial bill market, Certificate of deposit, commercial paper)

Capital Market: Features, functions, Structure of Indian capital market – Primary market and secondary market, stock exchanges (BSE,NSE, OTCEI). Derivative market- financial derivative – types (forwards, futures, options, swap). Internet trading, Stock market index. Financial sector Reforms (30 hours)

**Module IV** Regulatory Authorities: Central Bank- Functions and objectives, Instruments of credit control-Quantitative and qualitative, Role of RBI in financial market. SEBI – Functions, role and

working of SEBI. Measures taken by RBI and SEBI to regulate the financial system of India (15 hours).

### **Reference Books**

1. Khanna Perminder (2005) Advanced Study in Money and Banking. Theory and Policy Relevance in the Indian Economy. Vol.1. Atlantic Publishers and Distributors.
2. Raj Kapila, Uma Kapila(2003)ed. India's Banking and Financial Sector in the New Millennium, Volume 2. Academic foundation, N.Delhi.
3. Muraleedharan, D(2009) Modern Banking: Theory And Practice. PHI Learning Pvt. Ltd.
4. Sharma, K.C (2007) Modern Banking in India. Deep & Deep Pub. Pvt Ltd.
5. Machiraju, H. R.(2008) Modern Commercial Banking.
6. Bharati V. Pathak,(2011) The Indian Financial System: Markets, Institutions and Services. Pub. Dorling Kindersley (India) pvt.Ltd.
7. Bhole, L.M.(2009)Financial Institutions & Markets. Tata McGraw Hill co.
8. Clifford Gomez.(2008) Financial markets, institutions, and financial services. Prentice- Hall of India Pvt. Ltd.
9. Gurusamy(2009) Indian Financial System. Tata McGraw Hill.
10. Lester.V.Chandler – Money & Banking
11. R.S.Sayers - Modern Banking
12. S.K.Basu – Banking theory & practice
13. Maheswari & Varshni – Banking theory & practice
14. Suraj.B.Guptha – Monetary Economics
15. Decock – Central banking
16. Pathak.V.V - The Indian Financial System-Pearsons education
17. Smith.P.J - Economics of Financial institutions and Markets-Irwin Homewood
18. M.K. Guptha, Monika Chopra - Financial market Institutions and Services –Anes India
19. H.R. Machiraja - Indian financial system -Vikas publications
20. Gordan, Natarajan - Financial markets and services – Himalaya Publishing house
21. Banking and Financial systems- V.Nityananda Sarma, foundation books (Cambridge University Press India PVT Ltd, 2011



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|------------------------|-------------------------------------------------|
| <b>Course Title</b>    | <b>: BASIC TOOLS FOR ECONOMIC ANALYSIS – II</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                            |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>                  |
| <b>Course Code</b>     | <b>: 6 B12 ECO</b>                              |
| <b>Semester</b>        | <b>: VI</b>                                     |

### **Course Objectives**

This course is expected to provide students with an elementary introduction to statistical tools and mathematical concepts that are used in the study of Economics in UG level. This course will cover essential elementary topics in Statistics and mathematics. The basic aim of the course is to develop skills in applying in statistical techniques and mathematical concepts that are indispensable for the in-depth study of theoretical as well as empirical economics.

### **SYLLABUS**

#### **Module I: Matrices**

Concepts, Types, Operation, addition, subtraction, multiplication, determinants, inverse (for 2x2 matrices only). Solution of simultaneous equations in 3 unknowns using Cramer's rule, solution of simultaneous equations in 2 unknowns using matrix inversion method, solving market equilibrium. (25 hours)

#### **Module II: Differential calculus**

Limit and continuity (definition only), differentiation of single variable function: rules, second order derivatives, sign and magnitude of derivatives and its interpretation – concept of slope, maxima and minima of unbounded functions. Differentiation of two variable functions: partial derivatives of first and second order, Application in utility function, production and cost function, Cobb-Douglas production function. (25 hours)

#### **Module III: Bivariate Data Analysis**

Simple correlation – meaning and types and measurement – scatter diagram, Pearson's coefficient and rank correlation coefficient, interpretation. Simple linear regression – meaning, OLS method of estimation. Relationship between correlation and regression coefficients. Examples from economics: Estimation of consumption function, saving function and production function and interpretation of results. (30 hours)

#### **Module IV: Time series analysis and Index numbers**

Components of time series, measurement of trend – semi average, moving average, method of least squares. Types of index numbers – weighted and unweighted, price and quantity indices, Laspyer's, Paasche's and Fisher's index numbers. Time reversal and factor reversal tests, construction of consumer price and wholesale price indices, base shifting and splicing, uses of index numbers. (28 hours)

#### **Reference Books**

1. Allen R.G.D. (1956): Mathematical Analysis for Economists, McMillan
2. David Bowers (1991): Statistics for Economics and Business, McMillan
3. Gupta S.P.(2008): Statistical Methods, Sultan Chand, New Delhi
4. Monga G.S. (2000): Mathematics and Statistics for Economics, Vikas Publishing House, New Delhi
5. Srinath Baruah (2001): Basic Mathematics and its applications in Economics, McMillan

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|------------------------|-------------------------------------------|
| <b>Course Title</b>    | <b>: CENTRAL THEMES IN INDIAN ECONOMY</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                      |
| <b>Credit</b>          | <b>: 4 (90 contact hours)</b>             |
| <b>Course Code</b>     | <b>: 6 B13 ECO</b>                        |
| <b>Semester</b>        | <b>: VI</b>                               |

## **SYLLABUS**

### **Module I India in the world economy**

Characteristics of Indian economy- Indian economy in a global scenario-(problems and prospects of Indian economy in a global context)- evolution of Indian economic planning- objectives of economic planning in India- Achievements of planning in India -A critical evaluation of the planning process- Current Five Year plan: An appraisal (15hours)

### **Module II Role of agriculture and industry**

Role of agriculture sector :( its contribution to GDP- contribution to international trade, employment creation etc)-problems of Indian agriculture-Recent initiative to improve agriculture sector- Agriculture sector in the post liberalization period.

Overview of industrial development in India- role of small scale industries in Indian economy- industrial development and policies in the post liberalization period (25hours)

### **Module III Service sector and foreign trade**

Role of service sector in the economic development of India- post liberalization scenario (impact of liberalisation policies on health and education sector in India).

India's foreign trade- sectoral composition-pattern of imports and exports- economic reforms since 1991 or new economic Policy (NEP) and its impact on foreign trade (20 hours)

### **Module IV Kerala Economy**

Kerala economy- unique features (demographic transition, development of education and health sector)

Agriculture sector- land reforms –agricultural stagnation

Industrial sector-its structure and growth-industrial backwardness

Key issues related to development: Migration, foreign remittances, energy crisis-food security-ageing and lifestyle diseases- empowerment of women (30 hours)

## Reference Books

1. C Ranagarajan and R Kannan, *Selected essays on Indian economy Volume 1&11*, Academic Foundation, 2004
2. Uma Kappila, *Indian economy since independence*, Academic foundation, 2009
3. Datt Ruddar, K. P. M. Sundharam, *Indian economy*, S. Chand, 1990
4. Jean Drèze, Amartya Sen, *India: Development and Participation*, Oxford University Press, 2002
5. Isher Judge Ahluwalia, I.M.D. Little, *India's Economic Reforms and Development: Essays for Manmohan Singh*, OUP India, 2012
6. Kaushik Basu, *Analytical Development Economics: The Less Developed Economy Revisited*, MIT Press, 1997.
7. Kaushik Basu, *India's Emerging Economy: Performance and Prospects in the 1990s and Beyond*, MIT Press, 2004.
8. Pulin Nayak et.al, *India's Economy and Growth: Essays in Honour of V K R V Rao*, SAGE Publications Ltd, 2010
9. B. A. Prakash, *The Indian Economy Since 1991: Economic Reforms and Performance*, Pearson Education India, 2012
10. Neera Chandhoke, Praveen Priyadarshi, *Contemporary India: Economy, Society, Politics*, Pearson Education India, 2009
11. Bimal Jalan , *Emerging India: Economics, Politics and Reforms*, Penguin UK, 2013
12. Bimal Jalan, *India's Economic Policy*, Penguin Books India, 1997
13. Sumit K Majumdar, *India's Late, Late Industrial Revolution: Democratizing Entrepreneurship*, Cambridge University Press, New Delhi, 2012
14. Santosh Mehrotra et.al, *Turnaround in India's employment story silver lining amidst joblessness and informalisation ?*, Economic and political weekly, Vol XLV111, No:35, august 31, 2013
15. Sudip Chaudhury, *Manufacturing trade deficit and Industrial policy in india*, Economic and political weekly, Vol XLV111, No:8, February 23, 2013
16. Sudha narayanan, *The national food security Act vis-a-vis the WTO agreement on agriculture*, Economic and political weekly, Vol XLIX, No: 5, February 01, 2014.
17. R Nagaraj, *India's dream Run, 2003-08 Understanding the boom and its aftermath*, Economic and political weekly, Vol - XLVIII No. 20, May 18, 2013
18. K Sundaram, *Employment, wages and poverty in the non –agricultural sector: India 2000-05*, Economic and political weekly, Vol-XL111No: 22, May 31, 2008.
19. Ajay Mahal and Indira Rajaraman, *Decentralisation, preference diversity and public spending: health and education in India*, Economic and political weekly, Vol.XLV No: 43, October 23, 2010
20. Jandhyala B G Tilak, *Higher education policy in India in transition*, Economic and political weekly, Vol: XLV11, No: 13, March 31, 2012

21. A K Shiva kumar, *Inequities in Access to Health Services in India: Caste, Class and Region*, Economic and political weekly, Vol: XLV , No: 38, September 18, 2010
22. Saumen Chattopadhyay, *The Market in Higher Education: Concern for Equity and Quality*, Economic and political weekly, Vol: XLIV , No: 29, July 18, 2000
23. Jean-Frederic Levesque and Subrata Mukherjee, *Changing Inequalities in Utilisation of Inpatient Care in Rural India: Evidence from the NSS*, Economic and political weekly, Vol - XLV No. 46, November 13, 2010
24. K K George and N Ajith Kumar, *Kerala's Education System: From Inclusion to Exclusion?*, Economic and political weekly, Vol - XLIV No. 41-42, October 10, 2009.
25. P D Jeromi, *What Ails Kerala's Economy: A Sectoral Exploration*, Economic and political weekly, Vol - XXXVIII No. 16, April 19, 2003
26. Jeffery Robin, 1992, *Politics, women and wellbeing, How Kerala became a model*, Oxford university press, Delhi
27. George k k, 1999, *Limits to Kerala model of development: an analysis of fiscal crisis and its implications*, centre for development studies Trivandrum
28. Joseph Tharamangalam, (ed) 2006, *Kerala the paradoxes of public action and development*, orient Longma.

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|------------------------|----------------------------------------------------|
| <b>Course Title</b>    | <b>: ECONOMICS OF DEVELOPMENT AND PLANNING –II</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                               |
| <b>Credit</b>          | <b>: 4 (90 contact hours)</b>                      |
| <b>Course Code</b>     | <b>: 6 B13 DEV ECO</b>                             |
| <b>Semester</b>        | <b>: VI</b>                                        |

## SYLLABUS

**Module: 1: Introduction to Development Planning:** Development planning : meaning and rationale of economic planning –Under developed countries and Planning, Types of planning-Long term, medium term and short term plans –regional, national and international planning ; indicative and imperative planning,centralized and decentralized planning .Totalitarian and Democratic planning , Physical and Financial planning, Rolling and fixed planning. (15 hours)

**Module: II: Techniques in Planning:** Economic Controls in a planned economy-meaning, need, and types, Conditions of success: Planning strategy,- Investment criteria – capital –Output ratio, Social Marginal Productivity, Marginal Per capita Reinvestment Quotient,, Dobb-Sen criterion, Marginal Growth contribution criterion : Choice of techniques- Project evaluation and Cost –Benefit analysis –Input–Output analysis- Linear Programming-Role of shadow prices in planning.(30 hours)

**Module: III: Economic Planning in India and Kerala:** Planning in a mixed economy- Objectives and strategy of planning- Plan Models- Mahalanobis model- resource mobilization, achievements and limitations of economic planning in India– Policies for eradication of poverty, unemployment and economic inequalities – Objectives and strategies of 12<sup>th</sup> five year plan (2012-2017). The experience of People’s Planning in Kerala – Limits to Kerala model of development. (30 hours)

**Module IV: International Measures for Sustainable Development:** UNDP and Millenium Development goals – Problems and Policies of Sustainable Development. Report of the Club of Rome, Brudtland Commission Report : The Earth Summit at Rio De Genero and Recent Developments. (15 hours)

### References Books

1. A.N.Agarwal and Kundan Lal ; Economics of Development and Planning. Vikas Publishing House Pvt.Ltd, New Delhi

2. Misra and Puri ; Economics of Development and Planning –Theory and Practice, Himalaya Publishing House ,New Delhi( 2007)
3. R.C Agarwal ; Economics of Development and Planning –Theory and Practice, Lakshmi Narain Agarwal Educational Publishers, Agra (2004)
4. M.A Oommen ; Essays on Kerala Economy ,Oxford 7IBH Publishing co.Pvt.Ltd. New Delhi, (1993).
5. M.A. Oommen ; Rethinking Development –Kerala’s Development Experience ,Vol I&II , Institute of Social Sciences, Concept Publishing Company, New Delhi(1999)
6. K.K.George ; Limits to Kerala Model of Development , Centre for Development Studies, Thiruvananthapuram (1988)
7. Donella H Meadows,et al ,The Limits to Growth ,A Report for the Club of Rome’s Project on the Predicament of Mankind ; Universe Books Newyork, (1972)
8. SteveHackett,Envioronment and Natural Resource Economics, Theory Policy and Sustainable Society; M.E Sharpe,New york(1998)
9. Ketar Singh and Viswa Bellah ,Co-operative Management of Natural Resources ,Sage Publishers, New Delhi(1996)
10. Meir,Gerald ,M , Leading issues in Economic Development –Oxford University Press, Delhi (1990).
11. Thirwal,A.P., Growth and Development-ELBS/Macmillan, London (1994)
12. Todaro, Michael ,P; Economic Development in the Third World ,Orient Longman, Hyderabad, (1993).
13. Ashok Rudra, India Plan Models, Allied Publishers, New Delhi.
14. Planning Commission’s Documents.

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|------------------------|--------------------------------|
| <b>Course Title</b>    | <b>: PUBLIC ECONOMICS</b>      |
| <b>Course Category</b> | <b>: CORE COURSE</b>           |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b> |
| <b>Course Code</b>     | <b>: 6 B14 ECO</b>             |
| <b>Semester</b>        | <b>: VI</b>                    |

### **Course Objectives**

Public economics is a wider concept compared to public finance and it incorporates theories of state and rationale of public finance as well. This paper covers theories of public economics and discusses about Indian public finance. It looks at how public sector behaviour is shaped and discusses about public choice. This will also deal with the nature of government intervention and its implications for allocation, distribution and stabilization. The objective of the course is to provide an understanding of the basic issues relating to public revenue, expenditure, debt management, budget preparation and centre state financial relations in India. This learning will make them capable of understanding the financial activities and policies of the government.

### **SYLLABUS**

#### **Module I Introduction**

Meaning and scope of public economics- fiscal functions: An Overview (Allocation, distribution, stabilization and growth) - public goods: definition, pure and impure public Goods (social goods, merit goods, mixed goods) - free riding-externalities: the problem and its solutions - Theory of public Choice and its critique. (13 hours).

#### **Module II Public Revenue**

Meaning of public revenue - sources of public revenue- Trends in public revenue in India.

- (a) Tax Revenue – Meaning of tax-canons of taxation- theories of taxation( financial theory, benefit theory, cost of service theory, ability to pay theory)- concepts of impact, incidence( different concepts of incidence , Musgrave’s theory of incidence) and shifting(forward and backward shifting, demand and supply theory of shifting of taxation) of taxation- classification of taxes based on the impact and incidence( direct and indirect taxes; its merits and demerits),based on tax rate and tax base (Progressive, Proportional, Regressive, Digressive taxes),based on the nature of commodity(specific and Ad Valorem taxes)- VAT: its merits and demerits.
- (b) Non tax revenue sources
- (c) Public debt: Meaning and Classification- Methods of Repayment of Public Debt-trends in public debt of India. (Kerala can be given for assignments/seminar ) (40 hours).

#### **Module III Public expenditure**

Meaning of public expenditure- Canons of public expenditure-Theories of public expenditure-Theory of maximum social advantage- Wagner’s law-Wiseman-Peacock hypotheses- trends in public expenditure in India (trends in Kerala can be given as assignment or seminar).(20 hours).



## **Module IV Budget**

Budget- Meaning of deficit and surplus budget- Meaning of deficit financing and methods of deficit financing- Classification of budget (Performance, Programme and Zero Base Budgeting)-Preparation and Presentation of Budget in India-analysis of previous central and state budget (15 hours).

## **Module V Fiscal federalism**

Meaning of fiscal federalism-principles of federal finance- functions of finance commission- analysis of latest finance commission in India-evaluate the performance Kerala state finance commission (20 hours).

## **Reference Books**

1. Gareth D Myles, *Public economics*, Cambridge University press, 1995.
2. John Leach, *A course in public economics*, Cambridge University press 2004
3. Cullis and Jones, *Public finance and public choice* (2<sup>nd</sup> ed), OUP,
4. Musgrave R and Musgrave P B, *Public finance in theory and practice*, Mc graw hill Ltd
5. J R Gupta, *Public economics in India theory and practice*, Atlantic publishers, New Delhi, 2007.
6. Anthony Barnes Atkinson, Joseph E. Stiglitz, *Lectures on Public Economics*, McGraw-Hill Book Company, 1980.
7. K K Andley, K. P. M. Sundharam, *Public Finance and Public Economics: With Special Reference to Underdeveloped Countries*, Ratan Prakashan Mandir, 1966
8. Louis Kaplow, *The Theory of Taxation and Public Economics*, Princeton University Press, 2011
9. Attiat F Ott and Richard J Cebula,(ed)*The Elgar Companion to Public economics empirical public economics*,2006, Elgar publishing company ltd.
10. Hugh Dalton, *Principles of Public Finance*, Routledge, 2013
11. Gulati, I.S and George, K.K: *Essays in federal financial relations*, Centre for Development Studies Monograph Series, Oxford & IBH Pub. Co., 1988
12. Raja j chelliah, *Fiscal Policy for underdeveloped countries with special reference to India*, Routledge, 2012.
13. Musgrave, *Public Finance in theory and practice*, Tata McGraw-Hill Education, 2004.
14. Sudipto Mundle, *Policies, Paradigms and Development debate at the close of 20<sup>th</sup> century*, Economic and Political Weekly, Vol-XXVIII No: 36, April 03, 1993
15. Amaresh Bagchi, *Rethinking Federalism: Changing Power Relations Between the Center and the States*, National Institute of Public Finance and Policy, The Journal of Federalism 33:4 (Fall 2003)
16. Joseph E Stiglitz, *Market, Market failures and Development*, The American Economic Review, Vol.no.79, No.2.
17. Pinaki Chakraborty, , *“Deficit Fundamentalism vs Fiscal Federalism: Implications of 13th Finance Commission’s Recommendations,”* Economic & Political Weekly, Vol. XLV, No. 48, pg. 56-63, (November) 2010

|                        |                                     |
|------------------------|-------------------------------------|
| <b>Course Title</b>    | <b>: BASIC ECONOMETRIC ANALYSIS</b> |
| <b>Course Category</b> | <b>: CORE COURSE</b>                |
| <b>Credit</b>          | <b>: 4 (90 contact hours)</b>       |
| <b>Course Code</b>     | <b>: 6 B15 ECO</b>                  |
| <b>Semester</b>        | <b>: VI</b>                         |

### **Course Objectives**

The most striking developments in recent decades in Economics have been the increased emphasis on the development and use of econometric techniques for the analysis of economic problems. The study of Econometrics has become an essential part of every undergraduate course in Economics, and it is not an exaggeration to say that it is also an essential part of every economist's training. Mastery over econometric tools helps the practitioner understand the problem at hand in its different dimensions. Econometric methods have proved particularly useful for understanding the inter-relationships among econometric variables. Hence, training in econometrics at UG level will enhance the analytical skill of students thereby they will attract wider demand in professional fields.

### **SYLLABUS**

#### **Module I Introduction to Econometrics**

Definition and Scope of Econometrics – Why study Econometrics? – Relationship between Economic theory, Mathematics and Statistics – Division of Econometrics – Nature and sources of data for Econometric analysis – Methodology of Econometric Research – Desirable properties of an Econometric model – Limitations of Econometrics. (15 hours)

#### **Module II Two variable regression analysis**

Stochastic and non-stochastic relations - The concept of Population regression function and its stochastic specifications –the meaning of the term Linear - The Sample regression function - Ordinary least squares (OLS) method - Assumptions - properties of OLS estimators: Gauss-Markov Theorem - statistical testing of regression coefficient: coefficient of determination ( $r^2$ ) - standard error test - the exact level of significance: p-value - regression analysis and ANOVA - F test of significance.(25 hours)

#### **Module III Multiple regression analysis**

Multiple linear regression model – assumptions – OLS estimation – variance and standard error - Hypothesis testing – goodness of fit – Estimating three variable production function: Cobb-Douglas production function (20 hours)

#### **Module IV Problems in OLS estimation: Violation of Classical assumptions of regression model**

Violation of Classical assumptions of regression model: Meaning, Causes, Consequence

Detection and remedial measures of Multicollinearity – Heteroscedasticity –Autocorrelation (30 hours)

### **Reference Books**

1. Dilip M. Nachane (2006) *Econometrics*, Oxford University Press, New Delhi.
2. Dimitrios Asteriou and Stephen G Hall (2011), *Applied Econometrics*, Second edition, Palgrave Macmillan, New York.
3. Greene, W. (1997), *Econometric Analysis*, Prentice Hall, New York.
4. Gujarati, Damodar (2004), *Basic Econometrics*, 4<sup>th</sup> edition, McGraw Hill, New York.
5. Gujarati, Damodar (2006), *Essentials of Econometrics*, 3<sup>rd</sup> edition, McGraw Hill, New Delhi.
6. Gujarati, Damodar (2011): *Econometrics by Example*, Palgrave Macmillan, New York.
7. Koutsoyiannis A (1977), *Theory of Econometrics*, Palgrave, New York
8. Maddala G S (2002), *Introduction to Econometrics*, 3rd edition, John Wiley & Sons, New York
9. Pindyck R.S and D.L. Rubinfeld (1990), *Econometric models and economic forecasts*, 4<sup>th</sup> edition, Mc-Graw hill New York.
10. Ramanathan, Ramu (2002), *Introductory Econometrics with Applications*, Thomson Learning Inc, Singapore.
11. Upender M (2003), *Applied Econometrics*, Vrinda publication private limited, New Delhi.
12. Wooldridge .M. Jeffrey (2009), *Econometrics*, Cengage learning India private limited New Delhi.

### **Supplementary Readings**

1. Greene, W. (1997), *Econometric Analysis*, Prentice Hall, New York.
2. Griffith, W.F., R.H. Hill and G.G. Judge (1993), *Learning and Practicing Econometrics*, John Wiley, New York.
3. Johnston J. and J. D. Nardo (1997), *Econometric Methods*, McGraw Hill, New York.
4. Kmenta, J. (1997), *Elements of Econometrics*, Michigan Press, New York.
5. Michael D. Intriligator (1980), *Econometric Models, Techniques and Applications*, Prentice Hall of India, New Delhi.

|                        |                               |
|------------------------|-------------------------------|
| <b>Course Title</b>    | <b>: PROJECT</b>              |
| <b>Course Category</b> | <b>: CORE COURSE</b>          |
| <b>Credit</b>          | <b>: 2 (54 contact hours)</b> |
| <b>Course Code</b>     | <b>: 6 B16 ECO(Pr)</b>        |
| <b>Semester</b>        | <b>: VI</b>                   |

### **Course Objectives**

Generating new knowledge and updating existing knowledge from day to day experience is one of the aims of higher education. For this purpose a student is to be encouraged to search and research for new knowledge. A Student should be able to apply the theoretical knowledge that they have acquired in the class room environment to the real world situations by taking up any issue as a project that requires review, explanation or solution. The theme of the project need not be restricted to any particular course. Instead, the topic may be selected from any of the courses that the student is exposed to in various semesters.

This course is designed to enable the student to approach socio-economic issues in a theoretical perspective. The student is encouraged to collect and organize the existing information on the selected topic and arrive at his/her own logical conclusion by following a methodology and applying the analytical tool.

### **Instructions**

1. The project report should be in English.
2. All project reports will have a common structure. The general format to be followed is given below.
3. The three hours allotted for the project work shall be utilized for:
  - a) Equipping the students with methodology of project preparation,
  - b) Familiarizing the basic nature and structure of a project,
  - c) Preparing questionnaire,
  - d) Collecting data,
  - e) Analyzing data using Excel/SPSS software
4. Project work should ideally be prepared by a group consisting of not more than FIVE students. But in special circumstances (only with the consent of the concerned department) individual students

should also be permitted to submit the project work. If there are more than five students in a group, the project will not be accepted by the university.

5. The project report/work shall be evaluated by external examiner(s) as in the case of other papers. It should be brought under centralized valuation.

6. The evaluation of the project shall be on the basis of

- Conformity of the Project with the format suggested in the syllabus
- Methodology adopted
- Analytical aptitude of the student
- Overall performance of the work
- Findings of the report
- Contemporary relevance of the topic selected and
- VIVA VOCE conducted in respective colleges.

## **FORMAT FOR PREPARATION OF PROJECT REPORT**

### **1. Arrangement of contents:**

The sequence in which the project report material should be arranged and bound should be as follows:

1. Cover Page & Title Page
2. Abstract
3. Table of Contents
4. List of Tables
5. List of Figures
6. List of Symbols, Abbreviations and Nomenclature
7. Chapters
8. Appendices
9. References

The table and figures shall be introduced in the appropriate places.

### **2. Page dimension and typing**

The project report should be printed in A4 size bond paper and bound using flexible cover of the thick white art paper or spiral binding. The cover should be printed in black letters and the text for printing should be identical. The impression on the typed copies should be black in colour. The

general text of the report should be typed with 1.5 line spacing. The general text shall be typed in the Font style 'Times New Roman' and Font size 12. Paragraphs should be arranged in justified alignment with margins 1.25" each on top, bottom, left and right of the page with portrait orientation. The content of the report should vary between 25 and 30 pages.

### **3. Preparation format**

**3.1 Abstract** – Abstract should be one page synopsis of the project report typed with double line spacing, Font Style Times New Roman and Font Size 12.

**3.2 Table of Contents** – The title page (numbered with lower case Roman letter) will not find a place among the items listed in the Table of Contents. A specimen copy of the Table of Contents of the project report is given in **Appendix I**.

**3.3 List of Tables** – The list should use exactly the same captions as they appear above the tables in the text.

**3.6 List of Figures** – The list should use exactly the same captions as they appear below the figures in the text.

**3.7 List of Symbols, Abbreviations and Nomenclature** – Standard symbols, abbreviations etc. should be used.

**3.8 Chapters** – The chapters may be broadly divided into 3 parts (i) Introductory chapter, (ii) Chapters developing the main theme of the project work (iii) and Conclusion. Depending on the nature of the project selected by the student the introductory chapter should invariably contain the background of study, the problem, objectives, limitations, methodology and review of earlier studies. The main text will be divided into several chapters and each chapter may be further divided into several sub-divisions.

Each chapter should be given an appropriate title.

Tables and figures in a chapter should be placed in the immediate neighbourhood of the reference where they are cited. Endnotes may be given at the end of each chapter. They should be typed single space, with font size of 11 points.

**3.9 Appendices** – Appendices are provided to give supplementary information, which if included in the main text may serve as a distraction and may cloud the central theme.

- Appendices should be numbered using Arabic numerals, e.g. Appendix 1, Appendix 2, etc.
- Appendices, Tables and References appearing in appendices should be numbered and referred to at appropriate places just as in the case of chapters.

- Appendices shall carry the title of the work reported and the same title shall be made in the contents page also.

**3.10 List of References** –The listing of references should be typed 4 spaces below the heading “REFERENCES” in alphabetical order in single spacing with left alignment. The reference material should be listed in the alphabetical order of the first author. The name of the author/authors should be immediately followed by the year and other details. A typical illustrative list given below relates to the citation example quoted above.

**References Books**

A material in the text may be cited as in reference 1 and an article in a journal may be cited as in reference 2.

1. Watson D. S. and Getz. M (1986): “Price Theory and its Uses”, Khosla Publishing House. Chapters 1, 2 and 3
2. Brown and Deaton (1972): “Models of Consumer Behaviour: A Survey”, Economic Journal, pp 1145-1236.

1. **Table and figures** - The word Table, means tabulated numerical data in the body of the project report as well as in the appendices. All other nonverbal materials used in the body of the project work and appendices such as charts, graphs, maps, photographs and diagrams may be designated as figures. No border line should be given to the pages.

**APPENDIX I**

**(A typical specimen of table of contents)**

<Font Style Times New Roman>

*TABLE OF CONTENTS*

**CHAPTER NO. TITLE PAGE NO.**

*ABSTRACT iii*

**LIST OF TABLE xvi**

*LIST OF FIGURES xviii*

**LIST OF SYMBOLS xxvii**

**1. INTRODUCTION 1**

1.1 GENERAL 1

1.2 ..... 2

|                             |           |
|-----------------------------|-----------|
| 1.2.1 General               | 5         |
| 1.2.2                       | 12        |
| 1.2.2.1 General             | 15        |
| 1.2.2.2                     | 18        |
| 1.2.2.3                     | 20        |
| 1.2.3                       | 25        |
| 1.3                         | 28        |
| 1.4                         | 30        |
| <b>2. LITERATURE REVIEW</b> | <b>32</b> |
| 2.1 GENERAL                 | 35        |
| 2.2                         | 38        |
| 2.3 2.2                     |           |



# ***COMPLEMENTARY COURSES***

|                        |                                              |
|------------------------|----------------------------------------------|
| <b>Course Title</b>    | <b>: MATHEMATICS FOR ECONOMIC ANALYSIS-1</b> |
| <b>Course Category</b> | <b>: COMPLEMENTARY</b>                       |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>               |
| <b>Course Code</b>     | <b>: 1C01 ECO</b>                            |
| <b>Semester</b>        | <b>: I</b>                                   |

### **Course Objectives**

Students of economics should learn the basics of mathematical tools and to apply them for better understanding of economic theory. Since most of the economic doctrines are based on mathematics, it is essential for the students to acquire with tools which help them enhance further knowledge in economics.

This course is expected to provide students with an elementary introduction to mathematical concepts that are used in the study of economics at UG level. The basic aim of the course is to develop skills in applying mathematical concepts that are indispensable for the in depth study of theoretical as well as empirical economics.

### **SYLLABUS**

#### **Module I Functions and Graphs in Economics**

Concept of Function - Classes and types of Functions, Single valued, multi-valued, single variable, multi-variable, increasing, decreasing, convex and concave functions. Graph of functions, linear, quadratic and cubic, logarithmic, exponential functions and their graphs. (30 hours)

Allen (1956) Chapter 3, Chiang. A.C (1988) Chapter 2

#### **Module II Differentiation of Single Variable functions**

Limit and Continuity of Functions - Some important limits - Point continuity and interval continuity - Properties of continuous functions - Rules of differentiation - Higher Order derivatives - L'Hospitals' rule - Application of Derivatives - Unconstrained Maxima and Minima of functions (38 hours)

Allen (1956) Chapters 4 to 10. Yamane (2004) Chapter 2 and 3. Chiang. A.C (1988) Chapter 6, 7, 9 and 10.

### **Module III Differentiation of Several Variable functions**

Derivatives and Differentials - Partial and total derivatives, Total differential - Higher order derivatives and differentials - Homogeneous function - properties - Constrained optimisation - Lagrange multiplier method. (40 hours)

Allen (1956) Chapters 11 to 14. Yamane (2004) Chapters 4 and 5. Chiang. A.C (1988) Chapters 11 and 12.

1. No essay questions should be asked from module I.
2. Weightage to the modules should be given according to the hours allotted for each.

### **Reference books**

1. Allen. R.G.D (1956): "Mathematical Analysis for economists" Macmillan
2. Yamane, Taro (2004): "Mathematics for economists: an elementary survey", Prentice Hall of India.
3. Chiang. A.C (1988): "Fundamental Methods of Mathematical Economics", 3 ed. McGraw Hil

|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Course Title</b>    | <b>: MATHEMATICS FOR ECONOMIC ANALYSIS-11</b> |
| <b>Course Category</b> | <b>: COMPLEMENTARY</b>                        |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>                |
| <b>Course Code</b>     | <b>: 2C02 ECO</b>                             |
| <b>Semester</b>        | <b>: II</b>                                   |

### **Course Objectives**

Students of economics should learn the basics of mathematical tools and to apply them for better understanding of economic theory. Since most of the economic doctrines are based on mathematics, it is essential for the students to acquire with tools which help them enhance further knowledge in economics.

This course is expected to provide an elementary introduction to mathematical concepts that are used in the study of economics at UG level. This course will cover essential elementary topics in mathematics. The basic aim of the course is to develop skills in applying mathematical concepts that are indispensable for the in depth study of theoretical as well as empirical economics.

### **SYLLABUS**

#### **Module I Integral Calculus**

Concept of integration - Integral of single variable function - Definite integral as area under curve - properties - Indefinite integral as 'anti-derivative' - properties - rules of integration integration by substitution - integration by parts - application of integration in economics - relationship between total and marginal values - consumer's surplus and producer's surplus -present and discounted values. (38 hours)

Allen (1956) chapter 15, Yamane (2004) Chapter 6. Chiang. A.C (1988) chapter 13.

#### **Module II Matrix Algebra - I**

Definition of matrix - types of matrices - operation on matrices - determinants – properties -inverse of a matrix - Cramer's rule - Gauss elimination method - solving a system of linear equations (40 hours)

Yamane (2004) Chapter 10 Chiang. A.C (1988) Chapters 4 and 5.

### **Module III Matrix Algebra - II**

Linear independence and rank of matrix - characteristic root or Eigen value - quadratic forms - Sign definiteness - Optimisation conditions of quadratic forms subject to linear constraints.

( 30 hours)

Yamane (2004) Chapter 11. Chiang A.C (1988) Chapters 11 and 12.

### **Reference Books**

1. Allen. R.G.D (1956): "Mathematical Analysis for economists" Macmillan
2. Yamane, Taro (2004): "Mathematics for economists: an elementary survey", Prentice Hall of India.
3. Chiang. A.C (1988): "Fundamental Methods of Mathematical Economics", 3 ed. McGraw Hill

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|------------------------|-----------------------------------|
| <b>Course Title</b>    | <b>: MATHEMATICAL ECONOMICS-1</b> |
| <b>Course Category</b> | <b>: COMPLEMENTARY</b>            |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>    |
| <b>Course Code</b>     | <b>: 3C03 ECO</b>                 |
| <b>Semester</b>        | <b>: I11</b>                      |

### **Course Objectives**

This course is expected to provide students with an introduction to economic theory through the use of elementary mathematics. This course will cover essential elementary topics in micro economic theory. The basic aim of the course is to develop skills in applying mathematical concepts in microeconomic theory so that he/she will appreciate the theory more clearly which will help him/her apply them in real contexts.

### **SYLLABUS**

#### **Module I The theory of Consumer Behaviour**

The role of theory and mathematics in economics - the nature of utility function -indifference curve - existence of utility function - maximisation of utility - Derivation of demand curves - properties of demand function - ordinary and compensated demand curves - elasticities, types and measurements - Slutsky equation - direct and cross effects - substitutes and complements

Linear expenditure system - homogeneous and homothetic utility function - indirect utility function and duality in consumption - revealed preference theorem(37hours)

Henderson and Quandt (1980) Chapter 1 and 2

#### **Module II The theory of the firm**

Production functions and product curves - isoquants - elasticity of substitution - Cobb-Douglas, CES and Translog production function - Optimising behaviour of firms - input demand functions - Cost function - long run and short run - Duality in production. (34hours)

Henderson and Quandt (1980) Chapter 4 and 5. Heathfield and Wibe (1987) Chapters 3, 4, 5 and 6.

#### **Module III Market Structures**

Demand and Supply functions under perfect competition - Goods market and Factor market equilibrium- Monopoly - price discrimination - monopsony - monopolistic competition. (37 hours)

Henderson and Quandt (1980) Chapter 6 and 7

## **Reference Books**

1. Henderson, James M and Quandt, R E (1980): "Microeconomic Theory a mathematical approach", McGraw Hill Book Company.
2. Heathfield D.F and Wibe, Soren (1987): "An Introduction to Cost and Production functions" Macmillan.

## **Prerequisites**

Knowledge of elementary mathematics and microeconomic analysis

|                        |                                    |
|------------------------|------------------------------------|
| <b>Course Title</b>    | <b>: MATHEMATICAL ECONOMICS-11</b> |
| <b>Course Category</b> | <b>: COMPLEMENTARY</b>             |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>     |
| <b>Course Code</b>     | <b>: 4C04 ECO</b>                  |
| <b>Semester</b>        | <b>: IV</b>                        |

### **Course Objectives**

This course is expected to provide students with an introduction to economic theory through the use of elementary mathematics. This course will cover essential elementary topics in micro economic theory. The basic aim of the course is to develop skills in applying mathematical concepts to microeconomic theory so that he/she will appreciate the theory more clearly which will help him/her apply them in real contexts.

### **SYLLABUS**

#### **Module I Linear Programming**

Concept - Formulation of LPP - Solution of LPP, Graphical method, Simplex method -Duality - economic interpretation of dual - application and limitation of linear programming. (37 hours)

Chiang. A.C (1988) Chapters 19 and 20. Loomba (1971)

#### **Module II Input- Output Analysis**

The Model - transaction matrix - Components of final demand and value added - Solution to three sector model - open and closed model - static and dynamic model - technical viability -Hawkins-Simons conditions - application and limitation of the model. (37 hours)

Chiang. A.C (1988) Chapters 5. Kundu et.al (1976) Chapters 2, 3 and 4 Boumol (1987) Chapter22.

#### **Module III - Game Theory**

Concept - Two-person zero sum game - Maximin and Minimax strategy - Saddle point-Mixed strategies. (34 hours)

Allen R.G.D (1976) Chapter 15; Boumol W. J (1987) Chapter 18



### **Reference Books**

1. Allen R.G.D (1976): "Mathematical Economics" 2 ed., Macmillan
2. Boumol. W. J (1987): "Economic Theory and Operations Analysis", 4 ed., Prentice Hall of India.
3. Chiang. A.C (1988): "Fundamental Methods of Mathematical Economics", 3 ed. McGrawHill
4. Amithabh Kundu, P.N Mathur, G. S. Bhalla and Chalapathi Rao (1976): "Input Output Framework and Economic Analysis", Centre for the Study of Regional Development Jawaharlal Nehru University New Delhi.
5. Loomba N.P (1971): "Linear Programming", Tata McGraw Hill Publishing Company.

### **Prerequisites**

Knowledge of elementary mathematics and  
microeconomic analysis

|                        |                                   |
|------------------------|-----------------------------------|
| <b>Course Title</b>    | <b>: INTRODUCTORY ECONOMICS-I</b> |
| <b>Course Category</b> | <b>: COMPLEMENTARY</b>            |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>    |
| <b>Course Code</b>     | <b>: 1C05 ECO</b>                 |
| <b>Semester</b>        | <b>: I</b>                        |

### **Course Objectives**

This course is intended to provide students with the elementary ideas in Economic theory. It focuses on providing students with the basic knowledge of terms and concepts related to Economics. This paper deals with how individual economic agents reach equilibrium position

### **SYLLABUS**

#### **Module I**

Meaning and definitions of economics- the scope and subject matter of Economics- method - the Central problems of an Economy –Production possibility curve- Role of price mechanism- Functions and limitations of price mechanism. (15 hours)

#### **Module II : Demand analysis**

Meaning of demand-factors affecting demand-cardinal Utility approach: Law of Diminishing Marginal Utility-Law of equi marginal utility- Indifference curve Analysis-Indifference Schedule- Properties of Indifference Curve-Law of Demand-Elasticity of demand-price, cross and Income elasticity of Demand-Measurement of elasticity of demand-Consumer's surplus. (25 hours)

#### **Module III : Theory of production and cost**

Production function-factors of production: land, labour, capital and organisation: Its features-Laws of production: Law of variable proportions>Returns to scale-Economies of Scale-Cost and Revenue function-Types of costs-Long run and short run-Revenue and Revenue curves. (25 hrs)

**Module IV: Market forms-perfect Competition:** Equilibrium of the firm in the long run- Imperfect competition: price and output determination under Monopoly, Features of Monopolistic Competition: price and output determination under Monopolistic Competition. (25 hours)

## **Module V :Theory of Distribution**

Concept of distribution-Marginal productivity theory (general theory) of distribution-theories of Wages: subsistence theory, wage fund theory and modern theory- Theories of Rent: -Ricardian and Modern theories of rent, Quasi rent –Interest: Gross and Net interest-classical, Neo-classical and liquidity preference theory of interest- profits: Gross and Net profits-Theories of profits: risk bearing theory of profit, uncertainty bearing theory, dynamic theory. (18 hours)

### **Reference Books**

1. Modern Economic Theory (S.Chand)
2. I.G.Reynolds : Micro Economic Analysis and policy (UBS)
3. Ahuja H L :Advanced Economic Theory (S.Chand)
4. Watson : Price theory and its

|                        |                                    |
|------------------------|------------------------------------|
| <b>Course Title</b>    | <b>: INTRODUCTORY ECONOMICS-II</b> |
| <b>Course Category</b> | <b>: COMPLEMENTARY</b>             |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>     |
| <b>Course Code</b>     | <b>: 2C06 ECO</b>                  |
| <b>Semester</b>        | <b>: I</b>                         |

### **Course Objectives**

With this course students are expected to learn the simple relationship and ideas in the measurement of National income, banking, finance and development issues of Indian economy. It is designed to introduce the fundamental concepts of Macro economics. The course aims at developing basic principles of economic reasoning.

### **SYLLABUS**

**Module I** National income Accounting- variants of National income [GNP, NNP, NI, Personal Income, Disposable Income, per-capita income]- Computation of NI- Difficulties and limitations- National income as a development indicator. (15 hours)

**Module II** Money and Banking-Meaning of money-type, role and functions of money-Inflation and deflation-functions of commercial banks- -Modern trends in commercial banking- Central Banks - Role and functions of RBI--Instruments of credit control-Quantitative methods [Bank rate, open market operations, Repo rate, Reverse repo rate, CRR, SLR ]- Qualitative or selective credit control methods. (28 hours)

**Module III** Public finance-Scope and subject matter-sources of public revenue -public expenditure -public debt-purposes of public debt and methods of debt redemption- Budget-types and principles of budgeting (25 hours)

**Module IV** International trade- Importance of International trade- Balance of trade and Balance of payments. Disequilibrium in Balance of payments-Measures to correct disequilibrium in Balance of payments (15 hours)

**Module V** Development issues of Indian economy- Poverty, Inequality, Unemployment and Black money (25 hours)

#### **Reference Books**

1. K.K.Dewett- Essentials of Macro Economics (for Module I) S. Chand
2. K.K.Dewett- Modern Economic Theory (S.Chand)
3. Misra and puri- IndianEconomy
4. KPM Sundaram: Public Finance

|                        |                                         |
|------------------------|-----------------------------------------|
| <b>Course Title</b>    | <b>: HISTORY OF ECONOMIC THOUGHT- I</b> |
| <b>Course Category</b> | <b>: COMPLEMENTARY</b>                  |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>          |
| <b>Course Code</b>     | <b>: 3C07 ECO</b>                       |
| <b>Semester</b>        | <b>: I11</b>                            |

### **Course Objectives:**

The course aims to give an insight into the evolution of economic theory from the earliest times to the present day. It assists the student in tracing the origin and development of Economics and in understanding its nature, scope and relationship with other sciences. The subject broadens human vision and creates new possibilities of further contribution to the development of the science.

### **SYLLABUS**

**Module I Preclassical Economics** Ancient Economic Thought: Hebrew, Greek and Roman. Medieval Economic Thought-Islamic Economic Thought-Scholasticism: St. Thomas Aquinas. Basics of Mercantilism and Physiocracy. (30 hours)

**Module II Classical Economics and its critics** Adam Smith: Naturalism and Optimism, division of labour, productive and unproductive labour, theory of value, theory of distribution, theory of taxation, theory of economic growth- relevance of 'Wealth of Nations'. David Ricardo: Theory of value, theory of distribution, theory of rent, theory of economic development, theory of money, theory of foreign trade. T R Malthus: theory of population, theory of glut-J B Say: law of markets. Jeremy Bentham-J S Mill-Critique of Classicism(48 hours).

**Module III Socialist Economic Thought** Early Socialists: St. Simon and Sismondi. Utopian Socialists: Robert Owen, Charles Fourier, Proudhon and Louis Blanc. State Socialists: Rodbertus and Lassalle. Karl Marx and Scientific Socialism: Dialectical materialism, labour theory of value, theory of surplus value, theory of profit and industrial crisis- theory of economic development. Lenin's theory of Imperialism-Democratic Socialism (30 hours)

### **Reference Books**

1. Haney, Lewis (1949) History of Economic Thought, Macmillan

2. Barber, William (2009) A History of Economic Thought, Wesleyan University Press
3. Eric Roll (1961) A History of Economic Thought, Prentice-Hall, New York
4. Lekachman Robert (1989) A History of Economic Ideas, McGraw Hill
5. Landreth, Harry; Colander, David (2002). History of Economic Thought. 4th Edition. Houghton Mifflin
6. Sandelin, Bo; Trautwein, Hans; WUNDRAK, Richard (2008). A Short History of Economic Thought. 2nd Edition. Routledge.
7. Hajela T N (2008) History of Economic Thought, 17<sup>TH</sup> ed. Ane Books India
8. Hollis, Martin (2008). The Philosophy of Social Science: an introduction. Revised and Updated. Cambridge University Press.

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|------------------------|------------------------------------------|
| <b>Course Title</b>    | <b>: HISTORY OF ECONOMIC THOUGHT- II</b> |
| <b>Course Category</b> | <b>: COMPLEMENTARY</b>                   |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b>           |
| <b>Course Code</b>     | <b>: 4C08 ECO</b>                        |
| <b>Semester</b>        | <b>: IV</b>                              |

### **Course Objectives**

The course aims to give an insight into the evolution of economic theory from the earliest times to the present day. It assists the student in tracing the origin and development of Economics and in understanding its nature and scope and relationship with other sciences. The subject broadens human vision and creates new possibilities of further contribution to the development of the science.

### **SYLLABUS**

**Module I Reconstruction of Economic Science-Subjectivism and Marginalism** Early developments in the Marginal utility concept-Gossen, Jevons, Walras, J B Clark, Pareto and the Mathematical School. The Austrian School: Menger, Wieser and Bohm-Bawerk. The Swedish School: Wicksell and Wicksteed. Veblen and Institutionalism: (48 hours)

**Module II Neoclassical and Keynesian Economics** Neoclassical School: Marshall, Pigou and Irving Fisher. Keynesian Economics: Theory of Employment –Multiplier (30 hours)

**Module III Indian Economic Thought** Ancient Indian Economic Thought: Kautilya and Thiruvalluvar. Modern Indian Economic Thought: Dada Bai Naoroji, M G Ranade, M K Gandhi, J K Mehta, Amartyasen (30 hours)

### **Reference Books**

1. Haney, Lewis (1949) History of Economic Thought, Macmillan
2. Barber, William (2009) A History of Economic Thought, Wesleyan University Press
3. Eric Roll (1961) A History of Economic Thought, Prentice-Hall, New York
4. Lekachman Robert (1989) A History of Economic Ideas, McGraw Hill

5. Landreth, Harry; Colander, David (2002). History of Economic Thought. 4th Edition. Houghton Mifflin
6. Sandelin, Bo; Trautwein, Hans; Wundark, Richard (2008). A Short History of Economic Thought. 2nd Edition. Routledge.
7. Hajela T N(2008) History of Economic Thought, 17<sup>TH</sup> ed. Ane Books India
8. Hollis, Martin (2008). The Philosophy of Social Science: an introduction. Revised and Updated. Cambridge University Press.



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|------------------------|--------------------------------|
| <b>Course Title</b>    | <b>: POPULATION STUDIES</b>    |
| <b>Course Category</b> | <b>: COMPLEMENTARY</b>         |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b> |
| <b>Course Code</b>     | <b>: 1C09 ECO</b>              |
| <b>Semester</b>        | <b>: 1</b>                     |

### Course Objectives

The main objective of the course is to impart knowledge of basic concepts, scope, nature and subject matter of population studies. The modules incorporated in the course will enrich the knowledge of the students on different measures of fertility and mortality, migration, urbanization and population growth trends in Kerala, India and the world.

### SYLLABUS

**Module 1-Introduction** Population Study and Demography-meaning, nature, scope and importance-subject matter of population study: size, structure, characteristics and distribution of population-components of population change: fertility, mortality and migration. Sources of population data: census, sample surveys, registration of vital events and NPR. Theories of population: Malthusian Theory of Population, Optimum Theory of Population and Theory of Demographic Transition-Interrelationship between population and Economic Development. (40 hours)

**Module-II Measures of Fertility and Mortality** Measures of Fertility: Crude Birth Rate, General Fertility Rate, Age Specific Fertility Rate, Total Fertility Rate, Gross Reproduction Rate and Net Reproduction Rate. Measures of Mortality: Crude Death Rate, Age specific Mortality Rate and Infant Mortality Rate-Life expectancy(13 hours)

**Module III Migration and Urbanisation** Migration-concepts, types, determinants and consequences-Differential migration-Theories of migration Evert Lee's Theory of Migration-Ravenstein's Laws of Migration, Urbanisation-concepts, definition, causes and consequences of urbanization-measurement of urbanization (30 hours)

**Module IV Trends in Population Growth** Growth trends in population in Kerala, India and the World-Patterns of Age and sex structure in Kerala and India- Ageing -National Population Policy in India-Family welfare programmes- -Population Pyramid - Population Projection-methods and uses. (25 hours)

### Reference Books

1. A K Shiva Kumar, Pradeep Panda and Rajani R Ved (ed) 'Handbook of Population and Development in India' Oxford, 2011
2. A.A. Bhende and T. Kanitkare, Principles of Population Studies, Himalaya, 1982.
3. D.J. Bogue, Principles of Demography, Wiley, 1971.

4. B.D. Misra, An Introduction to the Study of Population, South Asian Publishers, 1980.
5. S. Nagarwal, India's Population Problem, Tat McGraw Hill, 1985.
6. Government of India, Census of India and Related Monographs and Reports.
7. U.N. Methods of Measuring Internal Migration, 1979. 8. Y. Davis, World Urbanization: 1950-70, Vol. II, Population Monograph Series. No. 9, University of California.
8. S.N. Agarwala , India's Population Problem, Tat McGraw Hill, 1972.
9. A.J. Coale and E.M. Hoover, Population Growth and Economic Development in Low Income Countries: A Case Study of India's Prospects' Princeton, 1958.
10. K. Srinivasan and K.B. Pathak (Ed.), Dynamics of Population and Family Welfare, Himalaya, 1992.
11. Publications on the Demographic Aspects and Working Papers of the Centre for Development Studies, Thiruvananthapuram.
12. R.S. Kurup et al. Fact Book on Population and Family Planning, Bureau of Economics and Statistics, 1974.

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|------------------------|------------------------------|
| <b>Course Title</b>    | <b>:REGIONAL ECONOMICS</b>   |
| <b>Course Category</b> | <b>:COMPLEMENTARY</b>        |
| <b>Credit</b>          | <b>:4(108 contact hours)</b> |
| <b>Course Code</b>     | <b>: 2C10 ECO</b>            |
| <b>Semester</b>        | <b>:11</b>                   |

## **SYLLABUS**

### **Module – I**

Regional economic analysis – objectives and scope – different type of regions – indicators of Regional development – inter-disciplinary aspects of regional economics – problems and causes of regional economic development .(20 Hours)

### **Module – II**

Regional economic development theories – cumulative causation (Myrdal, Hirschman), Export base theory, central place theory (Christaller), sector theory (Kuznets), stage theory (Rostow) – location theories – Weber’s theory, Spatial dispersion, innovation and technical progress, sectoral growth, Urban bias.(35 Hours)

### **Module – III**

Regional disparities – trends in regional disparities in income – inter-state variation of poverty and unemployment in India – agricultural and industrial development in different states in India, a comparative analysis.(25 Hours)

### **Module – IV**

Regional imbalances – Regional economic advantages and optimization – problems of development of backward areas – planning for regional development – Five Year Plans and regional development in India – measures taken by India govt for regional development with special focus on Kerala. (28 Hours)

### **Reference Books**

- (1) Beckman, M, Location Theory, Random House, London.
- (2) Bhalla, G.S. and Y.K. Alagh, Performance of Indian Agriculture: A District-wise Study, Sterling, New Delhi.
- (3) Brahmananda, P.R. and Panchmukhi, Development Experience in the Indian
- (4) Chand, M. and V.K. Puri, Regional Planning in India, Allied Publishers, New Delhi.
- (5) Dholakia, R.H, Regional Disparity in Economic Growth in India, Himalaya Publishing House, Bombay.Economy, Bookwell, New Delhi.
- (6) Friedman, J. and W. Alonso (Eds.), Regional Policy, Readings in Theory and Application, MIT Press, Cambridge, Mass.

- (7) Glasson, J, An Introduction to Regional Planning : Concepts, Theory and Practice, Hutchison, London.
- (8) Hoover, E.M, An Introduction to Regional Economics, Alfred A. Knopf, New York.
- (9) Isard, W, Methods of Regional Analysis, MIT Press, Cambridge, Mass.
- (10) Misra R.P, Regional Development Planning in India, Vikas, New Delhi.
- (11) Myrdal G, Economic theory and Underdeveloped Regions, Vora, New Delhi.
- (12) Nair, K.R.G, Regional Experience in a Developing Economy, Wiley-Eastern, New Delhi.
- (13) Rao, H, Regional Disparities and Development in India, Ashish Publishing House, New Delhi.
- (14) Richardson, Elements of regional economics, Penguin books, London
- (15) Richardson, H.W, Regional Economics, Weidenfield and Nicolson, London.
- (16) Seth, V.K, Industrialisation in India: A Spatial Perspective, Commonwealth Publishers, New Delhi.
- (17) Siebert, H, Regional Economic Growth: Theory and Policy, International Textbook Company, Scranton.
- (18) Williamson, J.G, 'Regional Inequality and the Process of National Development,' Economic Development and Cultural Change, Vol. 13, No.4, part II, July.

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Websites of NIRD, Agricultural Network Information Centre, State Planning Board, Planning Commission, etc.

Current articles related to various modules in EPW, Indian Journal of Rural Development, Agricultural Situations in India, Yojana, etc.

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|------------------------|--------------------------------|
| <b>Course Title</b>    | <b>:AGRICULTURAL ECONOMICS</b> |
| <b>Course Category</b> | <b>:COMPLEMENTARY</b>          |
| <b>Credit</b>          | <b>: 4 (108 contact hours)</b> |
| <b>Course Code</b>     | <b>: 3C11 ECO</b>              |
| <b>Semester</b>        | <b>: 111</b>                   |

## **SYLLABUS**

### **Module – I**

Agricultural Economics – nature and scope – role and importance of agriculture in economic development – inter-linkage between agricultural and non- agricultural sector – models of interaction between agriculture and rest of the economy. (15 Hours)

### **Module – II**

Agrarian relations – land reforms with special focus on India and Kerala – technology in agriculture – green revolution – sustainable agriculture – emerging trends in agricultural technology – biotechnology. (25 Hours)

### **Module – III**

Agricultural production and productivity – production function in agriculture – production relationships – types of farming – subsidies – input subsidies and Indian agriculture – crop insurance – Agricultural finance – Agricultural marketing – structure and problems of Agricultural finance and marketing in India – WTO and Indian agriculture – challenges and prospects. (35 Hours)

### **Module – IV**

Agricultural performance of India and Kerala – Five Year Plans and Indian agriculture – crop diversification – organic farming – farm management – Agricultural extension – food security – New Economic Policy and agriculture – Agricultural policy – informatics in agriculture – Self Help Groups and Kerala agriculture (33 Hours)

### **Reference Books**

1. BA Prakash, Kerala economic Development, performance and problems in the post liberalization period, Sage publishing co.
2. BA Prakash, Kerala economy problems and prospects, Sage publishers.
3. Bhalla, G.S, Economic Liberalisation and Indian Agriculture, Institute for Studies in Industrial Development, New Delhi.
4. Bhalla, G.S, Indian Agriculture Science Independence, National Book Trust, India, New Delhi.

5. Chaudhary, P, Readings in Indian Agricultural Development, George Allen & Unwin, London.
6. Karunakaran. N (2013), "Change in cropping pattern and food security – a challenge to poor population: a Kerala experience", *Social Action*, Vol. 63, No 1, PP: 48-58
7. Karunakaran. N (2013), "Change in cropping pattern and food security – a Kerala experience", *Journal of Development Research*, Vol. 5, No. 1, PP: 11-19.
8. Karunakaran. N (2013), "Crop Diversification and chemical pollution: A conflict in the sustainability of the agricultural sector of Kerala", *Indian Journal of Social Development*, Vol. 12, No. 2, PP: 357-368.
9. MA Oommen, Kerala Development Experience II, Concept publishing co.Oommen, Kerala economy Since independence, Oxford and IBH Publishing Co.
10. Mani KP (2009), "Cropping pattern in Kerala - spatial inter-temporal analysis", *Kerala Economy: Trends during the post-reform period* (Ed), by Rajan K, Serials Publications, New Delhi, PP: 64-84.
11. Mohandas M (2005), "Agricultural Development in Kerala", in *Kerala Economy-Trajectories, Challenges and Implications* (Ed), by Rajasenan D and Gerald de Groot
12. R.N. Soni, *Leading Issues in Agricultural Economics*, Vishal Publications, Jalandhar.
13. Srikumar Chattopadhyay and Richard W Franke (2006), "Causes of concern: land use change", *Striving for sustainability, Environmental stress and Democratic initiatives in Kerala*, Concept Publishing Company, New Delhi, PP: 89-135
14. Uppal, J.S. (Ed.), *India's Economic Problems — An Analytical Approach*, Tata McGraw Hill, New Delhi.
15. Vaidyanathan, A, *The Indian Economy: Crisis, Response and Prospects*, Orient Longmans, New Delhi.

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 Websites of Agricultural Statistics, Agricultural Network Information Centre, State Planning Board, Planning Commission, etc  
 Current articles related to various modules in EPW, Indian Journal of Agricultural Economics, Agricultural Situations in India, Yojana, etc.

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|------------------------|-------------------------------|
| <b>Course Title</b>    | <b>:GENDER ECONOMICS</b>      |
| <b>Course Category</b> | <b>:Complementary Course</b>  |
| <b>Credit</b>          | <b>:4 (108 contact hours)</b> |
| <b>Course Code</b>     | <b>: 4C12 ECO</b>             |
| <b>Semester</b>        | <b>:IV</b>                    |

### **Course Objectives**

The objective of this course is to introduce gender perspectives in understanding and analysing of economic theory and policy. It aims to help the students to analyse the role of women in the economy and evaluate the programmes and policies for women empowerment from feminist perspective.

### **SYLLABUS**

#### **Module-I Introduction to Gender Economics**

Need and importance of Gender Economics - Distinction between gender and sex-Patriarchal and Matriarchal families- Basic concepts-Female work participation rate-Measurement- GDI and GEM.(15 hours)

#### **Module –II Women and work**

Women and work-Discrimination in the labour market- concept of head of household-concepts of work-paid and unpaid work-visible and invisible- economically and socially productive work-valuation of women’s work--women’s contribution to Indian economy and National income(25 hours)

#### **Module –III Women, Demography and Nutrition**

Demography of female population in developing countries-differentials in sex ratio-mortality, morbidity and life expectancy in India- Intra household inequalities in access to education, health and nutrition-nutritional deficiency- National Rural Health Mission –Equity in health delivery system(35 hours)

#### **Module- IV Women Empowerment**

Concept of women empowerment- dimensions- Education and empowerment – issues related to women’s education-Access-enrolment-dropouts-Women empowerment programmes in India with particular reference to Kerala – Role of Government, NGOs and Self Help Groups in women Empowerment.(33 hours)

## **Reference Books**

1. National Commission for Women ,Towards Equality- The Unfinished Agenda- Status of women in India -2001 , ,New Delhi ,(2002)
2. Peterson J and M Lewis (ed), The Elgar Companion to Feminist Economics (2001)
3. Agarwal ,Bina ,(1994)A field of one's own Gender and Land Rights in south Asia ,Cambridge University Press,New Delhi
4. Boserup.E.(1970),Women's role in Economic Development,George Allen and Unwin ,London
5. Desai,N. and M.K.Raj(1974),Women and Society in India,Research Centre for Women Studies, SNTD University, Bombay
6. Government of India (1974), Towards Equality-Report of the Committee on the Status of Women in India,Department of Social Welfare, Ministry of Education and Social Welfare, New Delhi.  
Krishnaraj.M,R.MSudarshan and A.Shariff(1999),Gender,Population and Development ,Oxford University Press,New Delhi
7. Seth .M.(2000), Women and Development : The Indian Experience ,Sage Publications, New Delhi .
8. Srinivasan ,K and A.Shroff( 1998), India ;Towards population and Development Goals,Oxford University Press,New Delhi
9. Venkateswaran,S(1995), Environment Development and Gender Gap, Sage Publications, New Delhi.
10. Wazir, R, (2000), The Gender Gap in Basic Education; NGOs as Change Agents, Sage Publications, New Delhi
11. Govt.ofIndia ,Ministry of Family Welfare , (2009), Gender Equality and Women's Empowerment in India ,National Family Health Survey 2005-06.
12. Das,Kumar, (2009)Gender Dynamics in Economic Development of India ,Reference Press,New Delhi
13. Pal Manoranjanet,al ., (2012) Gender and Discrimination – Health,Nutritional Status and Role of Women in India,Oxford University PressNew Delhi.
14. Sen, Sujata(2012),Gender Studies Dorling Kindersley(India) Pvt.Ltd&Pearson Education in South Asia
15. Sen ,Suvarna (2006), Gender and Development,ICFAI University Press,Hyderabad.
16. Various Issues of Economic and Political Weekly.



# ***OPEN COURSES***

|                         |                                        |
|-------------------------|----------------------------------------|
| <b>Course Title:</b>    | <b>ECONOMICS OF TRAVEL AND TOURISM</b> |
| <b>Course Category:</b> | <b>Open course</b>                     |
| <b>Credit:</b>          | <b>: 2</b>                             |
| <b>Course Code</b>      | <b>: 5D01 ECO</b>                      |
| <b>Semester</b>         | <b>:V</b>                              |

## **SYLLABUS**

### **Module I**

Definition and concept of tourism – Tourist and Excursionist. Types of Tourism. Forms of Tourism – Domestic, Inbound and Outbound Tourism – Motivations for Tourism – Major tourism centers in Kerala.

### **Module II**

Tourism as an Industry – Components of Tourism - Concepts of Tourism product – Characteristics of tourism product – Demand and supply characteristics – Factors affecting demand for tourism.

### **Module III**

Planning and development of tourism in India – Techniques of tourism planning. Tourism Marketing – Market segmentation and Tourism market mix. Travel agency and Tour operators – Types – Functions of a travel agency.

### **Module IV**

Tourism impacts – Political, Social, Cultural, Environmental and Economic impacts – Tourism Multiplier. National and International tourism concerns and problems. National and International tourism organizations – WTO – PATA – IATA – WTTC – Role and functions of Ministry of Tourism – ITDC – KTDC – DTPC

### **Reference Books**

#### **Module I**

1. Tourism and travel management – Bishwanath Ghosh – Vikas Publications House Pvt. Ltd.
2. Successful Tourism Vol 1 – Pran Nath Seth – Sterling Publishers Pvt. Ltd, New Delhi.

3. Tourism Management – P.J. Sangar – Anmol Publications Pvt. Ltd. – New Delhi.
4. An Introduction to Travel and Tourism – Pran Nath Seth and Sushma Seth Bhat.
5. International Tourism Management – A.K. Bhatia - Sterling Publishers Pvt. Ltd, New Delhi.
6. International Tourism and Travel – Jagmohan Negi – S. Chand and Company Ltd, New Delhi.

### **Module II**

1. Tourism Management – P.J. Sangar – Anmol Publications Pvt. Ltd. – New Delhi.
2. International Tourism Management – A.K. Bhatia - Sterling Publishers Pvt. Ltd, New Delhi.
3. Tourism Economics – Sipra Mukhopadhyay – Ann Books India
4. Infrastructure of Tourism in India – Ratandeep Sing – Kanishka Publishers, New Delhi.
5. The Business of Tourism - A.K. Bhatia - Sterling Publishers Pvt. Ltd, New Delhi.
6. Principles of Tourism Development – M.A. Khan – Anmol Publications Pvt. Ltd, New Delhi.

### **Module III**

1. Tourism Management – P.J. Sangar – Anmol Publications Pvt. Ltd. – New Delhi.
2. Successful Tourism Vol 1 – Pran Nath Seth – Sterling Publishers Pvt. Ltd, New Delhi.
3. An Introduction to Travel and Tourism – Pran Nath Seth and Sushma Seth Bhat.
4. International Tourism Management – A.K. Bhatia - Sterling Publishers Pvt. Ltd, New Delhi.
5. International Tourism and Travel – Jagmohan Negi – S. Chand and Company Ltd, New Delhi.

### **Module IV**

1. Tourism and Hospitality Industry – Sudhir Andrews – Tata Mcgraw Hill, New Delhi
2. Successful Tourism Vol 1 – Pran Nath Seth – Sterling Publishers Pvt. Ltd, New Delhi.
3. Tourism Management – P.J. Sangar – Anmol Publications Pvt. Ltd. – New Delhi.
4. An Introduction to Travel and Tourism – Pran Nath Seth and Sushma Seth Bhat.
5. International Tourism and Travel – Jagmohan Negi – S. Chand and Company Ltd, New Delhi.
6. International Tourism Management – A.K. Bhatia - Sterling Publishers Pvt. Ltd, New Delhi.

|                         |                       |
|-------------------------|-----------------------|
| <b>Course Title:</b>    | <b>KERALA ECONOMY</b> |
| <b>Course Category:</b> | <b>Open course</b>    |
| <b>Credit:</b>          | <b>2</b>              |
| <b>Course Code:</b>     | <b>: 5D02 ECO</b>     |
| <b>Semester</b>         | <b>:V</b>             |

### **Course Objectives**

This course will enable non economics students to understand the economy of Kerala in relation to national and international development. It will help the students to get a clear picture about the performance of Kerala economy from the period of state formation till post liberalisation period.

### **SYLLABUS**

#### **Module-I**

##### **Kerala in the National Economy**

Significant features of Kerala economy since state formation-Kerala as a developmental model: debates on the existence and sustainability of Kerala model

#### **Module II**

##### **Sectoral composition of Kerala economy**

Role of agriculture sector: debates on stagnation and growth – trends in the industrial sector- significance of service sector: health and education; banking sector- liberalisation policies and its impact on service sector.

#### **Module III**

##### **Developmental Issues in Kerala**

Demographic transition –Migration- Poverty- Unemployment- public distribution system- energy crisis- role of state in the process of development since 1990's- issues of privatisation- Decentralised governance and its impact on Kerala economy- impact of globalisation on Kerala economy.

### **References Books**

#### **Module I**

Jeffery Robin, 1992, *Politics, women and wellbeing, How Kerala became a model*, Oxford university press, Delhi

George k k, 1999, *Limits to Kerala model of development: an analysis of fiscal crisis and its implications*, centre for development studies Trivandrum

Joseph Tharamangalam, (ed) 2006, *Kerala the paradoxes of public action and development*, orient Longman

E T Mathew, *Features of Kerala Economy*, Economic and Political Weekly, Vol - XXX No. 49, December 09, 1995

Achin chakraborty, *Kerala's changing development narratives*, Economic and Political Weekly, Vol-XL, No: 6, February 05, 2005

KRG NAIR, *Kerala development experience*, Economic and Political Weekly, Vol - XL No. 30, July 23, 2005

### **Module II**

Jeromi P.D , *what ails Kerala economy?: a sectoral exploration*, Economic and Political Weekly, Vol-XXXVIII, no.16, April 19, 2003

K K subrahmanian, *Development paradox in Kerala, Analysis of industrial stagnation*, Economic and political weekly, Vol: XXV ,No: 37,September 15,1990.

Joseph Tharamangalam, (ed) 2006, *Kerala the paradoxes of public action and development*, orient Longman

### **Module III**

Jospeh Tharamangalam, *Is food security in Kerala a Myth?*, Economic and Political Weekly, Vol-XLVI, no.20, may 14, 2011.

K J Joseph and K N Harilal, *Stagnation and revival of Kerala economy*, Economic and Political Weekly, Vol -XXXVIII, No: 23,june 07,2003

K P Kannan, *Agricultural development in an emerging non agrarian economy: kerala's challenges*, Economic and Political Weekly, Vol-XLVI, No: 09, February 26, 2011

N Jayaram, *Gulf Migration Impact on Kerala economy*, Economic and Political Weekly,Vol-XLVIII ,No: 09,March 02,2013

Jeffery Robin, 1992, *Politics, women and wellbeing, How Kerala became a model*, Oxford university press, Delhi

B A Prakash, *Gulf migration and its economic impact: The Kerala Experience state*, Economic and Political Weekly, Vol.XXXIII, No: 50, december12, 1998.

P Balakrishnan, *Land reforms and the question of food in Kerala*, Economic and political weekly, Vol.XXXIV, No.21, may 22 1999.

P D Jeromi, *Economic reforms in Kerala*, Economic and political weekly, Vol.XL, No: 30july 23, 2005

K P Kannan, *Declining incidence of poverty in kerala*, Economic and political weekly, Vol .XXX, No>41-42,October 14,1995

P N Mari Bhat S Irudaya Rajan, *Demographic transition in Kerala revisited*, Economic and political weekly, Vol - XXV No. 35-36, September 01, 1990

KPK, *Kerala's growing food deficit*, Economic and political weekly, Vol - XXII No. 18, May 02, 1987

Achin chakraborty, *Issues in social indicators, composite indices and inequality*, Economic and political weekly, Vol - XXXVII No. 13, March 30, 2002 |

Joseph Tharamangalam, (ed) 2006, *Kerala the paradoxes of public action and development*, orient Longman

Oommen M A(ED), 1999, *Rethinking development: Kerala's experience*, vol.1 & II, new Delhi: Institute of social sciences.

|                        |                                  |
|------------------------|----------------------------------|
| <b>Course Title:</b>   | <b>ECONOMICS OF SHARE MARKET</b> |
| <b>Course Category</b> | <b>Open course</b>               |
| <b>Credit:</b>         | <b>2</b>                         |
| <b>Course Code</b>     | <b>:5D03ECO</b>                  |
| <b>Semester</b>        | <b>:V</b>                        |

### **Course Objective**

This course is meant for the students to understand the meaning and importance of Investment and its avenues.

## **SYLLABUS**

### **Module I**

**Investment** – Meaning – Nature of investment – Objectives of investment - Types of investment – Investment avenues ( corporate securities, deposits, mutual fund, post office deposit, life insurance policies, P F schemes, govt. and semi govt. securities, derivative instruments) – Investment v/s Speculation – Risk and its types.

### **Module II**

**Financial System** – Structure of financial system – Financial markets, types (spot market, future market, capital market, primary market, secondary market, private market, public market) – Financial institutions – Financial instruments – Financial services.

### **Module III**

**Money market** – Meaning– Structure of money market (organised and unorganised) – Money market instruments ( T-bills, bill of exchange, promissory notes, CP, CDs) Discount and Finance House of India.

### **Module IV**

**Capital Market** – Meaning -- Nature – Money market v/s Capital market – Capital market instruments (industrial securities and gilt edged securities) – Types of Capital market – Primary market – Meaning – functions – Method of floatation ( Public issues through prospectus, Offer for sale, Private placement, Right issue, e-IPOs.) – Book building – Bonus issue – Operators in primary market.

## **Module V**

**Secondary market** – Meaning — Primary market v/s Secondary market - Stock exchange- Functions of Stock exchange – Stock exchanges in India – Trading procedure on a stock exchange - Types of speculators – Types of orders – OTCEI, NSE, NSDL – Stock market indices– SEBI–Purpose– Functions.

### **Reference Books**

1. Investment Management – Preeti Singh
2. Financial Markets, Institutions and Financial Services – Clifford Gomez.
3. Financial Institutions and Markets – L M Bhole and Jitendra Mahakud
4. Investment Management – V K Bhalla.



### **Evaluation:**

The evaluation scheme for each course shall contain two parts;

- i. Internal Assessment (**IA**) and
- ii. External Evaluation or End Semester Evaluation (**ESE**).

20% weightage shall be given to the internal assessment and the remaining 80% weightage shall be for the external evaluation. Evaluation (both Internal and External) is carried out using Mark System instead of direct grading. For each course in the semester letter grade, grade point and % of marks are introduced in 7- point Indirect Grading System. Indirect Grading System in 7 point scale is as below:

#### **Seven Point Indirect Grading System**

| <b>% of Marks</b> | <b>Grade</b> | <b>Interpretation</b> | <b>Grade Point Average (G)</b> | <b>Range of Grade Points</b> | <b>Class</b>                 |
|-------------------|--------------|-----------------------|--------------------------------|------------------------------|------------------------------|
| 90 and above      | A+           | Outstanding           | 6                              | 5.5 – 6                      | First class with Distinction |
| 80 to below 90    | A            | Excellent             | 5                              | 4.5 - 5.49                   |                              |
| 70 to below 80    | B            | Very good             | 4                              | 3.5 - 4.49                   | First class                  |
| 60 to below 70    | C            | Good                  | 3                              | 2.5 - 3.49                   |                              |
| 50 to below 60    | D            | Satisfactory          | 2                              | 1.5 - 2.49                   | Second class                 |
| 40 to below 50    | E            | Pass / Adequate       | 1                              | 0.5 - 1.49                   | Pass                         |
| Below 40          | F            | Failure               | 0                              | 0 - 0.49                     | Fail                         |

Marks allotted for internal and external evaluation for core and open courses are given below:

**Mark Distribution of Internal and External Evaluation of Core & Open Courses**

| SL. No  | Semester | Course Code  | Title of the course                                   | Mark Distribution |     |       | Exam hrs |       |
|---------|----------|--------------|-------------------------------------------------------|-------------------|-----|-------|----------|-------|
|         |          |              |                                                       | IA                | ESE | Total |          |       |
| 1       | I        | 1B01ECO      | Micro Economic Analysis-I                             | 10                | 40  | 50    | 3        |       |
| 2       | II       | 2B02ECO      | Micro Economic Analysis-II                            | 10                | 40  | 50    | 3        |       |
| 3       | III      | 3B03ECO      | Macro Economic Analysis-I                             | 10                | 40  | 50    | 3        |       |
| 4       | III      | 3B04ECO      | International Economics                               | 10                | 40  | 50    | 3        |       |
| 5       | IV       | 4B05ECO      | Macro Economic Analysis-II                            | 10                | 40  | 50    | 3        |       |
| 6       | IV       | 4B06ECO      | Environmental Economics                               | 10                | 40  | 50    | 3        |       |
| 7       | V        | 5B07ECO      | Basic Tools for Economic Analysis-I                   | 10                | 40  | 50    | 3        |       |
| 8       | V        | 5B08ECO      | Alternative Economics                                 | 10                | 40  | 50    | 3        |       |
| 9       | V        | 5B09ECO      | Research Methods and Techniques for Economic Analysis | 10                | 30  | 10*   | 50       | 2 + 1 |
| 10<br>1 | V        | 5B10 ECO     | Development Economics                                 | 10                | 40  | 50    | 3        |       |
|         | V        | 5B10DEV ECO  | Economics of Development and Planning -I              | 10                | 40  | 50    | 3        |       |
| 11      | V        | 5B11ECO      | Economics of Banking and Finance                      | 10                | 40  | 50    | 3        |       |
| 12      | VI       | 6B12ECO      | Basic Tools for Economic Analysis-II                  | 10                | 40  | 50    | 3        |       |
| 13      | VI       | 6B13 ECO     | Central Themes in Indian Economy                      | 10                | 40  | 50    | 3        |       |
|         | VI       | 6B13DEV ECO  | Economics of Development and Planning -II             | 10                | 40  | 50    | 3        |       |
| 14      | VI       | 6B14ECO      | Public Economics                                      | 10                | 40  | 50    | 3        |       |
| 15      | VI       | 6B15ECO      | Basic Econometric Analysis                            | 10                | 40  | 50    | 3        |       |
| 16      | VI       | 6B16ECO (Pr) | Project                                               | 20                | 05  | 25    |          |       |

★ Practicals

**Internal Assessment (IA)**

The internal assessment of theory courses and project shall be based on different components. The components with percentage of marks and marks allotted are as follows:

### Theory Courses

| SN           | Components                       | % of Marks allotted | Marks Allotted |             |
|--------------|----------------------------------|---------------------|----------------|-------------|
|              |                                  |                     | Core courses   | Open course |
| 1            | Attendance                       | 25                  | 2.5            | 1.25        |
| 2            | Assignment/<br>Seminar/Viva voce | 25                  | 2.5            | 1.25        |
| 3            | Test paper                       | 50                  | 5              | 2.5         |
| <b>Total</b> |                                  | <b>100</b>          | <b>10</b>      | <b>5</b>    |

### Project

| SN           | Components                    | % of Marks allotted | Marks Allotted |
|--------------|-------------------------------|---------------------|----------------|
| 1            | Punctuality                   | 20                  | 1              |
| 2            | Use of Data                   | 20                  | 1              |
| 3            | Scheme/Organization of Report | 30                  | 1.5            |
| 4            | Viva-Voce                     | 30                  | 1.5            |
| <b>Total</b> |                               | <b>100</b>          | <b>5</b>       |

Criteria for evaluating Attendance, Assignment/Seminar/Viva-voce and Test papers are given below:

**Attendance:** Attendance of each Course will be evaluated as below:

| SN | % of Attendance | % of Marks allotted | Marks Allotted |      |
|----|-----------------|---------------------|----------------|------|
|    |                 |                     | Core           | Open |
| 1  | Above 90        | 100                 | 2.5            | 1.25 |
| 2  | 85 to 89        | 80                  | 2              | 1    |
| 3  | 80 to 84        | 60                  | 1.5            | 0.75 |
| 4  | 76 to 79        | 40                  | 1              | 0.5  |
| 5  | 75              | 20                  | 0.5            | 0.25 |

**Assignment/ Seminar/ Viva-Voce**

For each theory course, each student is required to submit an assignment or to present a seminar or to attend a viva-voce based on any topic related to the course concerned. Assignment/ seminar/viva-voce shall be evaluated on the basis of student's performance.

**Written Tests**

For each theory course there shall be a minimum of two written tests and the average mark of the two tests is to be considered for Internal Mark. Each test paper may have duration of minimum one hour.

*(If a fraction appears in internal marks, nearest whole number is to be taken).*

**External Evaluation (End Semester Evaluation - ESE)**

Details regarding the End Semester Evaluation of theory, practical and project courses are given below:

Theory Courses

Core Courses

- *Maximum Marks for each course* - *40 Marks*

- *Duration of examination* - 3 Hrs.
- Question Paper Pattern
  - Section A 4 questions (1 mark each) - 4 marks
  - Section B 7 questions out of 10 (2 marks each) - 14 marks
  - Section C 4 questions out of 6 (3 marks each) - 12 marks
  - Section D 2 questions out of 4 (5 marks each) - 10 marks

**For Research Methods and Techniques for Economic Analysis**

- *Maximum Marks for each course* - 30 Marks
- *Duration of examination* - 2 Hrs.
- Question Paper Pattern
  - Section A 3 questions (1 mark each) - 3 marks
  - Section B 5 questions out of 7 (2 marks each) - 10 marks
  - Section C 4 question out of 6 (3 marks) - 12 marks
  - Section D 1 question out of 2 (5 marks) - 5 marks

**Open Course**

- *Maximum Marks for each course* - 20 Marks
- *Duration of examination* - 2 Hrs.
- Question Paper Pattern
  - Section A 5 questions (1 mark each) - 5 marks
  - Section B 5 questions out of 7 (2 marks each) - 10 marks
  - Section C 1 question out of 2 (5 marks) - 5 marks

## Project Evaluation

| Internal (5 Marks)               |       | External(20 Marks)                                                   |       |
|----------------------------------|-------|----------------------------------------------------------------------|-------|
| Component                        | Marks | Component                                                            | Marks |
| Punctuality                      | 1     | Relevance of the topic,<br>quality of introduction<br>and conclusion | 5     |
| Use of Data                      | 1     | Methodology<br>Reference<br>Bibliography                             | 5     |
| Scheme/Organization of<br>Report | 1     | Presentation, Quality of<br>Analysis and Findings                    | 10    |
| Viva-Voce                        | 2     | Total                                                                | 20    |
| Total                            | 05    |                                                                      |       |

# ***MODEL QUESTION PAPERS***

# ***CORE COURSE***



**KANNUR UNIVERSITY**  
**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**MICRO ECONOMIC ANALYSIS-I (Core Course)**  
**SEMESTER I**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part A**

**(Answer All Questions. Each Carries One Mark)**

1. What is economic model?
2. State the Law of Demand.
3. Define utility.
4. What is meant by the degree of monopoly power? 1x4=4

**Part B**

**(Answer Any Seven Questions. Each Carries Two Marks)**

5. Distinguish between homogenous and non homogenous production function.
6. What is optimal expansion path?
7. What is Giffen paradox?
8. Distinguish between returns to a variable factor and returns to scale.
9. What is capital deepening technical progress?
10. Briefly explain the limitations of traditional theories of consumer choice.
11. Briefly explain the elasticity of supply.
12. State and explain the Slutsky's Law.
13. Explain the Price Ceilings and Price Floors.
14. What are the important uses of the price theory?

7x2=14

### **Part C**

**(Answer Any Four Questions. Each Carries Three Marks)**

15. Distinguish between cardinal and ordinal utility approaches to consumer behaviour.
16. Critically examine the Law of diminishing marginal utility.
17. Briefly explain the basic concepts of linear programming.
18. How does choice reveal preference according to Samuelson?
19. Explain the Hicksian version of splitting up of price effect into income effect and substitution effect.
20. Explain how Marshall resolved the Water-Diamond Paradox.

4x3=12

### **Part D**

**(Answer Any Two Questions. Each Carries Five Marks)**

21. Explain the equilibrium of single and multi product firms using Isoquants, Production Possibility Curves, and other relevant tools.
22. Explain the short run and long run cost curves in traditional and alternative approaches.
23. Explain changes in demand and changes in quantity demanded. Illustrate different types and methods of measurement of price elasticity of demand.
24. Explain the important applications of Hicksian Indifference curve analysis.

2x5=10

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ECONOMICS/DEVELOPMENT ECONOMICS  
MICRO ECONOMIC ANALYSIS-II (Core Course)  
SEMESTER II**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part A**

**(Answer All Questions. Each Carries One Mark)**

1. Define monopsony.
2. What is product differentiation?
3. What is 'great cost controversy'?
4. Define quasi rent.

**Part B**

**(Answer Any Seven Questions. Each Carries Two Marks)**

5. What is meant by Pareto Optimum?
6. Distinguish between accounting profit and economic profit.
7. Explain the functional and personal distribution of income.
8. Distinguish between marginal revenue product (MRP) and value of marginal product (VMP).
9. Define monopoly and explain the important factors responsible for its emergence.
10. Distinguish between optimal and suboptimal output.
11. 'Profit is a residual surplus.' Explain.
12. Explain monopolistic and monopsonistic exploitation.
13. Distinguish between collusive and non collusive oligopoly.
14. Distinguish between market wage and subsistence wage.

### **Part C**

**(Answer Any Four Questions. Each Carries Three Marks)**

15. Explain the indeterminacy of price and output under bilateral monopoly.
16. Explain the product exhaustion theorem.
17. Explain briefly the Cournot Model of duopoly.
18. Explain the necessary conditions and features of oligopoly.
19. Explain critically the small group model of Chamberlin.
20. How does entry/exit mechanism ensure tangency solution to all firms under perfect competition in the long run?

### **Part D**

**(Answer Any Two Questions. Each Carries Five Marks)**

21. Explain the oligopolistic interdependence, uncertainty and price stickiness with the help of Kinked demand Model.
22. Explain the large group model of Chamberlin.
23. Explain when price discrimination is possible and profitable. Explain the Discriminating Monopoly model.
24. Define social welfare and critically analyse the important criteria of social welfare.

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**ECONOMICS/DEVELOPMENT ECONOMICS**  
**MACRO ECONOMIC ANALYSIS-I (Core Course)**  
**SEMESTER III**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part A**

**(Answer All Questions. Each Carries One Mark)**

1. Define full employment.
2. State Keynes' Psychological Law of Consumption.
3. Define money illusion.
4. What is meant by liquidity trap?

**Part B**

**(Answer Any Seven Questions. Each Carries Two Marks)**

5. Distinguish between voluntary and involuntary unemployment.
6. How far volatile is the investment in Keynesian macroeconomic system?
7. Define macroeconomics and explain how far different it is from microeconomics.
8. Distinguish between balanced and unbalanced budgets and define the Haavelmo effect.
9. Why do people demand money according to Keynes?
10. Comment on the statement, 'Supply creates its own demand'.
11. Briefly explain the concepts of neutrality of money and classical dichotomy.
12. Briefly explain the Keynesian concept of secular decline in MEC.
13. How does Relative Income Hypothesis explain consumption behaviour of households?
14. Distinguish between autonomous and induced investments.

### **Part C**

**(Answer Any Four Questions. Each Carries Three Marks)**

15. Explain briefly the Keynesian multiplier. Calculate the value of investment multiplier when MPS is equal to 20%.
16. Briefly explain the circular flow of income and expenditure.
17. Explain the Keynesian and Classical interpretations of Saving Investment equality.
18. Explain the relation between investment and interest in Classical and Keynesian macroeconomic systems.
19. Distinguish between Keynesian and Classical interpretations of wage flexibility and labour market equilibrium.
20. Explain the relevance of Keynesian policies in the contemporary world of economic crisis.

### **Part D**

**(Answer Any Two Questions. Each Carries Five Marks)**

21. Explain the Permanent Income Hypothesis. Explain the important similarities and differences between Permanent Income Hypothesis and Lifecycle Hypothesis.
22. Explain the important assumptions and features of Classical theory of Full Employment. How do Classical economists justify the laissez faire policy?
23. Explain Keynesian underemployment equilibrium with the help of algebra and cross diagram. How does Keynes justify the interventionist policy?
24. Explain the various methods of national income estimation. Explain the important difficulties of national income estimation in India.

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**ECONOMICS/DEVELOPMENT ECONOMICS**  
**INTERNATIONAL ECONOMICS (Core Course)**  
**SEMESTER III**

**Time: 3 Hours**

**Maximum: 40 marks**

**Part – A**

**(Very short answer type Questions). Answer all Questions.**

1. What do you mean by BOP
2. What is invisible trade
3. Differentiate between international trade and inter-regional trade
4. What do you mean by free trade

**Part – B**

**(Short answer type Questions) Answer any SEVEN Questions**

5. What do you mean by non-tariff barriers
6. What are the merits of fixed exchange rate
7. Write a short note on balance of trade
8. Critically illustrate the impact of foreign direct investment in India since globalization
9. Illustrate different types of protection
10. Define dumping
11. What is reciprocal demand
12. Define terms of trade
13. Differentiate between current and capital account
14. What do you mean by protective tariff

**Part – C**

**(Short Essay type Questions) Answer any FOUR Questions**

15. Critically evaluate the purchasing power parity theory
16. Explain the comparative cost theory
17. Give a brief account of foreign portfolio investment
18. Examine the impact of tariffs
19. Discuss the role and functions of IMF
20. Explain the Mint Parity Theory of exchange rate determination

**Part – D**

**(Essay type Questions) Answer any TWO Questions**

21. Critically evaluate the Heckscher Ohlin trade theory
22. Critically examine the role of WTO in promoting the foreign trade of India
23. What do you mean by balance of payment disequilibrium. Give a brief account of the important causes of the BOP disequilibrium and the measures to correct the disequilibrium?
24. Describe the different concepts of terms of trade. What are the important factors which influence the terms of trade



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ECONOMICS/DEVELOPMENT ECONOMICS  
MACRO ECONOMIC ANALYSIS II (CORE COURSE)  
SEMESTER 1V**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part A**

**(Answer All Questions. Each Carries One Mark)**

1. Define inflation.
2. What is Phillips Curve?
3. Define trade cycle.
4. What is seigniorage?

**Part B**

**(Answer Any Seven Questions. Each Carries Two Marks)**

5. What is meant by crowd out?
6. Distinguish between deflation and disinflation.
7. Explain briefly the concept of money multiplier.
8. What is meant by the monetary base?
9. How does stagflation invalidate the U-I tradeoff?
10. Explain the role of animal spirit in Keynesian macroeconomic system.
11. Explain briefly the disinflation and the sacrifice ratio.
12. Explain the important limitations of the basic ISLM model.
13. Explain the various types of unemployment.
14. Distinguish between inside money and outside money.

### **Part C**

**(Answer Any Four Questions. Each Carries Three Marks)**

15. Distinguish between Inflationary gap and deflationary gap.
16. Explain the phases of trade cycles with the help of a graph.
17. Explain the monetarist interpretation of trade cycles.
18. Distinguish between short run and long run Phillips Curves.
19. Explain in a Keynesian perspective how fiscal policy can be used to cure depression and unemployment.
20. Explain liquidity trap with the help of LM curve.

### **Part D**

**(Answer Any Two Questions. Each Carries Five Marks)**

21. Explain the Transaction and Cash Balance approaches to the Quantity Theory of Money.
22. Explain Hawtrey's and Hayek's theories of trade cycle.
23. Explain inflation and its causes. How do economists classify inflation?
24. Derive IS and LM curves and explain the basic ISLM model.

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**ECONOMICS/DEVELOPMENT ECONOMICS**  
**ENVIRONMENTAL ECONOMICS (CORE COURSE)**  
**SEMESTER 1V**

**Time: 3 Hours**

**Max.Marks: 40**

**Part - A**

**(Answer all questions. Each question carries 1 mark)**

1. Define environmental economics.
2. Define ecology.
- 3 What is e-waste?
4. Define externality.

**Part - B**

**(Answer any seven questions. Each question carries 2 marks.)**

5. How is a biocentrism different from anthropocentrism?
6. Explain the relationship between environment and economics
7. Differentiate between weak sustainability and strong sustainability
8. What is the significance of 'tragedy of Commons' in environmental economics?
9. What is the difference between public good and public bad?
10. Explain sustainable development.
11. What is pigovian fee?
12. Explain Bhopal gas tragedy.
13. What is environmental subsidy?
14. Explain Coase theorem.

**Part - C**

**(Answer any four questions. Each question carries 3 marks.)**

15. Explain the material balance model.
16. Explain the effects of global warming.
17. Explain different economic instruments for environmental protection.

- 18 What are the causes for market failure in environmental economics?
19. What is the significance of World commission on sustainable development.
20. Differentiate between environmental economics, resource economics and ecological economics

**Part - D**

**(Answer any two questions. Each question carries 5 marks.)**

- 21 Explain briefly the different environmental problems faced by India, with a special reference to Kerala.
22. Explain different methods of valuation of the environment.
23. How can economic incentives help in improving the quality of environment?
24. Track the growth and development of environmental economics.

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ECONOMICS/DEVELOPMENT ECONOMICS  
BASIC TOOLS FOR ECONOMIC ANALYSIS-I (CORE COURSE)  
SEMESTER V**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part - A**

**(Answer all questions. Each question carries 1 mark.)**

1. Define logarithm of a number.
2. Define supply function.
3. Give the empirical relation between mean, median and mode.
4. What is meant by sample space?

**Part - B**

**(Answer any seven questions. Each question carries 2 marks.)**

5. What is the difference between frequency curves and frequency polygons?
6. Define dispersion. Which are the different measures of dispersion?
7. Solve  $2^{x+7} = 4^{x+2}$ .
8. Distinguish between arithmetic progression and geometric progression.
9. The demand for a commodity is  $D = 44 - 7p$ . The supply function is  $S = 2p - 10$ . Find  
(a) equilibrium price (b) the quantity exchanged in the market at this price.
10. Distinguish between mean deviation and standard deviation.
11. What are the uses of Lorenz curve?
12. Write notes on coefficient of variation.
13. Define mutually exclusive events with an example.
14. A cyclist pedals from his house to college at a speed of 8 km/h and back from the college to his house at 12 km/h. Find the average speed.

### Part - C

(Answer any four questions. Each question carries 3 marks.)

15. If the 7<sup>th</sup> and 12<sup>th</sup> terms of an A.P. are 20 and 35 respectively, find the series.
16. The demand and supply functions of two commodities A and B are  $D_A = 10 - 2P_A + P_B$ ,  
 $D_B = 20 + P_A - 5P_B$ ,  $S_A = 4P_A$ ,  $S_B = -1 + 6P_B$ .  
Find the equilibrium prices and quantities.
17. Evaluate using logarithm  $(431 \times 23.63)/(40.34 \times 21.25)$  .
18. Find median from the following frequency distribution
- |            |         |         |         |         |         |         |
|------------|---------|---------|---------|---------|---------|---------|
| Class:     | 15 – 25 | 25 - 35 | 35 - 45 | 45 - 55 | 55 - 65 | 65 - 75 |
| Frequency: | 4       | 11      | 19      | 14      | 0       | 2       |
19. Find the standard deviation and coefficient of variation of the values  
10, 12, 80, 70, 60, 100, 0 and 4.
20. Before ten years the age of a father was four times of his son. After ten years the age of the father will be twice that of his son. What are the ages of the father and the son?

### Part - D

(Answer any two questions. Each question carries 5 marks.)

21. Explain the different methods of sampling.
22. Solve the following system of equations
- $$x + 3y + z = 14$$
- $$x - y + 3z = 10$$
- $$2x + 4y - z = 10$$
23. Show that  $\log 2 + 16 \log (16/15) + 12 \log (25/24) + 7 \log (81/80) = 1$ .
24. Explain skewness and its absolute and relative measures

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ECONOMICS/DEVELOPMENT ECONOMICS  
ALTERNATIVE ECONOMICS (CORE COURSE)  
SEMESTER V**

**Time: Three Hours**

**Maximum marks: 40**

**Part – A**

**(Very short answer type Questions). Answer all Questions.**

- 1) Define ecological economics.
- 2) What is meant by 'Immiserization of the Proletariat'?
- 3) Explain Gender budgeting.
- 4) What is econometrics?

**Part – B**

**(Short answer type Questions) Answer any seven Questions**

- 5) Explain Marx' analysis of falling tendency of profit in capitalism.
- 6) Garry Becker's ideas on economics of gender?
- 7) Explain Herman Daly's steady state economics
- 8) Explain how Marx analyzed the capital accumulation and industrial reserve army.
- 9) Distinguish between rate of surplus value and rate of profit.
- 10) Relevance of behavioral economics.
- 11) Explain the term spaceship earth.
- 12) Define economics.
- 13) What is Concentration of capital? How it is different from Centralization of Capital?
- 14) Critically examine the problems of neo classical economics?

### **Part – C**

#### **(Short Essay type Questions) Answer any four Questions**

- 15) Bring out the difference between women in development approach and women and development approach?
- 16) 'Capitalism carries its own seeds of destruction' - critically evaluate the statement.
- 17) Explain the relationship between human housekeeping and nature`s housekeeping.
- 18) What is econo-physics?
- 19) Explain the contributions of Nancy folbre.
- 20) 'Marxism was grafted on Classical trunk' – explain.

### **Part – D**

#### **(Essay type Questions) Answer any two Questions**

- 21) What is the scope of gender budgeting? Write a note on evolution of gender budgeting in India?
- 22) Explain the relevance of Marxian Economics in the contemporary world.
- 23) Explain how sustainability is treated in ecological economics. How is it different from conventional Economics?
- 24) Critically examine the recent trends in economics?



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**ECONOMICS/DEVELOPMENT ECONOMICS**  
**RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS**  
**(CORE COURSE)**  
**SEMESTER V**

**Time: Two hours**

**Maximum marks: 30**

**Part – A**

**(Very short answer type Questions). Answer all Questions.**

1. What is deductive method?
2. Distinguish between positive and normative economics?
3. Define economics.

**Part – B**

**(Short answer type Questions) Answer any five Questions**

- 4) What is a hypothesis?
- 5) What is laissez- faire system?
- 6) What is plagiarism?
- 7) Write a note on institutional economics.
- 8) Discuss about different methods of research in economics?
- 9) Adam smith's concept of value
- 10) Distinguish between demand price and supply price?

**Part – C**

**(Short Essay type Questions) Answer any Four Questions**

- 15) What makes neoclassical theoretical system different from classical school?
- 16) Theory of invisible hand
- 17) What is the essence of Keynesian revolution?
- 18) Explain various steps involved in economic research?
- 19) Write a note on assumption controversy in economics?
- 20) What are the ethical practices in social science research?

**Part – D**

**(Essay type Questions) Answer any One Questions**

- 21) Define economics. Explain the nature and significance of economics as science?
- 22) Critically examine the methodological drawbacks of neo classical economics?

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**ECONOMICS**  
**DEVELOPMENT ECONOMICS (CORE COURSE)**  
**SEMESTER V**

**Time: Three hours**

**Maximum marks: 40**

**Part – A**

**(Very short answer type Questions). Answer all Questions.**

- 1) What is development economics?
- 2) Define HDI?
- 3) What do you mean by disguised unemployment?
- 4) What is poverty trap?

**Part – B**

**(Short answer type Questions) Answer any Seven Questions**

- 5) What is the significance of gender development index?
- 6) How agriculture is linked to other sectors of the economy?
- 7) Discuss about the concept of take off?
- 8) Define the term Solow residual?
- 9) Distinguish between natural growth rate and warranted growth rate?
- 10) What are the characteristic features of traditional society according to Rostow?
- 11) What is Lewisian turning point?
- 12) What is PQLI?
- 13) Distinguish between endogenous and exogenous growth models.
- 14) Problem of inequality in India.

**Part – C**

**(Short Essay type Questions) Answer any Four Questions**

- 15) Define unemployment. What are the types of unemployment?

- 16) Write short note on Growth and development?
- 17) Summarize the neo classical theory of growth by Solow?
- 18) Highlight the development indicators of India?
- 19) Bring out the interlinkages between inequality and development?
- 20) What is the essence of big push theory by Rosenstein-Rodan?

**Part – D**

**(Essay type Questions) Answer any Two Questions**

- 21) Critically evaluate Rostow's stage theory?
- 22) Explain the relevance of Nurksian balanced growth theory?
- 23) Analyse the contributions of Schumpeter to development economics in the light of innovation theory?
- 24) What are the main challenges to development? Explain the case of Indian economy?

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**DEVELOPMENT ECONOMICS**  
**ECONOMICS OF DEVELOPMENT AND PLANNING- I (CORE COURSE)**  
**SEMESTER V**

**Time: 3hours**

**Maximum marks: 40**

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. Define HDI
2. Define Dualism
3. What is surplus value?
4. Explain stationary state

**Part B**

**Answer any 7 questions (Each question carries 2 marks)**

5. Distinguish between economic growth and development
6. What is intermediate technology?
7. Explain the theory of demographic transition
8. Distinguish between backward linkages and forward linkages
9. What are the determinants of development?
10. What are the indicators of PQLI?
11. State demand side causes of vicious circle of poverty
12. What is capital -output ratio?
13. Explain the big push theory.

**Part C**

**Answer any 4 questions (Each question carries 3 marks)**

14. State Rostow's stages of growth
15. Explain Human Development Index. Compare recent trends in HDI in India and Kerala.
16. Explain the Unbalanced growth theory.
17. Explain Schumpeter's theory of economic development.
18. Discuss Leibenstein's Critical Minimum Effort Thesis
19. Explain advantages and disadvantages of inward looking and outward looking policies .

**Part D**

**Answer any 2 questions (Each question carries 5 marks)**

20. Discuss the role of foreign capital in economic development
21. Critically Examine Lewis labour surplus theory of development
22. Explain the structure and characteristics of a developing economy
23. Explain the major developments in the measurement of economic development with special emphasis on HDI

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 20104**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**ECONOMICS OF BANKING AND FINANCE (CORE COURSE)**  
**SEMESTER V**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part - A**

**(Answer all questions. Each question carries 1 mark.)**

1. What is the main function of SEBI?
2. What is a gilt edged security?
3. What is the function of New Issue market?
4. What is the main advantage of financial derivatives?

**Part - B**

**(Answer any seven questions. Each question carries 2 marks.)**

5. What is a call money market?
6. What is the difference between debit card and credit card?
7. What is a derivative?
8. What are the main objectives of Regional Rural Banks?
9. What is a commercial paper?
10. What is the difference between primary and secondary market?
11. Name the quantitative instruments of credit control used by RBI.
12. How is a banking institution different from a non banking financial institution?
13. Explain the components of Indian Money market.
14. Give two features that distinguish a bank from a NBFC

**Part - C**

**(Answer any four questions. Each question carries 3 marks.)**

15. What are the functions of a modern commercial bank?
16. Explain the functioning of a secondary market.
17. Differentiate between money market and capital market.
- 18 Explain the functions of NABARD
19. Explain the role of SEBI in regulating financial market.
20. What are the important functions of financial system?

**Part - D**

**(Answer any two questions. Each question carries 5 marks.)**

21. Critically examine the role of RBI in regulating Indian financial markets.
22. Explain the different components of Indian financial system.
23. Explain the functioning of stock markets in India
- 24 Illustrate the process of multiple expansions of bank deposits.

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**BASIC TOOLS FOR ECONOMIC ANALYSIS-II (CORE COURSE)**  
**SEMESTER VI**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part – A**

**(Answer all questions. Each question carries 1 mark.)**

1. Define identity matrix.
2. What is meant by limit of a function?
3. What is the relation between correlation and regression coefficients?
4. Define secular trend.

**Part – B**

**(Answer any seven questions. Each question carries 2 marks.)**

5. Given the matrices

$$A = \begin{bmatrix} 2 & 3 & 5 \\ 5 & 4 & 2 \\ 2 & 5 & 9 \end{bmatrix} \text{ and } B = \begin{bmatrix} 5 & -9 & 6 \\ 2 & 3 & -5 \\ 4 & -9 & 7 \end{bmatrix}.$$

Find (i)  $A + B$  and (ii)  $A - B$ .

6. Show that the matrix  $\begin{bmatrix} 5 & 7 & 2 \\ 2 & 3 & 1 \\ 4 & 6 & 2 \end{bmatrix}$  is singular.

7. Distinguish between minor and co-factor.

8. Find  $\frac{dy}{dx}$  if  $y = \frac{x+1}{x-1}$ .

9. Define price elasticity of demand.

10. Discuss about total derivatives.

11. Distinguish between correlation and regression.

12. Explain the principle of least squares.



13. Define Laspyers and Paasches index numbers.  
14. Define the components of a time series.

**Part - C**

**(Answer any four questions. Each question carries 3 marks.)**

15. If  $A = \begin{bmatrix} 2 & 3 & 1 \\ 0 & -1 & 5 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & 2 & -1 \\ 0 & -1 & 3 \end{bmatrix}$ , find  $2A-3B$ .

16. If  $y = x \log x$ , prove that  $x^2 \frac{d^2y}{dx^2} - x \frac{dy}{dx} + y = 0$ .

17. Explain marginal cost, marginal revenue and marginal productivity.  
18. Explain scatter diagram.  
19. Discuss about rank correlation.  
20. Prove that Fisher's ideal index number satisfies both time reversal and factor reversal tests.

**Part - D**

**(Answer any two questions. Each question carries 5 marks.)**

21. Solve the following system of equations using Cramer's rule.

$$5x - 6y + 4z = 15$$

$$7x + 4y - 3z = 19$$

$$2x + y + 6z = 46$$

22. A radio manufacturer produces  $x$  sets per week at a total cost of Rs.  $x^2 + 78x + 2500$ . The demand function is  $8x = 600 - p$  where  $p$  is the price per unit. When is the net revenue maximum? What is the price per set then?  
23. Discuss the various steps in the construction of index numbers.  
24. Explain the different methods for measuring trend.

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS**  
**CENTRAL THEMES IN INDIAN ECONOMY**  
**(CORE COURSE)**  
**SEMESTER VI**

**Time: Three hours**

**Maximum marks:40**

**Part – A**

**(Very short answer type Questions). Answer all Questions.**

- 1) What is new economic policy?
- 2) Green revolution
- 3) Problem of ageing.
- 4) Concept of poverty.

**Part – B**

**(Short answer type Questions) Answer any SEVEN Questions**

- 5) What do you mean by land reforms?
- 6) What are the key objectives of Indian planning?
- 7) Industrial sickness.
- 8) Write a note on public distribution system in Kerala.
- 9) Examine the role of cottage and small scale industries in the growth of Indian economy?
- 10) Explain the nature of cropping pattern in Kerala?
- 11) Trends in the pattern of exports from India since 1990's.
- 12) State the new economic policy of 1991?
- 13) What is demographic transition? .Explain different stages.
- 14) Explain the limitations of Indian economic planning.

**Part – C**

**(Short Essay type Questions) Answer any FOUR Questions**

- 15) Highlight Kerala's development in social sectors.

- 16) Explain the problems of capital formation in India
- 17) Structure of BOP behaviour in India.
- 18) Highlight the development indicators of India?
- 19). Examine the role of small scale industries in India.
- 20) Explain the problems of energy sector in Kerala.

### **Part – D**

#### **(Essay type Questions) Answer any TWO Questions**

- 21) How do you analyse the performance of education and health sector in India during post liberalisation era.
- 22) Critically examine the structure and composition of India's foreign trade?
- 23) Discuss the problems of capital formation in India.
- 24) Analyse the important objectives and strategies of planning in India.

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**DEVELOPMENT ECONOMICS**  
**ECONOMICS OF DEVELOPMENT AND PLANNING I (CORE COURSE)**  
**SEMESTER VI**

**Time: 3hours**

**Maximum Marks: 40**

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. Define economic planning
2. Explain the term labour intensive technique
3. What do you understand by rolling planning
4. Explain disguised unemployment

**Part B**

**Answer any 7 questions (Each question carries 2 marks)**

5. What is meant by sustainable development?
6. Explain the term financial planning
7. What do you mean by planning strategy
8. Explain economic controls
9. What do you understand by the term linear programming
10. Explain the concept of perspective planning
11. Role of shadow prices in economic planning
12. Explain the limitations of planning in India
13. Explain economic controls

**Part C**

**Answer any 4 questions (Each question carries 3 marks)**

14. Explain the concept of cost-benefit analysis
15. Explain some anti-poverty programmes implemented in India
16. Explain the concept of democratic planning
17. Explain advantages and disadvantages of capital intensive technology
18. Explain the objectives and strategies of 12<sup>th</sup> five year plan
19. Explain a short note on Earth Summit at Rio De Geneiro and Recent Developments.

**Part D**

**Answer any 2 questions (Each question carries 5 marks)**

20. Discuss the merits and demerits of major investment criteria .
21. Explain the salient features of planning in India and state its objectives and strategies.
22. Explain the problems and policies of sustainable development
23. Explain the features and limits to Kerala model of development

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**PUBLIC ECONOMICS (CORE COURSE)**  
**SEMESTER VI**

**Time: Three hours**

**Maximum marks: 40**

**Part – A**

**(Very short answer type Questions). Answer all Questions.**

- 1) Public good
- 2) Free riding
- 3) What is the difference between impact and incidence?
- 4) Define escheats.

**Part – B**

**(Short answer type Questions) Answer any SEVEN Questions**

- 5) Write a note on externalities.
- 6) What is zero based budgeting?
- 7) Explain the benefit theory of taxation?
- 8) What is merit good?
- 9) Distinguish between deficit budget and surplus budget?
- 10) Distinguish between specific and Ad valorem taxes?
- 11) Forfeitures
- 12) Distinguish between progressive and proportional taxation.
- 13) Define sinking fund.
- 14) Distinguish between tax rate and tax base?

**Part – C**

**(Short Essay type Questions) Answer any FOUR Questions**

- 15) Critically examine the theory of public choice?
- 16) Explain the concept of shifting of taxation?
- 17) State the canons of public expenditure.

- 18) Define deficit financing. What are the methods of deficit financing?
- 19) Distinguish between impact and incidence. Explain Musgrave's concept of incidence.
- 20) Explain wise men peacock hypothesis?

**Part – D**

**(Essay type Questions) Answer any TWO Questions**

- 21) Define public economics. Explain the scope and subject matter of public economics?
- 22) Explain the merits and demerits of direct and indirect taxes.
- 23) Define VAT. Explain the merits and demerits of VAT.
- 24) Critically examine the theory of maximum social advantage?

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**BASIC ECONOMETRIC ANALYSIS (CORE COURSE)**  
**SEMESTER VI**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part-A**

**(Answer all questions. Each question carries 1 mark)**

1. Define Econometrics.
2. What is BLUE?
3. Distinguish between Endogenous and Exogenous variables.
4. Distinguish between Population regression function and Sample regression function.

**Part-B**

**(Answer any seven questions. Each question carries 2 marks)**

5. What is the meaning of 'linear in parameters'?
6. Justify the use of random error term in a regression model.
7. Distinguish between time series data and cross section data.
8. Distinguish between statistical model and econometric model.
9. Define F ratio.
10. What is Heteroscedasticity?
11. What are the desirable properties of good econometric model?
12. What is the classic symptom of Multicollinearity?
13. How to find the presence of autocorrelation?
14. What are the important goals of Econometrics?

**Part-C**

**(Answer any four questions. Each question carries 3 marks)**

15. State the Stochastic assumptions of OLS.

16. Explain Coefficient of determination.
17. Explain Durbin-Watson test for Autocorrelation.
18. Explain any two methods to overcome the problem of Heteroscedasticity.
19. What is multiple linear regression model?
20. Distinguish between Single equation and Simultaneous equation models.

**Part-D**

**(Answer any two questions. Each question carries 5 marks)**

21. What is Econometrics? What are its scope and limitations?
22. Discuss the Methodology of Econometrics.
23. Explain in detail Gauss Markov theorem.
24. Explain the estimation procedure of Ordinary Least Squares method in Single linear regression model.



# ***COMPLEMENTARY COURSE***

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**MATHEMATICS FOR ECONOMIC ANALYSIS-I (COMPLEMENTARY COURSE)**  
**SEMESTER I**

**Time: 3 Hours**

**Max. Marks: 40**

**Part - A**

**(Answer all the 4 Questions. Each carries 1 Mark)**

1. If  $R = 9x - x^2$ , MR is -----
2. If  $D = 100 - 2p$ , demand for free good is -----
3. If  $z = x/y$ ,  $z/x$  is -----
4. Find the elasticity of demand for the demand function  $q = 27/p^3$

**Part - B**

**(Answer any 7 questions. Each carries 2 Marks)**

5. Define function.
6. Define continuity of a function at a point.
7. Derive the slope of function  $ax + by + c = 0$ .
8. Find the differential coefficient of  $xy + y^2 = 4$
9. Differentiate convex and concave function.
10. Differentiate partial and total derivatives.
11. Differentiate  $x^x$ .
12. Criterion for minimum value of a function.
13. Find  $d^2z$  if  $z = x + y$
14. Define the following :

- a) Single valued function
- b) Single variable function
- c) Increasing function
- d) Convex function

**Part – C**

**(Answer any 4 questions. Each carries 3 Marks)**

- 15. Explain briefly different types of functions.
- 16. Draw the graph of  $x^2 = 4y$ .
- 17. When do you say  $y = f(x)$  is continuous in the interval (a, b).
- 18. Differentiate  $a^x / x^2$  w.r.t x
- 19. If  $y = 3x^3 - 2x^2 + 6x$ , find  $d^4 y / dx^4$ .
- 20. Using L ‘Hospital’s rules evaluate  $\lim_{x \rightarrow 0} \frac{x^2 - 5x + 6}{x^2 - 4}$

**Part - D**

**(Answer any 2 questions. Each carries 5 Marks)**

- 21. Define elasticity. If the demand law is  $p = 20/q - 1$ , find elasticity of demand with respect to price at the point where  $q = 3$ .
- 22. For the production function  $16y^2 - y + 2(K - 4)^2 + 4(L - 5)^2 - 80 = 0$  find marginal productivities.
- 23. State Euler’s theorem and hence properties of homogenous functions.  
Verify Euler’s theorem for the following function  $u = 3x^2 + 2xy + y^2$
- 24. Explain the application of derivatives in economics.

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**MATHEMATICS FOR ECONOMIC ANALYSIS- I1 (COMPLEMENTARY COURSE)**  
**SEMESTER II**

**Time: 3 Hours**

**Max. Marks: 40**

**Part - A**

**(Answer all the 4 Questions. Each carries 1 Mark)**

1. If in a matrix, the number of rows is equal to the number of columns , then the matrix is called -----
2. Solve  $(x^3 + 1/x) dx$ .
3. If two rows or columns of a determinant are identical, the value of the determinant is -----  
--
4. A triangular matrix in which all the elements above the leading diagonal are zero is called a ---  
-----

**Part - B**

**(Answer any 7 questions. Each carries 2 Marks)**

5. Define Eigen value.
6. Differentiate consumer's surplus with producer's surplus.
7. What is the relationship between total and marginal values in economics?
8. Differentiate symmetric and skew symmetric matrix.
9. Mention any two properties of determinants.
10. What is the present value of a perpetual cash flow of Rs.1, 450 per year discounted at  $v = 5\%$ ?

11. Integrate  $e^x - 1/x$ .

12. Without calculation, can you say the value of  $\begin{pmatrix} 2 & 4 & 3 \\ 3 & 1 & 2 \\ 6 & 2 & 4 \end{pmatrix}$  Why?

13. Marginal Revenue function is given as  $100 - 8q$ . Calculate Total Revenue when  $q = 10$ .

14. If  $A = \begin{pmatrix} 3 & 4 \\ 1 & -2 \end{pmatrix}$ ,  $B = \begin{pmatrix} 5 & 2 \\ 0 & 1 \end{pmatrix}$  prove that  $AB \neq BA$

### Part - C

(Answer any 4 questions. Each carries 3 Marks)

15. Is it possible for a matrix to be its own inverse?

16. Integrate  $(x^2 \cdot e^x) dx$ .

17. Find the rank of A if  $A = \begin{pmatrix} 1 & 4 & 0 \\ 2 & 5 & 0 \\ 3 & 6 & 0 \end{pmatrix}$

18. Write the Lagrangian function for  $U = (x+2)(y+1)$  and  $P_x = 4$ ,  $P_y = 6$  and  $B = 130$  and find the optimal level of purchase  $x^*$  and  $y^*$ .

19. If Marginal Cost of a firm is given by  $MC = 3q^2 - 4q + 5$ , find out TC given that fixed cost is Rs. 100.

20. Evaluate  $\begin{pmatrix} 1 & 2 & 5 \\ 2 & 3 & 1 \\ -1 & 1 & 1 \end{pmatrix}$

**Part – D**

**(Answer any 2 questions. Each carries 5 Marks)**

21. Using Cramer's rule, solve:

$$4x + 3y - 2z = 1$$

$$x + 2y = 6$$

$$3x + z = 4$$

22. Explain the basic properties of definite Integrals.

23. Find the consumers surplus and producers surplus for the demand curve  $d(x)=16-x^2$  and supply curve

$$s(x)=4+x.$$

24. If  $MR=16-X^2$ . Find the maximum total revenue also find AR and demand function.

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**MATHEMATICAL ECONOMICS I (COMPLEMENTARY COURSE)**  
**SEMESTER -III**

**Time: 3 Hours**

**Max. Marks: 40**

**Part - A**

**(Answer all the 4 Questions. Each carries 1 Mark)**

**(Answer all the 4 Questions. Each carries 1 Mark)**

1. Marginal cost curve is the slope of -----
2. Elasticity of demand for the demand function  $q = 27/p^3$  is -----
3. If MR is 7 and elasticity of demand is 2 , then AR is -----
4. Second order derivative of Total Utility function is -----

**Part - B**

**(Answer any 7 questions. Each carries 2 Marks)**

5. Distinguish with Average Product and Marginal Product.
6. Find the elasticity of demand and MR, at  $P = 2$ , if the demand function  $q = 30 - 5p - p^2$ .
7. Distinguish between income effect and substitution effect.
8. What is cross elasticity of demand?
9. Write a note on short-run cost function.
10. Compute Total, Average and Average variable costs for the Marginal Cost function  $C' = 4 + 7x - 5x^2$  , if the total fixed cost is 40.
11. What is Giffen good?

12. Find elasticity of demand of the function  $x = 100 - 5p$  at  $p = 10$
13. Define MRTS.
14. Write a note on linear homogeneous production function.

### **Part - C**

**(Answer any 4 questions. Each carries 3 Marks)**

15. What combination of goods  $x$  and  $y$  should a firm produce to minimize cost when the joint cost function is  $C = 5x^2 - 10y^2 - xy + 39$  and the firm has a production quota of  $x + y = 34$ .
16. Given  $Q_1 = 100 - P_1 + 0.75P_2 - 0.25P_3 + 0.0075Y$ . At  $P_1 = 10$ ,  $P_2 = 40$ ,  $P_3 = 40$ , and  $Y = 10000$ , use cross elasticity to determine the relationship between good 1 and other two goods.
17. Find the firm's expansion path expressed in terms of its total expenditure, given its production function  $X = 8 \log L + 20 \log K$  and input prices  $P_L = 1$  and  $P_K = 5$ .
18. Write a note on Linear Expenditure System.
19. State and explain mathematically the properties of indifference curves.
20. Derive first and second order conditions for the profit maximization of a firm under perfect competition.
21. For a firm under perfect competition, the demand function is given as  $P = 100 - 0.01Q$  where  $Q$  is weekly production. The cost curve is given by  $C = 50Q + 30,000$ . Calculate equilibrium price and quantity.
22. Derive the expression for ordinary and compensated demand function.

### **Part - D**

**(Answer any 2 questions. Each carries 5 Marks)**

23. Derive Slutsky equation and interpret the results.
24. Explain the role of theory and mathematics in Economics.
25. Explain the properties of Cobb-Dauglas Production function.
26. How can we derive production function from cost function?



**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**MATHEMATICAL ECONOMICS II (COMPLEMENTARY COURSE)**  
**SEMESTER IV**

**Time: 3 Hours**

**Max. Marks: 40**

**Part – A**

**(Answer all the 4 Questions. Each carries 1 Mark)**

1. In linear programming, all of the solutions possible in the face of existing constraints are called -----
2. A primal LPP has 3 decision variables and 5 constraints. Its dual problem contains -----  
- -----
3. Input-output analyses assume----- returns to scale.
4. Participant of the game is called -----.

**Part – B**

**(Answer any 7 Questions. Each carries 2 Marks)**

5. State any three assumptions of linear programming.
6. What is a transaction matrix?
7. Explain closed input-output model.
8. Explain the terms objective function and feasible region.
9. Define primal and dual of a linear programming problem.
10. State any three limitations of input-output analysis.
11. How is input-output analysis related to the concept of general equilibrium?
12. Distinguish between pure strategy and mixed strategy.
13. Define saddle point.
14. What is two person zero sum game?

**Part - C**

**(Answer any 4 questions. Each carries 3 Marks)**

15. Solve graphically the following Linear Programming Problem:

$$\text{Minimise } Z = 5x_1 + 6x_2$$

$$\text{Subject to } 2x_1 + 5x_2 \leq 1500$$

$$3x_1 + x_2 \leq 1200$$

$$x_1, x_2 \geq 0$$

16. What are the uses of linear programming in economic analysis?
17. State the Hawkins-Simon conditions for viability of an input-output system.
18. Explain the various steps involved in solving an LPP through simplex method.
19. What is input-output analysis? What are its uses?
20. Solve the following game by the principle of dominance

$$\begin{pmatrix} 8 & 10 & 9 & 14 \\ 10 & 11 & 8 & 12 \\ 13 & 2 & 14 & 13 \end{pmatrix}$$

21. Explain how a game problem is solved by graphic method.

### Part - D

(Answer any 2 questions. Each carries 5 Marks)

22. The input coefficient matrix and final demand of a three sector economy given as :

$$A = \begin{pmatrix} 0.3 & 0.4 & 0.2 \\ 0.2 & 0 & 0.5 \\ 0.1 & 0.3 & 0.1 \end{pmatrix} \quad B = \begin{pmatrix} 10 \\ 20 \\ 30 \end{pmatrix}$$

Calculate output levels of the three sectors.

23. Solve the following Linear Programming Problem by simplex method:

$$\text{Maximise } Z = 3x_1 + 2x_2$$

$$\text{Subject to } x_1 + x_2 \leq 4$$

$$x_1 - x_2 \leq 4$$

$$x_1, x_2 \geq 0$$

24. Solve the following game problem graphically.

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**INTRODUCTORY ECONOMICS-I (COMPLEMENTARY COURSE)**  
**SEMESTER III**

**Time: Three hours**

**Maximum marks: 40**

**Part – A**

**(Very short answer type Questions). Answer all Questions.**

- 1) What is consumer's surplus?
- 2) Distinguish between cardinal and ordinal utility?
- 3) Concept of quasi rent.
- 4) What is selling cost?

**Part – B**

**(Short answer type Questions) Answer any SEVEN Questions**

- 5) What do you understand by imperfect competition?
- 6) Distinguish between price elasticity and cross elasticity of demand?
- 7) What is production possibility curve?
- 8) Define opportunity cost.
- 9) What do you mean by product differentiation?
- 10) Differentiate between expansion and contraction of demand.
- 11) What is social cost?
- 12) What is monopoly?
- 13) Distinguish between fixed cost and variable cost.
- 14) Define land. Discuss about its salient features.

**Part – C**

**(Short Essay type Questions) Answer any FOUR Questions**

- 15) What are the properties of an indifference curve?

- 16) Discuss about the functions and limitations of price mechanism?
- 17) Define elasticity of demand .what are the different degrees of elasticity of demand?
- 18) State the law of demand. What are its exceptions?
- 19) Define labour. What are features of labour?
- 20) Write a note on definitions of economics.

### **Part – D**

#### **(Essay type Questions) Answer any TWO Questions**

- 21) Critically examine marginal productivity theory of distribution?
- 22) How price and output is determined under perfect completion in the long run?
- 23) Define indifference curve. Discuss about the consumers equilibrium position under indifference curve analysis.
- 24) What is production? Explain the short run and long run laws of production?

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**INTRODUCTORY ECONOMICS-II (COMPLEMENTARY COURSE)**  
**SEMESTER III**

**Time: Three hours**

**Maximum marks:40**

**Part - A**

**(Very short answer type Questions). Answer all Questions.**

- 1) Distinguish between repo rate and reverse repo rate?
- 2) Define escheats.
- 3) What is sinking fund?
- 4) Define money.

**Part – B**

**(Short answer type Questions) Answer any SEVEN Questions**

- 5) What are the functions of a commercial bank?
- 6) Distinguish between inflation and deflation.
- 7) Define poverty. Distinguish between absolute poverty and relative poverty.
- 8) What are non tax revenue items?
- 9) Explain the difference between depreciation and devaluation?
- 10) What is moral suasion?
- 11) Define international trade. What the characteristic features of international trade.
- 12) What is disguised unemployment?
- 13) Distinguish between surplus budget and deficit budget?
- 14) Define money. What are the functions of money?

**Part – C**

**(Short Essay type Questions) Answer any FOUR Questions**

- 15) What are the measures taken to correct disequilibrium in the balance of payments in India?

- 16) Explain the principles of budgeting.
- 17) What do you mean by inequality? Discuss about different types of inequality in India.
- 18) What is inflation? Discuss about different types of inflation.
- 19) Distinguish between balance of trade and balance of payments.
- 20) Explain the methods of debt redemption.

### **Part – D**

#### **(Essay type Questions) Answer any TWO Questions**

- 21) Explain the concepts of national income. What are the limitations in estimating national income?
- 22) Distinguish between direct and indirect tax. Explain the merits and demerits of direct and indirect taxes in India.
- 23) Describe the functions of RBI. Explain the qualitative and quantitative credit control methods of RBI?
- 24) What is black money? Examine the causes and measures taken by government of India to tackle the issue.

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**HISTORY OF ECONOMIC THOUGHT-I (COMPLEMENTARY COURSE)**  
**SEMESTER III**

**Time:3 hours**

**Maximum marks: 40**

**Part A**

**Answer all questions (Each question carries 1 mark)**

24. What is Scholasticism?
25. Explain the concept 'Jubilee year'
26. What is Hedonism?
27. Explain the idea of 'Just price'

**Part B**

**Answer any 7 questions (Each question carries 2 marks)**

28. Say's Law of Markets
29. Net Product
30. Theory of Market Glut
31. Labour Theory of value
32. Utopian Socialism
33. Theory of Comparative Cost Advantage
34. Naturalism and Optimism
35. Imperialism
36. Adam Smith's canons of taxation

**Part C**

**Answer any 4 questions (Each question carries 3 marks)**

37. Compare the ideas of Mercantilism and Physiocracy
38. Explain the contributions of St Thomas Aquinas to Economic thought
39. Explain the Classical Theory of Economic Development
40. What are the factors responsible for the rise of Mercantilism?

41. Explain the features of State Socialism
42. What do you mean by Democratic Socialism?

**Part D**

**Answer any 2 questions (Each question carries 5 marks)**

43. Evaluate the contribution of Ancient thinkers to Economic Thought
44. Explain the contributions of Adam Smith to Economic Thought
45. Give a brief account of Marxian ideas
46. Critically explain Ricardian Theory of Rent



**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**HISTORY OF ECONOMIC THOUGHT-II (COMPLEMENTARY COURSE)**  
**SEMESTER IV**

**Time:3 hours**

**Maximum marks:40**

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. Gossen's first Law
2. Explain Gandhian idea of 'Village Sarvodaya'
3. Institutionalism
4. Multiplier

**Part B**

**Answer any 7 questions (Each question carries 2 marks)**

5. Agio Theory of Interest
6. The Representative Firm
7. The 'Drain Theory'
8. Doctrine of Trusteeship
9. Quasi-rent
10. Ranade's ideas on the role of the state
11. Consumer's surplus
12. Fisher's Equation of Exchange
13. What are the features of Ancient Indian Economic Thought

**Part C**

**Answer any 4 questions (Each question carries 3 marks)**

14. Give a brief account of the contributions of Subjective School to Economic Thought
15. Explain the contributions of Wicksell and Wicksteed to Economic thought
16. Explain the Keynesian Theory of Employment
17. State the contributions of AmartyaSen
18. Explain the features of Marginalist School
19. Briefly explain the contributions of Walras

**Part D**

**Answer any 2 questions (Each question carries 5 marks)**

20. Explain the contributions of Alfred Marshall to Economic Thought
21. Evaluate the salient features of Gandhian Economic Thought
22. Give a brief account of the contributions of Naoroji to Economic Thought
23. Assess the contributions of Keynes to the development of Modern Economic Thought

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**POPULATION STUDIES (COMPLEMENTARY COURSE)**  
**SEMESTER I**

**Time:3hours**

**Maximum marks: 40**

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. Define Demography
2. Sex Ratio
3. Crude Birth Rate
4. Census

**Part-B**

**Answer any 7 questions (Each question carries 2 marks)**

5. What are the main characteristics of population?
6. What are the important sources of population data?
7. Explain Optimum population
8. Infant Mortality Rate
9. Define Urbanization
10. Explain differential migration
11. Population pyramid
12. Explain the problem of ageing in the context of Kerala
13. Distinguish between positive checks and preventive checks
14. State the components of population change

**Part C**

**Answer any 4 questions (Each question carries 3 marks)**

15. Explain the subject matter of Population Study
16. Compare the demographic features of Kerala and India
17. Explain the National Population Policy of India
18. Explain Evert Lee's Theory of Migration
19. What are the different methods of population projection?
20. Explain the different demographic stages in development

## **Part D**

**Answer any 2 questions (Each question carries 5 marks)**

21. Explain the interrelationship between population and economic development
22. What are the causes and consequences of urbanization
23. Critically explain the Malthusian Theory of population
24. Explain five different measures of fertility

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**REGIONAL ECONOMICS (COMPLEMENTARY COURSE)**  
**SEMESTER II**

**Time: Three hours**

**Maximum marks: 40**

**Part – A**

**(Very short answer type Questions). Answer all Questions.**

- 1) What is urban bias?
- 2) Define backward area?
- 3) What is the meaning of regional imbalance?
- 4) Define “sectoral growth”?

**Part – B**

**(Short answer type Questions) Answer any SEVEN Questions**

- 5) Explain the indicators of regional economic development?
- 6) How industrial developments tackle the problem of economic backwardness?
- 7) What is the meaning of innovation?
- 8) What are the different stages of economic growth in the stage theory?
- 9) Explain the features of location theories?
- 10) Explain the problems of backward regions in India?
- 11) Define regional disparities in the Kerala context?
- 12) State the regional economic advantages of Kerala compared to other states?
- 13) What do you mean by planning for regional development?
- 14) What are the achievements of eleventh five year plan in India to solve the problem of regional imbalances?

**Part – C**

**(Short Essay type Questions) Answer any FOUR Questions**

- 15) Briefly explain the features of different types of regions in India?

- 16) Explain how regional economics is related to other subjects?
- 17) Prepare a note on Weber's theory?
- 18) Explain the inter-state variation of poverty in India in the last two decades?
- 19) What is "income disparity"? Is it relevant in the Kerala economy?
- 20) Explain the important arguments of Kuznets in the sector theory?

### **Part – D**

#### **(Essay type Questions) Answer any TWO Questions**

- 21) Briefly explain the objectives, nature, scope and importance of regional economics?
- 22) What do you mean by cumulative causation? Explain the different views on it by Myrdal and Hirschman?
- 23) Make a comparative inter-state analysis of the industrial and agricultural development of India in the last five decades?
- 24) Briefly explain the measures taken by Kerala for regional development in the last five decades?

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**AGRICULTURAL ECONOMICS (COMPLEMENTARY COURSE)**  
**Semester III**

**Time: Three hours**

**Maximum marks: 40**

**Part – A**

**(Very short answer type Questions). Answer all Questions.**

- 1) What is crop diversification?
- 2) Define crop insurance?
- 3) What is the meaning of biotechnology?
- 4) Define “land reform”?

**Part – B**

**(Short answer type Questions) Answer any SEVEN Questions**

- 5) Explain the importance of agriculture in economic development?
- 6) How agriculture is linked to other sectors of the economy?
- 7) What is the meaning of green revolution?
- 8) What are the problems of agricultural marketing in India?
- 9) Explain the role of informatics in the Indian agriculture?
- 10) Explain the nature of cropping pattern in Kerala?
- 11) Define farm management in the Kerala context?
- 12) State the new economic policy of 1991?
- 13) What do you mean by organic farming?
- 14) What are the achievements of eleventh five year plan in Indian agriculture?

**Part – C**

**(Short Essay type Questions) Answer any FOUR Questions**

- 15) Briefly explain the problems of agricultural finance in India?
- 16) Explain the production function in agriculture?
- 17) Prepare a note on agricultural extension?

- 18) Explain the nature and importance of technology in Indian agriculture?
- 19) What is “self help groups”? Is it relevant in the Kerala agriculture?
- 20) Explain the arguments against land reforms in Kerala?

**Part – D**

**(Essay type Questions) Answer any TWO Questions**

- 21) Briefly explain the nature, scope and importance of agricultural economics?
- 22) What do you mean by sustainable agriculture? Explain the challenges of agricultural sustainability in India?
- 23) What is agricultural finance? Explain the salient features of the structure of agricultural finance in India?
- 24) Briefly explain the performance of Kerala agriculture in the last five decades?

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**GENDER ECONOMICS (COMPLEMENTARY COURSE)**  
**Semester IV**

Time: 3hours

Maximum Marks: 40

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. Explain fertility rate
2. Explain the GEM
3. Define Gender Equity
4. Explain gender role

**Part B**

**Answer any 7 questions (Each question carries 2 marks)**

5. Distinguish between Gender and Sex
6. Define femininity and masculinity
7. Explain work participation rate.
8. What do you mean by gender discrimination?
9. Explain gender stratification
10. Explain ICDS
11. Explain the misuse of sex determination technology.
12. Explain why dowry system is prohibited by law?
13. What is gender sensitive budget ?
14. "Gender is not static or immutable"-explain.
15. Explain GDI

**Part C**

**Answer any 4 questions (Each question carries 3 marks)**

16. Explain feminization of agriculture.
17. Evaluate the role of SEWA in women empowerment.
18. Explain some major determinants of women's wage.
19. Discuss the impact of technology and modernization on women workers.
20. Explain the phenomenon of falling GER of girls in India.
21. Discuss various schemes to develop and empower women entrepreneurs in India

**Part D**

**Answer any 2 questions (Each question carries 5 marks)**

22. Do you think that the participation of women in the work force will bring changes in their status? Substantiate your answer with reference to Indian conditions.
23. Examine the health status of women in India and Governmental measures to improve it.
24. Explain the effects of globalization and liberalization on women well being in developing countries.
25. Explain the role of N.G.Os and self help groups to empower women.



# ***OPEN COURSE***

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**ECONOMICS OF TRAVEL AND TOURISM (OPEN COURSE)**  
**SEMESTER-V**

**Time: Two hours**

**Maximum marks: 20**

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. What is meant Tourism multiplier
2. Define eco-tourism
3. What do you mean by a tourism product

**Part B**

**Answer any 3 questions (Each question carries 2 marks)**

4. Distinguish between Tourist and Excursionist
5. Write a brief note on the functions of KTDC
6. Write a note on 'Travel Motivations'
7. Distinguish between inbound and outbound tourism
8. Explain the aims of World Tourism Organisation

**Part C**

**Answer any 2 questions (Each question carries 3 marks)**

9. Discuss the functions of Tour Operators
10. Discuss the key elements in tourism planning
11. Explain the various forms of tourism
12. Bring out the specific features of tourism marketing

**Part D**

**Answer any 1 question (Each question carries 5 marks)**

13. Discuss the economic and environmental impact of tourism development
14. Discuss the important eco-tourism centers in Kerala and their specialties.

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2014**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**KERALA ECONOMY (OPEN COURSE)**  
**SEMESTER-V**

**Time: Two hours**

**Maximum marks: 20**

**Part – A**

**Very short answer type Questions). Answer all Questions.**

- 1) What is demographic transition?
- 2) What is empowerment?
- 3) Define migration.

**Part – B**

**(Short answer type Questions) Answer any Three Questions**

- 4) What is the nature and extent of unemployment in Kerala?
- 5) Explain the nature of cropping pattern in Kerala?
- 6) Write a note on traditional industries in Kerala.
- 7) What do you meant by privatisation? Is privatisation of service sectors an appropriate policy decision?
- 8) Issue of population ageing in Kerala?

**Part – C**

**(Short Essay type Questions) Answer any two Questions**

- 9) Is there energy crisis in Kerala?
- 10) Discuss about the implications of demographic transition in Kerala?
- 11) What do you understand by “Kerala model of development”?
- 12) How effective is the public distribution system in Kerala

**Part – D**

**(Essay type Questions) Answer any one Question**

- 13) Define decentralisation. Discuss about the impact of decentralisation policy on service sector?
- 14) Define globalisation. Explain the impact of globalisation on Kerala economy.

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**ECONOMICS OF SHARE MARKET (OPEN COURSE)**  
**SEMESTER-V**

**Time: 2 hours**

**Maximum marks: 20**

**PART A**

**Answer all questions (Each question carries 1 mark)**

1. Define 'Bull'.
2. What do you mean by Right issue?
3. What is investment?

**PART B**

**Answer any 3 questions (Each question carries 2 marks)**

4. What is money market? What are its characteristics?
5. Distinguish between Money market and capital market.
6. What is book building?
7. Distinguish between primary and secondary markets.
8. State the objectives of NSE.

**PART C**

**Answer any 2 questions (Each question carries 3 marks)**

9. Write a note on Operators in Primary market.
10. Briefly explain Risk and its types.
11. Write Discount and Finance House of India.
12. What are the types of Capital market?

**PART D**

**Answer any 1 question (Each question carries 5 marks)**

13. Explain various Money market instruments.
14. What are the important functions of Primary market?



KANNUR UNIVERSITY

M.Com. Programme under Credit Based Semester System in affiliated Colleges- Revised Scheme, Syllabus & Model Question Papers- Implemented with effect from 2014 admission- Orders issued.

ACADEMIC BRANCH

U.O.No.Acad/C1/6898 /2014

Dated, Civil Station, P.O. 8-7-2014

- Read: 1. U.O.No.Acad C1/11460/2013 dated 12-03-2014.  
2. Minutes of the meeting of the Board of Studies in Commerce (PG) held on 10-12-2013  
3. Minutes of the meeting of the Faculty of Commerce and Management Studies held on 28-03-2014  
4. Letter dated 3-06-2014 from the Chairman, Board of Studies in Commerce (PG)

ORDER

1. As per the paper read (1) above, the Revised Regulations for P.G. Programmes under Credit Based Semester System (CBSS) have been implemented in this University w.e.f.2014 admission.
2. The Board of Studies in Commerce PG vide paper read (2) above, finalized the Scheme Syllabus and Model Question Papers for M.Com Programme under Credit Based Semester System with effect from 2014 admission.
3. As per the paper read (3) above the meeting of Faculty of Commerce and Management Studies approved the Scheme, Syllabus and Model question papers for M.Com Programme w.e.f.2014 admission.
4. The Chairman, Board of Studies in Commerce (PG) as per letter cited (4) has forwarded the Scheme, Syllabus and Model Question Papers for M.Com. Programme for implementation with effect from 2014 admission.
5. The Vice Chancellor after considering the matter in detail and in exercise of the powers of Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement Scheme, Syllabus and Model Question Papers for M.Com Programmes under Credit Based Semester System (CBSS) with effect from 2014 admission subject to report Academic Council.
6. Orders are, therefore, issued accordingly.
7. The Implemented Scheme, Syllabus and Model Question Papers are appended.

Sd/-

DEPUTY REGISTRAR(Academic)  
FOR REGISTRAR

To

The Principals of Colleges offering M.Com Programme

(PTO)

Copy To:

1. The Examination Branch (through PA to CE)
2. PS to VC
3. PA to Registrar
4. PA to CE
5. PA to EO
6. DR (Acad)
7. AR I (Acad)
8. Chairman, BOS in <sup>Commerce</sup> ~~History~~ (PG)
9. SF/DE/FC



Approved for Issue

  
Section Officer

\*For more details; log on [www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in)

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# **KANNUR UNIVERSITY**

**U.O.No.Acad/C1/6898/2014 Dated, 8-07-2014**

SYLLABUS FOR THE POST GRADUATE DEGREE PROGRAMME IN COMMERCE  
(M.Com) UNDER CREDIT BASED SEMESTER SYSTEM (CBSS-PG) FOR  
AFFILIATED COLLEGES IMPLEMENTED WITH EFFECT  
FROM 2014-15 ACADEMIC YEAR

**Submitted to  
THE KANNUR UNIVERSITY**

## **PG BOARD OF STUDIES COMMERCE**

## **COURSES FOR M.COM**

| Semester                   | Course Code | Title                                        | Marks    |          |             | Credit    |
|----------------------------|-------------|----------------------------------------------|----------|----------|-------------|-----------|
|                            |             |                                              | Internal | External | Total       |           |
| I                          | COM1C01     | Business Environment & Policy                | 15       | 60       | 75          | 4         |
|                            | COM1C02     | Quantitative Techniques & Operation Research | 15       | 60       | 75          | 4         |
|                            | COM1C03     | Management Information System                | 15       | 60       | 75          | 4         |
|                            | COM1C04     | Organizational Behaviour                     | 15       | 60       | 75          | 4         |
|                            | COM1C05     | Accounting for Business Decisions            | 15       | 60       | 75          | 4         |
|                            | Total       |                                              | 75       | 300      | 375         | 20        |
| II                         | COM2C06     | Strategic Management                         | 15       | 60       | 75          | 4         |
|                            | COM2C07     | Research Methodology & Computer Application  | 15       | 60       | 75          | 4         |
|                            | COM2C08     | Costing for Management Decisions             | 15       | 60       | 75          | 4         |
|                            | COM2C09     | Advanced Business Accounting                 | 15       | 60       | 75          | 4         |
|                            | COM2C10     | Financial Management                         | 15       | 60       | 75          | 4         |
|                            | Total       |                                              | 75       | 300      | 375         | 20        |
| III                        | COM3C11     | Marketing Management                         | 15       | 60       | 75          | 4         |
|                            | COM3C12     | Corporate Accounting                         | 15       | 60       | 75          | 4         |
|                            | COM3C13     | Income Tax Law & Practice                    | 15       | 60       | 75          | 4         |
|                            | COM3C14     | Wealth Tax & Indirect Taxes                  | 15       | 60       | 75          | 4         |
|                            | COM3C15     | Human Resource Management                    | 15       | 60       | 75          | 4         |
|                            | Total       |                                              | 75       | 300      | 375         | 20        |
| <b>Elective A. Finance</b> | COM4E01     | Security Analysis & Portfolio Management     | 15       | 60       | 75          | 4         |
| IV                         | COM4E02     | International Financial Management           | 15       | 60       | 75          | 4         |
|                            | COM4E03     | Financial Markets & Services                 | 15       | 60       | 75          | 4         |
|                            | COM4E04     | Corporate Tax Planning & Management          | 15       | 60       | 75          | 4         |
|                            | COM4Pr      | Project Report/Dissertation                  |          |          | 25          | 2         |
|                            | COM4C16     | Viva-Voce                                    |          |          | 50          | 2         |
|                            | Total       |                                              | 60       | 240      | 375         | 20        |
| <b>Grand Total</b>         |             |                                              |          |          | <b>1500</b> | <b>80</b> |

(Continued in Page-2)



|                                  |         |                                   |    |    |    |   |
|----------------------------------|---------|-----------------------------------|----|----|----|---|
| <b>Elective B.<br/>Marketing</b> | COM4E05 | Consumer Behavior                 | 15 | 60 | 75 | 4 |
| IV                               | COM4E06 | Advertising & Sales<br>Management | 15 | 60 | 75 | 4 |
|                                  | COM4E07 | Services Marketing                | 15 | 60 | 75 | 4 |
|                                  | COM4E08 | Logistics Management              | 15 | 60 | 75 | 4 |

|                                                   |         |                                       |    |    |    |   |
|---------------------------------------------------|---------|---------------------------------------|----|----|----|---|
| <b>Elective C.<br/>International<br/>Business</b> | COM4E09 | International Business<br>Environment | 15 | 60 | 75 | 4 |
| IV                                                | COM4E10 | Foreign Trade Management              | 15 | 60 | 75 | 4 |
|                                                   | COM4E11 | International Banking                 | 15 | 60 | 75 | 4 |
|                                                   | COM4E12 | International Marketing               | 15 | 60 | 75 | 4 |

**KANNUR UNIVERSITY**

**COM1C01 BUSINESS ENVIRONMENT AND POLICY**

**90 Hours**

**Credit 04**

**Course Objectives:**

1. To give the students an exposure to environmental dynamics of contemporary business.
2. To develop the skill of decision making by analyzing the business environment and opportunities.

**Module I**

**Business Environment**

Dynamics of Business and its Environment-Structure of Business environment-Types of Environment-Internal Environment -External Environment: Micro and Macro Environment - Changing Dimensions of Business Environment -Environmental Analysis – Benefits and Limitations.

(20 hours)

**Module II**

**Economic Environment**

Significance and constituents of Economic environment -Economic Systems and Business -Industrial Policies -Current Industrial Policy -Fiscal Policy Monetary Policy –Foreign Trade Policy -Disinvestment Business Implications –Economic Reforms- Liberalization and Structural Adjustment Programmes -Foreign Direct Investment: Types, Pros & Cons and trends in FDI Government Policy.

(20 hours)

**Module III**

**Regulatory Environment**

Elements of the Regulatory Environment - Regulatory Role of the Government -Forms of Regulation -Business Government Interface -Changing Dimensions of Legal Environment in India: IDRA, MRTP Act, FEMA, FT (D&R) Act, Competition Act, and SEBI. Guidelines for Technology Transfer.

(15 hours)

**Module IV**

**Socio-Cultural Environment**

Critical elements of Socio Cultural Environment: Social Institutions and Systems- Culture and its influence- Unemployment and Man Power Planning -Emerging Rural Sector in India -Social Responsibility of Business- Social Audit –Relevance of Business Ethics and Corporate Governance

(15 hours)

**Module V**

**Global Environment**

Meaning and Nature of Globalization -Impacts –Multi National Corporations -Foreign Collaborations and Indian Business- Non-Resident Indians and Corporate Sector –Global Institutional Framework for Business- GATT/WTO: TRIMS, Agreements on Agriculture and on Textiles and Clothing.

(10 hours)

**Practice Hours**

(10 hours)

**Total Hours**

**(90 hours)**

**BOOKS FOR REFERENCE:**

1. Dr. Vivek Mittal: Business Environment; Text & Cases- Excel Books, New Delhi
2. Maheswari and Gupta, A.N. Business, Government and Society.
3. Aswathappa, K. Essentials of Business Environment, Himalaya Publishing House, Mumbai.
4. Francis Cherunilam: Business Environment and Policy.
5. Kohli, S. L and Reruthra, N.K. Business Environment
6. Misra & Puri: Business Environment
7. K. Chidambaram: Business Environment

**KANNUR UNIVERSITY**

**COM1C02 QUANTITATIVE TECHNIQUES AND OPERATION RESEARCH**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

1. To make the students understand some of the basics of quantitative techniques
2. To equip the students to apply operation research techniques for decision making.

**COURSE INPUTS:**

**Module I.**

Probability -Meaning and definition -Basic concepts -Addition Theorem and Multiplication Theorem -Bayes' Theorem (Applications Only)

Contact Hours-15

**Module II.**

Probability Distributions -Introduction -Random variable -Uses of Expected value in decision making, Binomial Distribution -Poisson Distribution -Normal Distribution.

Contact Hours-15

**Module III.**

Testing of Hypothesis -Introduction -Concepts basic to Hypothesis testing procedure Hypothesis testing for Mean -Difference between means -Hypothesis testing for Proportion Difference between Proportions -Z test-T test -F test.

Contact Hours-10

**Module IV.**

Operation Research (OR) -Introduction -Uses -Tools in OR -Modeling in OR -Limitations of OR.

Contact Hours-10

**Module V.**

Linear Programming- Basic concepts- uses and applications- Graphic method of solution to the LPP

Contact Hours-10

**Module VI.**

Network analysis -PERT and CPM -Basic concepts -Construction of Network Diagram Calculation of Critical Path -Float -Slacks - (Avoid Crashing of activities and Resource allocation)

Contact Hours-20

**Practice Hours**

**10 Hours**

**Total Hours**

**90**

**BOOKS FOR REFERENCE:**

1. Richard I. Levin, David S. Rubin: Statistics for Management.
2. S. P. Gupta : Statistical Methods.
3. Sharma K. R : Quantitative Techniques and Operation Research.
4. Anand Sharma : Quantitative Techniques for Decision Making.
5. S. D. Sharma: Operation Research.
6. Philip Rajashekar: Operation Research.
7. Kanti Swarup, Gupta R. K. and Manmohan: Operation Research and Statistical Analysis.
8. C.R. Kothari : Quantitative Techniques
9. S. Kalavathy: Operations Research

**KANNUR UNIVERSITY**

**COM1C03 MANAGEMENT INFORMATION SYSTEM**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

To provide a basis understanding of the concept of Management Information System, its application in managerial decision making and the process of development and maintenance of information system in an organization.

**Module I.**

Introduction -Meaning and nature -Elements -Evolution -Functions -Relation with other disciplines -Information Technology and MIS. (10 hours)

**Module II.**

Concept of Information -Definition -Types -Mathematical definition -Entropy -Redundancy Data Reduction Techniques -Age, Quality and Value of Information -Application of Information concepts to MIS design. (12 hours)

**Module III.**

System concepts -Definition -Characteristics -General model of system -Types of systems Simplification -Decoupling -Control in systems -Positive and negative feedbacks -Law of requisite variety -Input, Process and Output controls -System concepts applied to MIS design. (13 hours)

**Module IV.**

Structure of MIS-Multiple approaches to the structure of MIS-Operating elements-Physical components -processing functions -output for users -MIS structure based on the level of management activity -Decision support -Organisational functions -Formal and Informal -Public and Private synthesis of MIS structure. (15 hours)

**Module V.**

Systems analysis and Design -Development and Implementation -System Development Life Cycle -Prototyping and User development approach. (15 hours)

**Module VI.**

Data Communication and Networking -Uses and types of Networks -LAN -WAN -MAN Topologies -E-mail -Teleconferencing -Internet Protocols -World Wide Web. Latest Trends in Information Technology (15 hours)

**Practice Hours**

(10 hours)

**Total Hours**

**(90 hours)**

**BOOKS FOR REFERENCE:**

1. Gordon B. Davis : Management Information System : Prentice Hall of India, Delhi.
2. Sadagopan S. : Management Information System : Prentice Hall of India, Delhi.
3. O'Brien James : Management Information System : Tata-McGraw Hill, New Delhi.
4. Murdick, Ross and Clagget : Information System for Modern Management : Prentice Hall, New Delhi.
5. Rajaraman V. : Analysis and Design of Information Systems : Prentice Hall, Delhi.
6. Simkin M.G. : Introduction to Computer Information System for Business : S. Chand & Company, New Delhi.
7. Dr. P. Mohan : Management Information System : Himalaya Publishing House, Delhi.
8. George M. Scott : Management Information System : Tata-McGraw Hill, New Delhi.
9. Effy Oz : Management Information System : Vikas Publishing House, New Delhi.
10. Sern James A : Analysis and Design of Information Systems : McGraw Hills, New York.

**KANNUR UNIVERSITY**

**COM1C04 ORGANISATIONAL BEHAVIOUR**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:** The objectives of the course are to help the students.

1. To understand the conceptual framework of management and organizational behaviour.
2. To understand the applicability of the concept.

**Module I.**

**Organizational Behaviour**

Concept and significance, relationship between management and organizational behaviour, emergence and ethical perspective, attitudes, perception -learning -personality, Learning theories- classical conditioning- operant conditioning- Cognitive- social learning- Personality theories- Type theory- Trait theory- Psycho analytical theory.

(15 hours)

**Module II.**

**Motivation**

Process of motivation -theories of motivation -Need Hierarchy theory -Theory X and Theory Y - Two Factor theory -Alderfer's theory -Mc Clelland's learned need theory -Victor Vroom's expectancy theory -Stacy Adams Equity theory.

(20 hours)

**Module III.**

**Group Dynamics and Team Development**

Group Dynamics -Definition and Importance -Types of groups -Group formation -Group Development -Group composition -Group performance factors -Principle centered approach to team development.

(20 hours)

**Module IV.**

**Organizational Conflicts**

Dynamics and Management -Sources -Patterns -Levels and Types of Conflict, Traditional and Modern approaches to conflict: Functional and Dysfunctional Organizational conflicts, Resolution conflict- Transactional analysis.

(10 hours)

**Module V.**

**Organizational Development**

Concept -Need for change -Types -Resistance to change -Theories of planned change, Organizational Diagnosis -OD intervention -Benefits and limitations of OD.

(15 hours)

**Practice Hours**

(10 hours)

**Total Hours**

**(90 hours)**



**BOOKS FOR REFERENCE:**

1. Hersey, Paul, Kenneth H and Derry E. Johnson. Management of Organizational Behaviour, Prentice Hall, New Delhi.
2. Koontz, Harold, Cyril O' Donnell and Heinz Weihich. Essentials of Management, Tata McGraw Hill, New Delhi.
3. Roffins Stephen P. Organizational Behaviour, Prentice Hall, New Delhi.
4. Sukla Madhukar. Understanding Organization Theory and Practice in India, Prentice Hall, New Delhi.
5. Banarjee M Organizational Behaviour, Allied Publishers Pvt. Ltd. Bombay.
6. Prasad L. M. Organizational Behaviour, Sultan Chand & Co. New Delhi.
7. Agarwall R. D. Organization and Management, Sultan Chand & Co. New Delhi.
8. M.N. Misra: Organizational Behaviour

**KANNUR UNIVERSITY**

**COM1C05 ACCOUNTING FOR BUSINESS DECISIONS**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVE:** To acquaint the students with the tools and techniques for business decisions.

**Module I.**

Introduction: Management Accounting : Need and Importance -Meaning -Definition - Objectives-Scope. (3 Hours)

**Module II.**

New Trends in Budgeting : Problems in Traditional Budgeting -Zero Base Budgeting (ZBB) Process -Advantages -Difference between Traditional Budgeting and Zero Base Budgeting Programme Budgeting -Performance Budgeting -Distinction between Programme Budgeting and Performance Budgeting -Participative Budgeting -Responsibility Accounting -Meaning and Definition -Responsibility Centres -Social Accounting -Government accounting and Environment accounting (Only relevant issues related to business decisions). (25 Hours)

**Module III.**

Long Term Investment Decisions: Capital Budgeting -meaning -importance -process Evaluation Techniques -Urgency -Payback -ARR -Improvement on traditional approach -Discounted Cash flow Techniques -Net Present Value -Internal Rate of Return -Terminal Value Method - Profitability Index -Capital Rationing. (20 Hours)

**Module IV.**

Risk Analysis in Capital Budgeting: Relationship between risk and returns -Techniques: Risk Adjusted Discount Rate -Certainty Equivalent Coefficient -Sensitivity Analysis -Probability Assignment -Standard Deviation -Coefficient of Variation -Decision Tree Analysis -Game Theory. (12 Hours)

**Module V**

Cost of Capital: Meaning -Definition -Assumptions -Importance -Types of cost of capital Theories of cost of capital -Factors determining cost of capital -Methods of computing cost of equity share capital -cost of preference share capital -cost of debt capital -cost of retained earnings -Weighted average cost of capital. (20 Hours)

**Hours Practice**

(10 Hours)

**Total Hours**

(90 Hours)

**BOOKS FOR REFERENCE:**

- |                                      |                                       |
|--------------------------------------|---------------------------------------|
| 1. Anthony Robert :                  | Management Accounting Principles      |
| 2. I. M. Pandey :                    | Management Accounting                 |
| 3. Sharma & Gupta :                  | Management Accounting                 |
| 4. V. K. Saxena & C.D. Vashits :     | Advanced Cost & Management Accounting |
| 5. Khan & Jain :                     | Management Accounting                 |
| 6. S. N. Maheswari :                 | Management Accounting                 |
| 7. Hingoram N.L. & Ramanathan A.R. : | Management Accounting                 |
| 8. Betty J. :                        | Management Accounting                 |
| 9. S.K. Battacharya                  | Accounting for Management             |

**KANNUR UNIVERSITY**

**COM2C06 STRATEGIC MANAGEMENT**

**90 Hours**

**Credit 04**

**Course Objectives:**

1. To give the students an awareness about the importance of strategic management in modern organizations.
2. To give the students an in-depth knowledge in Strategic management process.
3. To develop among the students the skill of managing organizations in the new age.

**Module I.**

**Concepts of Strategic Management** : Strategy and Strategic Management -Strategic Decisions Approaches to Strategic Decision Making -Hierarchy of Business Objectives -Levels of Strategies – Strategic Intent -Dimensions of Business Definition -Elements of Strategic Management Process Corporate Governance and Strategic Management.  
(10 Hours)

**Module II.**

**Strategy Formulation** : Environmental Analysis and Diagnosis -Environmental Sectors Environmental Scanning and Appraisal -ETOP -Organizational Appraisal : Methods and Techniques -SWOT Analysis -Corporate Level Strategies : Expansion, Stability, Retrenchment and Combination Strategies -Business Level Strategies. (15 Hours)

**Module III**

**Strategic Analysis and Choice** : Process of Strategic Choice -Strategic Analysis : Tools and Techniques -Corporate Portfolio Analysis -SWOT Analysis -Experience Curve Analysis -Life Cycle Analysis – Industry Analysis -Strategic Group Analysis -Competitor Analysis -Subjective Factors in Strategic Choice -Contingency Strategies -Strategies Plan.  
(20 Hours)

**Module IV.**

**Strategy Implementation** : Activating Strategies -Nature and Barriers of Implementation - Project Implementation -Procedural Implementation -Resource Allocation -Structural Implementation Structures for Business Strategies and Corporate Strategies -Behavioral Implementation Functional and Operational Implementation -Functional Plans and Policies.  
(20 Hours)

**Module V**

**Strategic Evaluation and Control** : Nature, Importance, Requirements and Barriers in Effective Evaluation -Strategic Control -Operational Control -Techniques of Strategic Evaluation and Control -Role of Organizational Systems in Evaluation. (15 Hours)

**Practice Hours**

(10 Hours)

**Total Hours**

**(90 Hours)**

**BOOKS FOR REFERENCE:**

1. Strategic Management Theory -Charles W.C. Hill and Gareth R. Jones.
2. Competitive Strategy -Michael E. Porter.
3. Business Policy -Azhar Kazmi
4. Strategic Management -Francis Cherunilam.
5. Strategic Management in Indian Companies -R.A. Sharma.
6. Corporate Strategic Management -R.M. Srivastava.
7. Strategic Management: Analysis-Implementation-Control: Nag A. (Vikas Pub.)

**KANNUR UNIVERSITY**

**COM2C07 RESEARCH METHODOLOGY & COMPUTER APPLICATION**  
**90 Hours** **Credit 04**

**COURSE OBJECTIVES:**

1. To make the students understand the steps in the process of Social Research.
2. To equip the students to apply statistical tools for hypothesis test and decision making.

**COURSE INPUTS:**

**Module I**

Introduction to Research -Meaning and Definition -Characteristics -Importance -Objectives. Different methods of social research -Historical -Case study -Survey -Experimental -Action research.  
(Contact Hours 15)

**Module II**

Research Design -Meaning and objectives -Steps -Components and characteristics -Types of research designs -Descriptive -Diagnostic -Exploratory -Experimental Designs. Identification of Research Problem -Formulating Hypothesis -Meaning and types of Hypothesis.  
(Contact Hours 20)

**Module III**

Data Source and Sampling -Sources of Data -Primary and Secondary sources -Techniques of Primary Data Collection -Questionnaire -Interview schedule -Sample selection -Methods of sampling -Probability and non probability sampling. (Contact Hours 15)

**Module IV**

Chi Square Test and Analysis of Variance -Chi Square Test -Uses. Analysis of variance One Way and Two Way Classification. Application of Statistical tools for Analysis and testing of significance -Parametric and Non parametric test -ANOVA and F test .  
(Contact Hours 10)

**Module V**

Use of Computers in Research- Practical uses and applications of Statistical Packages in Social Science (SPSS) -Applications by using computer software -MS Excel / Spread Sheet, SPSS, POWER POINT  
(Contact Hours 10)

**Module VI**

Report writing and presentation of findings -Meaning of Research report -Presentation Essential parts of report -Contents -Format -Writing style -Qualities of good research report Model form of Research Report  
(Contact Hours 10)

**Practice Hours**

(10 Hours)

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

- |                                |                                               |
|--------------------------------|-----------------------------------------------|
| 1. O.R. Krishnaswami           | Research Methodology in Social Sciences.      |
| 2. C.R. Kothari                | Research Methodology -Methods and Techniques. |
| 3. P. Saravanavel              | Research Methodology.                         |
| 4. S.R. Baja                   | Methods of Social Survey and Research.        |
| 5.R.N. Sharma, R.K. Sharma     | Research Methods in Social Science.           |
| 6.Dr. S. R. Bajpai             | Methods of Social Survey and Research.        |
| 7. B.N. Gosh                   | Research Methodology.                         |
| 8.Thripathi                    | Research Methodology in Social Sciences.      |
| 9. Deepak Chawla & Neena Sodhi | Research Methodology.                         |
| 10.A. Leon                     | Fundamentals of Information Technology        |

**KANNUR UNIVERSITY**

**COM2C08 COSTING FOR MANAGEMENT DECISIONS**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

1. To understand the concept and importance of cost accounting.
2. To understand the application of cost accounting tools for generating information for managerial Decision making.

**Module I.**

Cost Accounting -Objectives, nature and scope of cost accounting -Cost accounting and managerial decision (10 Hours)

**Module II.**

Marginal costing and cost volume profit analysis -Decision making -Break even analysis Assumptions -Advantages and limitations -Break even charts -Different types of break even charts -Simple break even chart -Contribution break even chart -Cash break even chart -Control break even chart -Profit volume graphs -Marginal costing and decisions regarding product mix, make or buy decisions and dropping of products. (25 Hours)

**Module III.**

Differential Cost Analysis -Meaning -Characteristics -Difference between differential cost analysis and marginal costing -Applications and use of differential costing. (15 Hours)

**Module IV.**

Standard costing as a Control Technique -Setting of Standards and their revision -Variance Analysis -Importance -Kinds of variances and their uses -Material, labour and overhead variances Interpretation of variances -Disposal of variance -Relevance of variance analysis to budgeting and standard costing -Standard costing as a management tool -Limitations of standard costing. (20 Hours)

**Module V.**

Value Analysis and Cost Reduction -Relevant terms of value -Basic steps in value analysis - Value engineering -cost reduction and cost control -Advantages of cost reduction and cost control -Areas of cost reduction -Techniques of cost reduction. (10 Hours)

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**



**BOOKS FOR REFERENCE:**

- |                                             |                            |
|---------------------------------------------|----------------------------|
| 1. Costing for Managerial Decisions         | Jain & Narang.             |
| 2. Management Accounting                    | S.P. Gupta.                |
| 3. Advanced Cost Accounting                 | Nigam & Sharma.            |
| 4. Cost Accounting, Principles and Practice | Lall B.M. & I.C. Jain.     |
| 5. Practical Costing                        | P.C. Tulsian.              |
| 6. Advanced cost and Management Accounting  | V.K. Saxena & C.D. Vashit. |

**KANNUR UNIVERSITY**

**COM2C09 ADVANCED BUSINESS ACCOUNTING**

**90 Hours**

**Credit 04**

**Course Objectives:**

1. To understand new accounting concepts.
2. Expose the students to advanced accounting issues and practices.

**Module I.**

Valuation of Shares : Valuation of Shares -Need for valuation -Methods of valuation Asset backing -Yield methods. (10 Hours)

**Module II.**

Accounting Standards : International and Indian Accounting Standards -Importance and need -Arguments for and against Standards -Steps in formulation of Accounting Standards -Accounting Standard Board -Constitution -Indian Accounting Standards. (15 Hours)

**Module III.**

Accounting for Specialised type of Business : Voyage accounts -Investment accounts Farm accounts. (15 Hours)

**Module IV.**

Accounting for Price level changes : Methods -CPP and CCA methods. (15 Hours)

**Module V.**

Human Resources Accounting : Meaning and importance -Methods -Replacement Cost -Opportunity Cost -Historical Cost. (5 Hours)

**Module VI.**

Government Accounting : General Principles -Special features -Comparison with Commercial Accounting -Public Accounts Committee (10 Hours)

**Module VII.**

Insurance Claims : Computation of Fire Claims -Loss of Stock -Consequential Loss Policy.

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

- |                                    |                                 |
|------------------------------------|---------------------------------|
| 1. Advanced Accounts. -            | M.C. Shukla and T.S. Grewal     |
| 2. Advanced Accountancy -          | S.P. Jain & K.L. Narang.        |
| 3. Advanced Accountancy -          | R.L. Gupta and M. Radhaswami    |
| 4. Advanced Accountancy -          | S.N. Mahewari                   |
| 5. Advanced Accountancy -          | Arulandam & Raman               |
| 6. Advanced Financial Accounting - | Dr. B.D. Agarwal                |
| 7. Financial Accounting -          | S.N. Maheswari & S.K. Maheswari |

**KANNUR UNIVERSITY**

**COM2C10 FINANCIAL MANAGEMENT**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

Understand the conceptual framework of Financial Management and to equip the students with knowledge about the Financing, Dividend and Liquidity areas of financial decision making in business organizations.

**Module I.**

Financial management -Meaning and nature -Scope -Traditional vs. Modern concept -Goal of Financial Management -Profit vs Wealth maximization -Finance function -Financial Planning Role of Finance Manager. (10 Hours)

**Module II.**

Operating and Financial Leverage -Effect on profits -EBIT -EPS analysis -Comparing alternative financial plans -Combined Leverage. (10 Hours)

**Module III.**

Capital structure -Factors affecting capital structure -Theories of Capital structure -Net Income Approach -Net Operating Income Approach -Traditional Theory -MM Theory. (15 Hours)

**Module IV.**

Dividend Policy -Theories of dividend policy -Walter's Model, Gordon's Model -MM Hypothesis -Aspects of dividend policy -Forms of dividend -Bonus shares -Stability of dividend. (20 Hours)

**Module V.**

Management of Working Capital -Meaning -Significance -Types -Operating cycle and other methods of estimation of working capital -Financing of working capital -Management of cash and marketable securities Receivables management and credit policy -Inventory management. (25 Hours)

**Practice Hours**

(10 Hours)

**Total Hours**

90 Hours

**BOOKS FOR REFERENCE:**

1. I.M. Pandey: Financial Management: Vikas Publishing House, New Delhi.
2. Prasanna Chandra : Financial Management: Tata Mc Graw Hills, New Delhi.
3. M.Y. Khan & P.K. Jain : Financial Management : Tata Mc Graw Hills, New Delhi.
4. Brealy and Steward : Corporate Finance : Mc Graw Hill, New York.
5. Bhattacharya : Working Capital Management, Strategies and Techniques : Prentice Hall, Delhi.
6. R.K. Sharma & S.K. Guptha : Financial Management.
7. V. K. Bhalla : Financial Management and Policy.
8. S.C. Kuchal : Financial Management.

**KANNUR UNIVERSITY**

**COM3C11 MARKETING MANAGEMENT**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

1. To acquaint the students with the marketing principles and practice.
2. To understand the process of modern marketing.

**Module I.**

Introduction to marketing: Concept, Nature, Scope and Importance of Marketing -Marketing concepts -Recent trends in marketing -Process of Marketing management -Marketing Management tasks -Strategic Marketing Planning -Marketing Organization in control -Green Marketing, Event Marketing, Interest Marketing and Viral Marketing -Social, Environmental and Ethical issues in marketing -Segmentation, targeting and positioning -Marketing mix.

(20 Hours)

**Module II.**

Consumer Behaviour : Concept and characteristic -Buyer Behaviour -Consumer decision making process -factors influencing buying behaviour -Consumer value -Consumer satisfaction and consumer delight -Relationship marketing -Consumer protection in India.

(10 Hours)

**Module III.**

Product decisions -Concept of product -Core product and augmented Product -Product line and mix decisions -Product life cycle -New Product development process -branding and packaging -marketing Myopia.

(15 Hours)

**Module IV.**

Pricing decisions -Factors affecting pricing decisions -pricing policies and strategies Methods of pricing -Price adjustment strategies.

(10 Hours)

**Module V.**

Promotion and Distribution decisions -Marketing communication -Promotion mix-advertising advertising budget -Advertisement copy advertising media -Sales promotion tools and techniques personal selling and salesmanship -Management of Marketing channels -Wholesalers and retailers -new retail formats -Recent trends in Channel Management.

(15 Hours)

**Module VI.**

Rural Marketing: Features of rural marketing in India -Problems of rural marketing -Rural marketing strategies -Agricultural marketing in India.

(10 Hours)

**Practice Hours**

(10 Hours)

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

- |                                |                      |
|--------------------------------|----------------------|
| 1. Philip Kotler -             | Marketing Management |
| 2. Sherlekar S.A. -            | Marketing Management |
| 3. S.P. Bansal -               | Marketing Management |
| 4. Chabra -                    | Marketing Management |
| 5. Rajan Nair -                | Marketing Management |
| 6. Arun Kumar & N. Meenakshi - | Marketing Management |

**KANNUR UNIVERSITY**

**COM3C12 CORPORATE ACCOUNTING**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES :**

To familiarize the student knowledge about the Corporate Accounting System,

**Module I.**

Amalgamation, Absorption and Reconstruction of Companies -Meaning -Objectives  
Amalgamation in the nature of Purchase -Amalgamation in the nature of Merger -Inter Company  
Owings -Unrealized profit -Inter Company Holdings -Internal Reconstruction -Reduction of  
capital -Steps for reconstruction (15 Hours)

**Module II.**

Liquidation of Companies -Meaning -Methods of winding up -Statement of Affairs -Deficiency /  
Surplus Accounts – Liquidator’s Final Statement of Accounts -Receivers Statement of Accounts.  
(15 Hours)

**Module III.**

Double Account System -Meaning -Double Account System Vs Double Entry System  
Advantages and Disadvantages (15 Hours)

**Module IV.**

Holding Company -Concept and Definition -Principles of consolidation -Contingent liabilities -  
Unrealised profits -Revaluation of assets and liabilities -Issue of Bonus Shares and Dividend by  
Subsidiaries -Reciprocal Stock holding. (20 Hours)

**Module V.**

Final Accounts of Insurance Companies -Final Accounts of Life and General Insurance  
Companies in the prescribed forms -Determination of profit of Life Insurance Business.  
(15 Hours)

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**



**BOOKS FOR REFERENCE:**

- |                           |                                 |
|---------------------------|---------------------------------|
| 1. Advanced Accounts. -   | M.C. Shukla and T.S. Grewal     |
| 2. Advanced Accounting -  | Ashok Seghal & Deepak Seghal    |
| 3. Advanced Accountancy - | R.L Gupta & M. Radhaswami       |
| 4. Advanced Accountancy - | Arulandan & Raman               |
| 5. Advanced Accountancy - | S.P. Jain & K.L. Narang         |
| 6. Accountancy -          | Dr. S. Kr. Paul                 |
| 7. Corporate Accounting - | S.N. Maheswari & S.K. Maheswari |

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**KANNUR UNIVERSITY**

**COM3C13 INCOME TAX LAW AND PRACTICE**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

To provide the students an in-depth knowledge of the basic concepts of Income Tax and the provisions relating to the computation of Total income and tax liability of an individual assessee.

**Module I.**

Introduction -Basic concepts -Capital and Revenue -Residence and incidence of Tax -Exempted incomes. (10 Hours)

**Module II.**

Heads of income -Salary -Chargeability -Computation -Allowances -Perquisites -Profits in lieu of Salary -Provident Funds -Deductions (15 Hours)

**Module III.**

Income from House Property -Chargeability -Annual Value -Computation -Deductions (15 Hours)

**Module IV.**

Profits and Gains of Business or Profession -Business -Profession -Chargeability -Computation of Profits and Gains -Deductions -Amounts not deductible -Depreciation (15 Hours)

**Module V.**

Capital Gains -Chargeability -Short term and Long term -Computation -Deductions -Exemptions Computation of Tax. (10 Hours)

**Module VI.**

Income from other Sources -Chargeability -General -Specific -Computation -Deductions (5 Hours)

**Module VII.**

Aggregation of Income -Clubbing -Set Off and carry forward of losses -Deductions from Gross Total Income -Computation of Total income and Tax liability of Individuals and HUF. (15 Hours)

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. Mehrotra & Goyal : Income Tax Law and Practice : Sahitya Bhavan, Agra
2. V.K. Singhaniya : Direct taxes Law and Practice : Taxman
3. B.S. Raman : Income Tax Law & Practice : United Publishers
4. Bhagvati Prasad : Direct Taxes : Viswa Prakasan
5. A.P. Philip : Direct Taxes Law ad Practices : SOBA Publications

**KANNUR UNIVERSITY**

**COM3C14 WEALTH TAX AND INDIRECT TAXES**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

To provide an overview of the indirect tax system in India and an in-depth understanding of the Wealth Tax Act, 1957.

**Module I**

Wealth Tax Act 1957 -Chargeability -Deemed wealth -exemptions -Valuation of assets  
Computation of net wealth and tax. (20 Hours)

**Module II**

Customs Act 1962 -Definitions -Notified goods -Specified goods -Levy of duty -Warehousing,  
clearance and transport of goods -Drawback of duties -Adjudication and appeal before customs  
authorities and Tribunal. (15 Hours)

**Module III**

Excise Duty -Central Excise and Salt Act of 1944 -Nature and Scope of levy -excisable goods  
manufacture -Valuation of excisable goods -Types of duties -Payment of excise duty -Removal  
of goods -CENVAT -Exemption -Recovery and refund of duties -Appeals. (15 Hours)

**Module IV**

Service Tax- Basics Concepts-Point of taxation-place of provision of service- Abatements and  
Exemptions-main provision of service tax- Computation of Service Tax- Assessment procedure-  
Appeals, Refund and Penalties. (10 Hours)

**Module V**

Value added Tax -Features -Taxable and exempt supply -Input and output -Basic VAT rates  
Goods outside VAT -Calculation of VAT -Manufacturer's stage and Retailer's stage -Merits and  
Demerits of VAT -Incidence and Levy -input Tax credit -Turn over -Registration and permit  
Security -Suspension of Registration. (20 Hours)

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. V.S. Datey : Indirect Taxes -Law and Practice
2. R.K. Jain : Central Excise Law Manual and Central Excise
3. Taxman's : CENVAT Law and Procedure
4. Dinkar Pagare : Business Taxation
5. H.C. Mehrotra and Goyal : Direct and Indirect Taxes
6. Vinod K. Singhanian : Direct Taxes Law and Practice

**KANNUR UNIVERSITY**

**COM3C15 HUMAN RESOURCE MANAGEMENT**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

1. To familiarize the students with the human resource management processes.
2. To sensitize them to the training process and techniques, and
3. To provide them with appropriate knowledge and skills required for selecting, developing and managing human resources.

**Module I**

Human Resource Management (HRM) : Functions of HRM. Role and status of HR Manager in an organization. HR policies: HR planning process; Recruitment: Selection; Training and Development; Performance appraisal: methods of techniques of performance appraisal; promotion and Demotions; Transfer, Separations: resignation; discharge; dismissal; suspension; retrenchment: lay off; Industrial relations. Emerging issues in HRM.

(30 Hours)

**Module II**

HRD: Concept of HRD: Training and development: Training process: an overview: role, responsibilities and challenges to training managers and employees; Organisation and management of training function; training needs assessment and action research; instructional objectives and lesson planning; learning process.

(15 Hours)

**Module III**

Training climate and pedagogy: developing training modules; training methods and techniques; facilities and training aids. Technical training: training for TQM: attitudinal training, training for management change; training for productivity; training for creativity and problem solving; training for leadership and training for trainers.

(15 Hours)

**Module IV**

Grievance handling: Grievance -meaning and causes of grievance -importance and procedure of grievance handling; Hot Stove rule; code of discipline. Suggestion scheme; Importance of suggestion scheme; implementation of suggestion scheme.

(10 Hours)

**Module V**

- (a) HR outsourcing: legal requirements; contractor's liabilities; liabilities of the company towards contractor's labourers.
- (b) HR records: objectives of HR record : absenteeism:
- (c) HR appraisal and audit: concept, scope, methods and importance of HR audit
- (d) Group dynamics.

(10 Hours)

**Practice Hours**

(10 Hours)

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. Aswathappa K. : Human Resource and Personnel Management;  
Tata McGraw Hill, New Delhi 1997.
2. Hollway J. ed: Performance Measurement and Evaluation: Sage Publications;  
New Delhi 1995.
3. Gupta. C.B: Human Resource Management;
4. Heneman and Schwal: Human Resource Management.
5. Prasad L.M.: Human Resource Management.
6. P.G. Aquinas Human Resource Management-Principles and Practice

**KANNUR UNIVERSITY**

**ELECTIVE -FINANCE**

**COM4E01 SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

1. To acquire knowledge of securities markets and its theoretical foundations
2. To help the students to equip the trading of securities.

**Module I :**

**INVESTMENT:** Meaning and Objectives-Financial Market and its Functions-Classification-Investment Avenues –Financial Assets: Non marketable and Marketable-Money Market Instruments, Fixed Income Securities, Equities and Mutual Fund Schemes. Investment Attributes- Risk Return Trade off-Investment v/s Speculation- Hedging- Portfolio Management Process.

Contact Hours – 10

**Module II :**

**SECURITIES MARKET:** Participants in the Securities Market and their Roles- Structure of Securities Market- Primary Market and Secondary Market Operations- Trading Mechanism- Stock Market Quotations- Stock Market Indices – BSE, NSE, OTCEI- Role of SEBI. Government Securities Market- Corporate Debt Market.

Contact Hours -20

**Module III :**

**SECURITY ANALYSIS:** Debt Instruments and their Valuation- Bond Characteristics- Bond Prices- Bond Yields- Rating of Bonds- Equity Instruments and their Valuation- Fundamental Analysis: Economy, Industry and Company Analysis- Technical Analysis: Charting Tools- Dow Theory- Elliot Wave Theory- Market Indicators- Derivatives and their Valuation.

Contact Hours -20

**Module IV :**

**PORTFOLIO THEORY:** Portfolio Return and Risk- Capital Market Pricing Model- Efficient Market Theory- Random Walk theory- Markowitz Model- Arbitrage Pricing Theory- Prospect Theory. Portfolio Management Frame work-: Objectives and Constraints, Asset Mix, Selection of Securities and Portfolio Execution.

Contact Hours -15

**Module V :**

**PORTFOLIO PERFORMANCE EVALUATION-** Rate of Return- Risk- Performance Measure- Treynor's Measure- Sharpe's Measure- Jensen's Measure- Problems of Portfolio Management- Active and Passive Portfolio Strategies- Rebalancing Portfolios- Portfolio Management Plans- Formula Plans- Cost Averaging Plan- Constant Value Plan- Constant Ratio Plan- Variable Ratio Plan- Portfolio Revision.

Contact Hours -15

**Practice Hours**

(10 Hours )

**Total Hours**

**90 Hours**



**BOOKS FOR REFERENCE:**

1. **Prasanna Chandra:** Security Analysis and Portfolio Management-Tata McGraw Hill Publishing Co. Ltd.
2. **Punithavathy Pandyan:** Security Analysis and Portfolio Management- Vikas Publishing House Pvt Ltd.
3. **M. Ranganathan & R. Madhumathi:** Security Analysis and Portfolio Management-Dorling Kindersley Pvt. Ltd.
4. **Donald E. Fischer & Ronald j. Jordan:** Security Analysis and Portfolio Management-Prentice Hall Inc.
5. **Bhalla, V. K.:** Investment Management- S. Chand & Co.
6. **Avadhani, V. A. :** Security Analysis and Portfolio Management- Himalaya Publishing House
7. **Hull, J:** Options, Futures and Derivatives- Prentice Hall Inc, New Delhi
8. **Preethi singh:** Investment Management - Himalaya Publishing House, Mumbai
9. **Dr. Kevin, S.:** Portfolio Management

**KANNUR UNIVERSITY**

**ELECTIVE A -FINANCE**

**COM4E02 INTERNATIONAL FINANCIAL MANAGEMENT**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

1. To introduce the basic concepts and tools of International Financial Management.
2. To provide them appropriate knowledge about foreign investment and financing decisions.

**Module I**

International Financial Management: Meaning; importance; scope; Problems; recent changes in International Financial Markets; foreign exchange markets; exchange rate definitions; spot and forward rates; alternative exchange rate regimes. (15 Hours)

**Module II**

Exchange rate determination; theories of foreign exchange rate; purchasing power parity theory; International fisher effect; portfolio balance model; balance of payment theory; exchange rate of rupee; recent trends; convertibility of Indian rupee. (20 Hours)

**Module III**

International monetary system: features, present exchange rate system; reforms of International monetary system; European monetary system; International debt; ABD; IBRD and IMF; functions; special schemes of lending; conditionalities of IMF lending; International liquidity and IMF; SRDs; International markets and instruments. (20 Hours)

**Module IV**

Balance of payment: meaning; accounting principles; valuation and timing; components; deficit and surplus; macro-economic factors affecting exchange rates; some open economy identities; open economy multipliers; SWIFT and interbank clearing among banks in different countries. (15 Hours)

**Module V**

Foreign investment and financing decisions: FII, FDI-types, motives and Effects -current issues in FDI -India's foreign investment policy. (10 Hours)

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. Henuing Charles -International Financial Management (Tata McGraw Hill)
2. Shapin Alan C -International Financial Management (Prentice Hall of India)
3. Aple. P.G. -International Financial Management (Tata McGraw Hill)
4. Alan C. Shapiro -Multi National Financial Management (Prentice Hall of India)

**KANNUR UNIVERSITY**

**ELECTIVE A -FINANCE  
COM4E03 FINANCIAL MARKETS AND SERVICES**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:** The objective of the course is help the student:

1. To understand the structure, organization and working of financial markets and institution in India.
2. To understand the various financial services available.

**Module I**

**Financial Markets**

Money and capital markets – money market – meaning – constituents – functions of money market – money market instruments – call money – treasury bills – certificates of deposits – commercial bills, trade bills etc – recent trends in Indian money market – Capital Market - depository systems – government securities market – recent developments in financial markets  
(20 hours)

**Module II**

**Derivative Trading**

Derivative trading – futures and options – forward markets – options – put options – call options – swaps – interest rate swaps – currency swaps.  
(10 hours)

**Module III**

**Development Banks**

Concept – objectives and functions of development banks – operational and promotional activities of development banks – IFCT – ICICI – IDBI – IRBI – SIDBI – state development banks – state financial corporations.  
(10 hours)

**Module IV**

**Non-Banking Financial Institutions**

LIC and GIC – insurance regulatory and development authority – role and functions – objectives and functions of UTI – role of UTI in industrial finance – concept and role of non-banking financial institutions – sources of finance – functions – investment policies of non – banking financial institutions in India – venture capital institutions. (15 hours)

**Module V**

**Mutual Funds and Merchant Banking**

Concept – performance appraisal and regulation of mutual funds (with special reference to SEBI Guidelines) – designing and marketing of mutual funds schemes – latest mutual fund schemes in India – concept of merchant banking – functions and growth – government policy – SEBI guidelines – future of merchant banking in India – role of merchant bankers in fund raising.  
(15 hours)

**Module VI**

**Factoring**

Concept – forms of factoring – legal aspects – factoring services in India.  
Credit rating – concept – types of rating agencies Credit cards – concept – billing and payment – settlement procedure – corporate credit cards – business cards – users of credit cards – current developments.  
(10 hours)

**Practice Hours**

**(10 hours)**

**Total Hours**

**90 hours**

**BOOKS FOR REFERENCE:**

1. Avadhani. Investment and Securities Markets in India, Himalaya publishing House, New Delhi.
2. Bhole, L.M. Financial Markets and Institutions, Tata Mc Graw Hills, New Delhi.
3. Bhalla, V.K. Investment Management.
4. Ghosh, D. Banking Policy in India, Allied Publications, New Delhi.
5. Giddy, I.H. Global Financial Markets, A.I.T.B.S. New Delhi.
6. Khan, M.Y. Indian Financial System, Tata Mc Graw Hills, New Delhi.
7. Varshney, P.N. Indian Financial System, Sultan Chand and Sons New Delhi.
8. Averbach, Robert, D. Money Banking and Financial Institutions, Himalaya Publishing House, Mumbai.
9. Machiraju, H.R. Merchant Banking: Principles and Practice.

**KANNUR UNIVERSITY**

**ELECTIVE A -FINANCE**

**COM4E04 CORPORATE TAX PLANNING AND MANAGEMENT**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

To acquaint the students with the method of computing total income and tax liability of different types of persons (excluding individuals and HUFs), to understand the concepts of tax planning and management; and the tax implications of various managerial decisions.

**Module I**

Assessment of Firms -Association of Persons -Trusts -Companies -Co-operative Societies. (20 Hours)

**Module II**

Income Tax Authorities -Assessment procedure -Collection -Advance Tax -TDS Recovery and Refund -Offences -Penalties and Prosecutions -Appeals and Revision. (10 Hours)

**Module III**

Introduction to Tax Management -Tax planning, Tax avoidance and Tax evasion -Tax planning for new business -Setting up -Location -Form of Organisation -Nature of business. (15 Hours)

**Module IV**

Tax planning and managerial decisions -Employee remuneration -Capital structure Dividend policy -Make or Buy decisions. (20 Hours)

**Module V**

Tax planning and business restructuring -Amalgamation -Merger -Shut down or continue (15 Hours)

**Practice Hours**

(10 Hours)

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. Vinod K. Singhanian: Direct Taxes Law and Practice : Taxman's, Delhi.
2. Vinod K. Singhanian: Direct Tax Planning and Management: Taxman's, Delhi.
3. R.N. Lakhota: Corporate Tax Planning : Vision Publications, Delhi.
4. Ahuja and Ravi Gupta : Systematic approach to Income Tax and Central sales Tax:  
Bharath Law House, Delhi.
5. Mahrotra and Goyal : Corporate Tax Planning and Management: Sahitya Bhavan,  
Agra.

**KANNUR UNIVERSITY**

**ELECTIVE B -MARKETING**

**COM4E05 CONSUMER BEHAVIOUR**

**90 Hours**

**Credit 04**

**Course Objectives:**

1. To understand the buying influences and behaviour of consumer and
2. To understand the models of consumer decision making.

**Module I**

Introduction to consumer behaviour -Need of the study of consumer behaviour in modern marketing Meaning and definition -nature, scope and application -consumer behaviour and consumer education -problems in studying consumer behaviour. The role of consumer research -limitations of the study of consumer behaviour. (15 Hours)

**Module II**

Marketing environment -Micro and Macro Environment -changing pattern of consumer expenditure -income and savings -levels of personal income -consumer adoption -social influence on consumers -demographic influence on consumer behaviour. (15 Hours)

**Module III**

Consumer needs and Motivation -Consumer needs and birth of buying idea-buying motives - positive and negative motivation -rational VS emotional motives -models of consumer decision making -economics models -psychological models -Sociological model -Howard Sheth model - recent trends in modeling consumer behaviour. (20 Hours)

**Module IV**

Consumer buying process -An overview of decision process -problem recognition and information search -information processing -Alternative evaluation -Purchase process and post purchase behaviour. (15 Hours)

**Module V**

Group dynamics and consumer behaviour -Meaning and types of groups -reference groups and group dynamics -family as a group -family buying influences and buying roles -culture and subculture influence and their influence on buying behaviour. (15 Hours)

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**



**BOOKS FOR REFERENCE:**

1. Consumer Behaviour - Leon G Schiffman & Leslie Lazer Kanuk.
2. Consumer Behaviour in Marketing Strategy - John A Howard.
3. Consumer Behaviour : Concepts and Applications - Laudsan Della.
4. Consumer Behaviour in India - Anitha Ghatak.
5. Problems of Consumer Behaviour in India - A Sarkar.

**KANNUR UNIVERSITY**  
**ELECTIVE B -MARKETING**

**COM4E06**

**ADVERTISING AND SALES MANAGEMENT**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

1. To make the students understand the issues related with advertisement salesmanship.
2. To help the students to equip the various tools in salesman shipment and selling practices.

**COURSE INPUTS:**

**Module I**

New developments in the selling practice -Telemarketing -relationship marketing -Retail selling and business to business selling -Electronic media -Emerging trends.

Contact Hours -15

**Module II**

Sales promotion and advertising -Evolution of Advertisement -Functions -Purpose Criticism of advertising -Causes of failure of advertising -Advertisement media and selection .

Contact Hours -15

**Module III**

Media Advertisement -Press -Magazines -Direct advertising -Cinema -Radio -TV etc.

Contact Hours -10

**Module IV**

Salesmanship and Sales Management -Salesmanship Definition -Importance of personal selling -Salesmanship whether productive or not -salesman authority -Knowing the sales field -Allocation of territory -Quota selling -techniques of sales forecasting.

Contact Hours -25

**Module V**

Sales manager -qualities -duties -sales force management -Recruiting -selecting Training -Compensation plans -Motivation -Evaluation.

Contact Hours -15

**Practice Hours**

Contact Hours – 10

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. Paylee J. F. : Marketing Principles
2. Manomoria & Joshi : Principles and Practices of Marketing India.
3. Dr. N. Rajan Nair : Marketing.
4. R. L. Joshi : Principles and Practices of marketing in India.
5. Prasher Ajay : Marketing practices & Marketing Strategy.
6. Chunnawalla & Sethia : Foundation of Advertising theory & practices.

**KANNUR UNIVERSITY**

**ELECTIVE -MARKETING**

**COM4E07 SERVICES MARKETING**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

To understand the present day markets of services including Banking, Insurance, Tourism, Hospital and consultancy services.

**Module I**

Introduction -Nature and Types -Distinction between Services and Good marketing Environment for Services marketing -segmentation -targeting and positioning -service marketing mix -pricing, promotion and distribution of services. (15 Hours)

**Module II**

Bank marketing -Concept -Users -Products -Bank marketing in the Indian Environment. (12 Hours)

**Module III**

Insurance Marketing -Concepts -Users -Products -Insurance marketing in the Indian Environment. (12 Hours)

**Module IV**

Tourism and Hotel Marketing -Concept -Users -Products -Tourism marketing in the Indian perspective -Hotel markets -Concepts -Users -Products -Hotel marketing in the Indian Environment. (15 Hours)

**Module V**

Consultancy Marketing -Concept -Users -Products -Consultancy marketing in the Indian Environment. (13 Hours)

**Module VI**

Hospital Marketing -Concepts -Users -Products -Hospital marketing in the Indian Environment. (13 Hours)

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. S.M. Jha : Services Marketing. Himalaya Publishing House.
2. Payana Adrim : An Essence of Services Marketing. Prentice Hall.
3. Christopher H. Lovelock: Services Marketing : Prentice Hall.

**KANNUR UNIVERSITY**

**ELECTIVE -MARKETING COM4E08**

**LOGISTICS MANAGEMENT**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

1. To enable the student to understand the fundamentals of logistics and the process involved storing, packing and distributing goods and the costs involved in these processes.
2. To enable the student to understand modern trends in logistical operations.

**Module I**

Introduction to Logistics -Management: meaning, features, scope, and importance, competitive advantage and logistics -supply chain and competitive performance -marketing and logistics interface -the work of logistics -integrated logistics, objectives, barriers to integration -logistics information -application of information technology. (20 Hours)

**Module II**

Inventory planning: concept, characteristics, types -conceptual frame work -inventory categorization -cost associated with inventory -inventory management techniques -EQQ, ABC Analysis, modern techniques, inventory management policies -inventory handling. (20 Hours)

**Module III**

- (a) Transportation -principles, participants in transportations decisions, modes of transport cost -factors.
- (b) Warehousing-need for warehousing management -role of logistical system-warehouse design, strategies, functions.
- (c) Storehouse operation and control -objectives -activities of store -organizing the store store location and layout -storage system -classification and codification -modern techniques-store keeping -verification. (20 Hours)

**Module IV**

Logistics costing -Total logistics cost -logistic performance evaluation -Activity based costing -logistical measurement -logistical organization. (10 Hours)

**Module V –**

Containers and Packages Management Packing techniques and materials -Techniques for mass distribution of consumer goods importance of packaging in cost reduction and sales promotion. (10 Hours)

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. Lamber D. et al - Strategic Logistics Management (Tata McGraw Hill)
2. Donald T. Boverox, David J Close, Omar K, Helferich -Logistical management (Mac Million Publishing Company)
3. Bowersox and Closs - Logistics Management
4. Krishnaveni Muthiah - Logistics Management and World Sea Home Trade (Himalaya Publishing Company).

**KANNUR UNIVERSITY ELECTIVE C -**

**INTERNATIONAL BUSINESS**

**COM4E09 INTERNATIONAL BUSINESS ENVIRONMENT**

**90 Hours**

**Credit 04**

**Course Objectives:**

1. To give the students an in-depth understanding about the global market in the changing world.
2. To provide to the students knowledge about the functional areas of the subject.

**Module I**

Dimensions of the International Environment : Global Economy and Globalisation Process  
Forces -Meaning, dimensions and stages in Globalisation -Kenchi Ohmae Model  
Internationalization v/s Globalization : the role of FDI -Transactional or Multinational  
Corporations -TNCs as drivers of the Global Economy -Trends in Globalisation Process -  
Globalisation of the firm -Organizational Debate. (15 Hours)

**Module II**

The Cultural & Social Environment: Cultural Diversity and Environment -Culture Defined  
Relation to business -National Cultures -Languages -Religion -Western values v/s Asian values  
Multicultural Societies -Culture Theories -Organization Culture -Culture Change -Cultural  
Globalization : Myth and Realty -Types of Society -Development of Modern Industrial Society  
Stratification in Societies -Changing Population -Urbanization -Labour Relations -Gender and  
Work -Families. (15 Hours)

**Module III**

Political Environment : The Political Sphere and Society -Nation states and Political Framework-  
Sources of Authority in the State -Democracy v/s Authoritarianism -Democratic Government  
Unitary and Federal Systems -Systems of Government : Presidential, Parliamentary and Hybrid  
Systems -Transitional Democracies -Global Politics.

(10 Hours)

**Module IV**

The International Legal Environment of Business : Interface between Legal System and  
Business -National Legal System -Legal Framework of the European Union -International  
Business Transactions -Resolution of Disputes in International Business -Crime Corruption and  
the Law -The growing impact of International Law on Business -Human Rights.

(15 Hours)

**Module V**

World Trade and International Competitive Environment : International Trade Theories -Trade  
Policy and National Priorities -Tools of Governmental Trade Policy -International Regulation of  
Trade -Trade Liberalization: The Doha Round -Regionalism -Developing Countries and World  
trade -Globalization and the World Trading system. (15 Hours)

**Module VI**

Technology and Innovation: Concepts and Process -Technological Innovation Theories -National  
Innovation Systems -Patents and Innovation -Technology Transfer -Information and  
Communication Technology (ICT) -Biotechnology -Globalization and Technological Innovation.

(10 Hours)

**Practice Hours**

(10 Hours)

**Total Hours**

**90 Hours**



**BOOKS FOR REFERENCE:**

1. International Business Environment, The Text and Cases, Sundaram & Black, Prentice Hall of India.
2. The Essence of International Business, Taggart and McDermott, Prentice Hall of India.
3. International Business, J. V. Prabhakara Rao and A.V. Ranganadhachary.
4. Janet Morrison, The International Business Environment Palgrave Macmillan, New York, 2007.
5. Bhall, V.K. and S. Shivaramu, International Business Environment and Business, New Delhi, Anmod, 1995.
6. Bhall, V.K. International Economy, Liberalisation Process, New Delhi, Anmol, 1993.
7. Daniel, John D and Rdebanh, Lee H. International Business, 5th ed., New York, Addison Wesley, 1989.
8. Eiterman, D. K. and Stopnehill, Al. Multinational Business Fianance, New York, Addison Wesley, 1986.

**KANNUR UNIVERSITY ELECTIVE C -**

**INTERNATIONAL BUSINESS**

**COM4E10 FOREIGN TRADE MANAGEMENT**

**90 Hours**

**Credit 04**

**Course Objectives:**

1. To give the students an understanding about the dimensions of foreign trade.
2. To familiarize them with the risks in foreign trade and the tools of managing them.
3. To acquaint them with the institutions and agencies that monitor the foreign trade.

**Module I**

Dynamics of Foreign Trade: International Business -Distinction between foreign trade and domestic trade. Need and Significance of Foreign Trade, Free Trade vs. Protection Balance of Payment : Concept, Disequilibrium in BOP -Structural, Cyclic and Monetary Disequilibrium -Methods of correction -Trade barriers and Trade Strategy -International Trade Theories and their Business Implications -Process of Globalization (20 Hours)

**Module II**

Mechanics of Foreign Trade : Export Trade and Import Trade -Gains from Trade and Terms of Trade -Classical, Neo Classical and Modern Approach -Measurement of Gains from International Trade -Terms of Trade -Concepts -Tariffs and Quotas -Concepts of Optimum Tariff -Quotas: Meaning, Types and Effects. (20 Hours)

**Module III**

Problems of International Payments: Exchange Rates: Theories of Exchange Rate Determination -Spot and Forward Exchange Rates -Foreign Exchange Market -Methods of International Payments -International Liquidity -International Monetary Fund -Special Drawing Rights -Exchange Rate of Policy -Euro -Dollar Market. (15 Hours)

**Module IV**

Foreign Exchange Risk Management: Exchange Rate Movements -External and Internal Techniques of Risk Exposure Management -Management of Economic, Transaction and Translation Exposure – Hedging Operations. (10 Hours)

**Module V**

Legal and Institutional Framework for Foreign Trade: Special Economic Zones Regional Trading Blocks -European Economic Community -EU, NAFTA, SAARC -Bilateral and Multilateral Trade Laws -General Agreement on Trade and Tariffs (GATT) -World Trade Organization (WTO) -Seattle and Doha round of Talks -Dispute settlement mechanism under WTO -GATS -IPRs. (15 Hours)

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. Jeevanandam C., “Foreign Exchange: Practices, Concepts and Control”, Sultan Chand,
2. The Essence of International Business, Taggart and McDermott, Prentice Hall of India.
3. International Business -Francis Cherunilam.
4. International Business -Rao and Rangachari.
5. Black and Sundaram : International Business Environment, Prentice Hall of India, New Delhi.
6. Gosh, Biswanath : Economic Environment of Business, South Asia Book, New Delhi.
7. Aswathappa : International Business, Tata McGraw Hill Publications, New Delhi.
8. Schmothoff C.R. : Export Trade -The Law and Practice of International Trade.
9. WTO and International Trade – M.B. Rao

**KANNUR UNIVERSITY ELECTIVE C -**

**INTERNATIONAL BUSINESS**

**COM4E11 INTERNATIONAL BANKING**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

1. To enable the students to familiarise the banking activities in modern era.
2. To study the banking activities in the International Market.

**Module I**

Nature and Background of International Banks -Major National Financial Markets and their integration -International Finance and Investment -International Financial Institutions -IMF, World Bank, BIS, IIF -lending services -Documentation -Foreign Exchange Service -Investment Banking Services -Convertibility -Country Risk -Exchange Control Regulations -Features of the Liberalised Exchange Rate Management System (LERMS) -Role of RBI -Effect of Financial, Political and Economic events on the exchange rate. (15 Hours)

**Module II**

International Banking Market -Innovations -Added Sophistication regarding Derivatives, Futures and Options -Basel I & II Agreements -Financial Investments and Techniques -Currency and Interest Rates -Swaps, Commercial Papers -Their Variance -Syndication of Loans -Pricing and Marketing of Syndicated Loans -Rating of Banking and Non-banking Financial Institutions - Criteria for Ranking and Rating Agencies. (15 Hours)

**Module III**

Sources of Funds -Consideration for the bank as a borrower -Retail and Wholesale Customer and Inter -Bank Deposits -Certificates of Deposit and Bearer Deposit Notes -Bankers acceptances Commercial Papers -Private Placement -Subordinated Debit Issues (Fixed and Floating rate) raised by banks on the Domestic and the International Capital Markets -Banking Supervision RBI requirements -Internal Control -Risks Management -Exchange Control Regulation of Euro Market. (10 Hours)

**Module IV**

International Cash Management -Management of Accounts and Cash Positions -Reconciliations Liquidity -Central Bank Requirements -Switching of Funds -Targeting -Yield Objectives. (10 Hours)

**Module V**

Foreign Exchange -Loan Deposit and Security Transactions in Foreign Currencies -Foreign Exchange Regulations -Interests Accruals, Commission and Fees -Margin Requirements -Funding of Branch -Inter-Bank Agency Arrangements -Correspondent Bank and Inter-group of relationships. (10 Hours)

**Module VI**

Foreign Exchange Rates -Measuring Rate Movements -Factors affecting foreign exchange rates Forecasting Exchange Rates -International Party Relationship -Interest Rate Parity, Purchasing Power Parity and Fischer affects -Transaction Exposure -Hedging against Foreign Exchange Exposure. (10 Hours)

**Module VII**

Forward Market -Future Market -Options Market -Currency Swaps -Cross Currency Swaps Interests Rate Swap -International Financial Instruments (10 Hours)

**Practice Hours**

**(10 Hours)**

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. Richard M. evich - International Financial Markets -Tata McGraw Hill,  
New Delhi.
2. Adrian Buckley - Multinational Finance, Prentice Hall of India, New Delhi.
3. Vyuptakesh Shran - International Financial Management, Prentice Hall of India,  
New Delhi.
4. V. Sharma - International Financial Management.
5. P.G. Apte - International Finance -A Business Perspective.
6. V. K. Bhalla - International Finance Management.

**KANNUR UNIVERSITY ELECTIVE C -**

**INTERNATIONAL BUSINESS**

**COM4E12 INTERNATIONAL MARKETING**

**90 Hours**

**Credit 04**

**COURSE OBJECTIVES:**

1. To provide the students a theoretical framework regarding International Market.
2. To give an in depth understanding about the institutional infrastructure relating to International Market.

**Module I**

International Marketing -Definition -Scope -Concepts -Reasons and Motivations -Global Vs Domestic Marketing -Concepts of Export -International Marketing Management -World Trade and India's Foreign Trade; an overview -Institutional Framework for Exports in India.

(10 Hours)

**Module II**

Global Marketing Environment -Cultural, Political, Legal and Economic Environment -PEST Analysis -Strategic Planning and Growth Strategies in International Marketing.

(10 Hours)

**Module III**

International Market Selection -International Marketing Research -Methods of conducting International Marketing Research -Development and management of International Marketing research.

(10 Hours)

**Module IV**

Forms of International Market Entry -Export and Import activities -Market Entry Methods requiring low capital Investment (licensing and franchising) -Capital Intensive Entrance into Foreign Markets Factors influence decisions about the entry options.

(10 Hours)

**Module V**

Segmentation of International Markets -Segmentation Strategies -Criteria for the Segmenting of the Consumer Goods Markets -Selection of Target Markets -Positioning in the International Environment .

(10 Hours)

**Module VI**

International Product Policy -Adaptation of the International Product Policy -International Product Policy -International Product Mix -Phase in the Product Life Cycle -International Brand Policy New Trends -Strategies in Brand Management.

(10 Hours)

**Module VII**

International Pricing Policy -Factors in Selection of Pricing Policy -Policies through out the Product life cycle -Process of creating prices -International Distribution Policy -Trends in International Distribution Policy -Influence of Internet on International Distribution.

(10 Hours)

**Module VIII**

International Communication Policy -Communication Strategies in the International Environment Instrument of the International Communication Mix -International Advertisement and Sales Promotion -Personal Selling and other forms Direct Marketing.

(10 Hours)

**Practice Hours**

(10 Hours)

**Total Hours**

**90 Hours**

**BOOKS FOR REFERENCE:**

1. Varshney and Bhattacharya - International Marketing Management.  
An Indian Perspective. Sultan Chand and Sons,  
New Delhi.
2. Keegen - Global Marketing Management, Prentice Hall of  
India, New Delhi
3. Philip Cateora & John Graham - International Marketing. Tata McGraw Hill, New  
Delhi.
4. D.C. Kapoor - Export Management. Vikas Publishing House, New  
Delhi.
5. Francis Cherunilam International Trade & Export Management
6. Mishra M. V. International Marketing Management
7. M.L. Varma Foreign Trade Management in India
8. Kripalani V. H. International Marketing.
9. Rajagopal International Marketing.

Annexure V  
Model Question Paper M.COM. (Pattern)  
(Questions should be asked from all modules following a uniform distribution.)

Time : 3 Hrs.

Max. Marks: 60

Section –A  
(Answer any FOUR .....)

1 mark for part a)

3 marks for part b)

5 marks for part c)

1. a) Direct type question (to test knowledge acquired)
- b) Understanding type
- c) Problem type ( Ability to synthesize knowledge or critical evaluation of knowledge)
2. a).....
- b).....
- c).....
3. a).....
- b).....
- c).....
- 4 a).....
- b).....
- c).....
- 5 a).....
- b).....
- c).....
- 6 a).....
- b).....
- c).....

(4 x 9 =36 Marks)

Section B

7. a) Essay question from one or more modules (Don't repeat the same module)
  - or
  - b) Essay question from one or more modules (Don't repeat the same module )
  8. a) Essay question from one or more modules (Don't repeat the same module)
  - or
  - b) Essay question from one or more modules (Don't repeat the same module )
- (2 x 12 =24 Marks)



# **KANNUR UNIVERSITY**

## **MODEL QUESTION PAPERS (M.COM.)**

FOR THE POST GRADUATE DEGREE PROGRAMME IN  
COMMERCE (M.Com) UNDER CREDIT BASED SEMESTER SYSTEM (CBSS-PG)  
FOR AFFILIATED COLLEGES IMPLEMENTED WITH EFFECT  
FROM 2014-15 ACADEMIC YEAR

**Submitted to**

**THE KANNUR UNIVERSITY**

**PG BOARD OF STUDIES COMMERCE**

Reg. No.....

*Model Question Paper*

Name.....

## First Semester M. Com. Degree Examinations, November 2014

### COM1C01 – BUSINESS ENVIRONMENT AND POLICY

Time: 3 Hours

Max. 60 Marks

### Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1.
  - a) Define the term 'business environment'.
  - b) List the major components of the internal and external environment of business.
  - c) "Firms which systematically analyze and diagnose the environment are more effective than those which don't." Elucidate.
  
2.
  - a) What do you understand by 'Multi - National Corporations'?
  - b) Write any six characteristics of globalizations?
  - c) What are different modes of Foreign Direct Investment in India?
  
3.
  - a) What are Scheduled Industries?
  - b) What are the functions of the Central Advisory Council for industries in India?
  - c) Examine the powers of the Government of India to control and regulate industrial operations in the country.
  
4.
  - a) Define the term 'Corporate Governance'.
  - b) Explain Clause 49 of the Securities Exchange Board of India Act.
  - c) "Ethics and profits, though contradictory to each other, can go together." Do you agree?  
Substantiate your answer.
  
5.
  - a) State the meaning of the term 'mixed economy'?
  - b) Discuss the constituents of the economic environment of business.
  - c) Explain the economic policy regime influencing business in India.
  
6.
  - a) What do you understand by 'LERMS'?
  - b) Discuss the powers and functions of DGFT in India.
  - c) Examine the highlights of the Foreign Trade Policy 2009-14 of the GOI.

[4x9= 36 marks]

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**Section B**

Answer the two questions in this Section.

Each question carries 12 marks.

7. a) "By social responsibility we mean the intelligent and objective concern for the welfare of the society". Comment

OR

- b) Examine the rationale for industrial policy in developing economies in the background of the current industrial policy of India.

8. a) Explore the major provisions of the FEMA 1999 by examining the need for the replacement of the FERA 1973 with it.

OR

- b) Briefly discuss the Rules of WTO and analyze the sector-wise impact of these rules on the Indian economy.

**[2x12=24**

**marks]**

Reg. No.....

*Model Question Paper*

Name.....

## First Semester M. Com. Degree Examinations, November 2014

### COM1C02 – QUANTITATIVE TECHNIQUES & OPERATION RESEARCH

Time: 3 Hours

Max. 60 Marks

#### Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) Define probability.  
 b) What are mutually exclusive events?  
 c) One card is drawn from a standard pack of playing cards. What is the probability that it is neither a king nor a queen?
2. a) What is a random variable?  
 b) What do you mean expectations?  
 c) A petrol pump proprietor sells on an average Rs.800000 worth of petrol on rainy days and an average Rs.1000000 on clear days. The statistics from the meteorological dept. shows that the probability for clear weather is 0.86 and for a rainy weather is 0.14 for the coming Monday. Find the expected value of petrol sale on this day.
3. a) Define Binomial distribution.  
 b) What are the properties of Normal distribution?  
 c) The mean of Binomial distribution is 20 and the standard deviation is 4. Calculate n, p

- and q.
4. a) Define Hypothesis.  
b) State the features of a good hypothesis.  
c) Explain Type I & Type II errors.
  5. a) What is linear programming?  
b) How is LPP applied in transportation problem?  
c) List down the advantages of network techniques.
  6. a) Define operation research?  
c) Compare Iconic and analogue operation research model.  
d) Which are the prominent tools in O.R?

[4x9= 36 marks]

### Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) The life time of electric bulbs for a random sample of 10, from a large consignment gave the following data.

|                     |     |     |     |     |     |     |     |     |     |     |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Item:               | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
| Life in '000 hours: | 4.2 | 4.6 | 3.9 | 4.1 | 5.2 | 3.8 | 3.9 | 4.3 | 4.4 | 5.6 |

Can we accept the hypothesis that the average life of bulb is 4000 hours?

**Or**

b) In a bolt factory, machines  $M_1$ ,  $M_2$ ,  $M_3$  manufacture respectively 25, 35 and 40 percent of the total output. Of their output 5, 4 and 2 percent respectively, are defective bolts. One bolt is drawn at random from the product and is found to be defective. What is the probability that it is manufactured in the machine  $M_2$ ?

8. a) A firm proposes to purchase some fans and sewing machines. It has only Rs.5760 to invest and

a space for at most 20 items. A fan costs Rs.360 and a sewing machine Rs. 240. Profit expected from a fan is Rs.22 and from a sewing machine is Rs. 18. Using graphic method of solution determine the number of fans and sewing machines, he should purchase to maximize his profit. Also, ascertain the maximum possible profit he can earn.

**Or**

b) A small maintenance project consists of the following jobs whose precedence relationships are given below:

| Job                 | 1-2 | 1-3 | 2-3 | 2-5 | 3-4 | 3-6 | 4-5 | 4-6 | 5-6 | 6-7 |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Duration:<br>(days) | 15  | 15  | 3   | 5   | 8   | 12  | 1   | 14  | 3   | 14  |

- i) Construct a network diagram.
- ii) Find the total float for each activity.
- iii) Find the critical path and the total project duration.

**[2x12=24 marks]**

**COM1C02**

Reg. No.....

*Model Question Paper*

Name.....

**First Semester M. Com. Degree Examinations, November 2014****COMIC03 –MANAGEMENT INFORMATION SYSTEM****Time: 3 Hours****[Max. 60 Marks]****Section A**Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) What is M.I.S?  
b) Define MIS?  
c) What are the characteristics of MIS?
2. a) What is office automation?  
b) What are the different areas of office automation?  
c) What are the potential risks of information system?
3. a) What is data?  
b) Differentiate between Data and Information.  
c) Explain the Mathematical definition of information.
4. a) What is a system?  
b) What is system analysis? Why is it initiated?  
c) Explain the components of Structured System Analysis
5. a) What is system implementation?

- b) What are the physical components of MIS?
- c) Explain the steps involved in system implementation?
6. a) What is data communication and networking?
- b) What are the different kinds of networking?
- c) What is WWW? Explain how it works.

[4x9= 36 marks]

### Section B

Answer the two questions in this Section.

Each question carries 12 marks.

7. a) What is Business Data Processing? Explain the steps in Data Processing
- OR
- b) Define MIS, identify its components and describe its characteristics.
8. a) Explain data and information. What is data reduction? What are the methods of data reduction?
- OR
- b) Explain the latest trends in information technology

[2x12=24 marks]

Reg. No.....

*Model Question Paper*

Name.....

## First Semester M. Com. Degree Examinations, November 2014

### COMIC04 – ORGANIZATIONAL BEHAVIOUR

Time: 3 Hours

[Max. 60 Marks]

### Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)



1. Define Organisation Behaviour. State the significance of OB. What are the challenges and opportunities for OB.
2. What is motivation? Describe the process of motivation. How does the Mc Gregor's theory influence management decision making process in an organisation?
3. Explain organisational change. State the factors affecting change. Resistance to change is often viewed negatively, discuss some possible benefits of resistance to change in an organisation.
4. What is a group? Describe the types of group. Assume that you are to be placed in charge of a student group in the class, outline the key action steps you will take to make sure that the group develops into a real team.
5. What are ulterior transactions? Describe some of the major sources of inter-personal conflict? Which do you think is most relevant in today's organisation?
6. What is personality? What are its determinants? In your view which personality theory has greatest practical application. Why?

**[4x9= 36 marks]**

### Section B

Answer the two questions in this Section.

Each question carries 12 marks.

7. a) Compare and contrast Maslow's need hierarchy theory of motivation with Herzberg's two factors theory of motivation.

OR

- b) State the meaning of OD. Give an account of OD interventions.

8. a) What is perception? Describe the factors influencing perceptual mechanism.

OR

- b) What is conflict? Explain the various forms of conflicts that occur within an organisation.

**[2x12=24 marks]**

Reg. No.....

*Model Question Paper*

Name.....

**First Semester M. Com. Degree Examinations, November 2014**

**COMIC05 – ACCOUNTING FOR BUSINESS DECISIONS**

Time: 3 Hours

[Max. 60 Marks]

**Section A**Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) What is responsibility centre?  
 b) Explain i) programme budgeting and ii) participative budgeting.  
 c) The following data relate to a company which had a profit plan approved for selling 5000 units per month at an average selling price of Rs.10 per unit. The budgeted variable cost of production was Rs. 4 per unit and fixed cost were budgeted at Rs.20000, planned income being Rs. 10000 per month. Because of shortage of raw material, the plant could produce only 4000 units and the cost of production was increased by 0.50 per unit. Consequently the selling price was raised by Re. 1 per unit. To modify production processes in order to meet material shortage, the company incurred an expenditure of Rs1000 in research and development. Set out a performance budget and a summary report.
  
2. a) Define capital rationing.  
 b) Describe the steps in capital budgeting.  
 c) A company is considering an investment proposal to purchase a machine costing Rs. 2,50,000. The machine has a life expectancy of 5 years and no salvage value. The company tax rate is 40%. The firm uses straight line method of providing depreciation. The estimated cash flows before tax after depreciation from the machine are as follows.

| Year | Cash flow(Rs.) |
|------|----------------|
| 1    | 60,000         |
| 2    | 70,000         |
| 3    | 90,000         |
| 4    | 1,00,000       |
| 5    | 1,50,000       |

Calculate (a) Pay back period (b) ARR (c) Net Present Value and (d) Profitability Index at 10% discount rate.

Note:

| Year              | 1     | 2     | 3     | 4     | 5     |
|-------------------|-------|-------|-------|-------|-------|
| P V Factor at 10% | 0.909 | 0.826 | 0.751 | 0.683 | 0.621 |

3. a) Define cost of capital

b) State the importance of cost of capital.

c) Calculate cost of capital in the following cases.

i) X Ltd issues 12% debentures of the face value Rs.100 each and realizes Rs.95 per debenture. The debentures are redeemable after 10 years at a premium of 10%.

ii) Y Ltd issues preference shares of face value Rs. 100 each carrying 14% dividend and he realizes Rs. 92 per share. The shares are repayable after 12 years at par.

Note: both companies are paying income tax at 50%.

4. a) What is decision tree analysis?

b) Write brief notes on 'risk' and 'return'.

c) The Globe Manufacturing Company Ltd is considering an investment in one of the two mutually exclusive proposals - Project X and Y, which requires cash outlays of Rs. 3,40,000 and Rs.3,30,000 respectively. The Certainty Equivalent Approach is used in incorporating risk in capital budgeting decisions. The current yield on Government bonds is 8% and this be used as the risk less rate. The expected net cash flows and their certainty equivalents (CE) are as follows.

| Year – end | Project X   |     | Project Y   |     |
|------------|-------------|-----|-------------|-----|
|            | Cash inflow | C E | Cash inflow | CE  |
| 1          | 180000      | 0.8 | 180000      | 0.9 |
| 2          | 200000      | 0.7 | 180000      | 0.8 |
| 3          | 200000      | 0.5 | 200000      | 0.7 |

Present value factors of Re.1 discounted at 8% at the end of year 1, 2 and 3 are .926, .857 and .794 respectively.

Required

(a) Which project should be accepted?

(b) If risk adjusted discount rate method is used, which project would be analysed with a higher rate?

5. a) Define management accounting.

b) Explain the objectives of management accounting.

c) Evaluate how management accounting is useful to the decision makers.

6. a) What is responsibility accounting?

b) Explain the use of social and government accounting in business decision.

d) Critically examine the new trends in accounting.

**[4x9= 36 marks]**

COM1C05

Page-3

**Section B**

Answer the two questions in this Section.

Each question carries 12 marks.

7.a) A company is considering an investment proposal to purchase a machine costing Rs. 2,50,000. The machine has a life expectancy of 5 years and no salvage value. The company tax rate is 40%. The firm uses straight line method of providing depreciation. The estimated cash flows before tax after depreciation from the machine are as follows.

| Year | Cash flow(Rs.) |
|------|----------------|
| 1    | 60,000         |
| 2    | 70,000         |
| 3    | 90,000         |
| 4    | 1,00,000       |
| 5    | 1,50,000       |

Calculate (a) Pay back period (b) ARR (c) Net Present Value and (d) Profitability Index at 10% discount rate.

Note:

| Year              | 1     | 2     | 3     | 4     | 5     |
|-------------------|-------|-------|-------|-------|-------|
| P V Factor at 10% | 0.909 | 0.826 | 0.751 | 0.683 | 0.621 |

**OR**

b) The following information has been extracted from the balance sheet of Fashions Ltd as on 31-3-2013. (Rs.in lakhs)

|                 |             |
|-----------------|-------------|
| Equity          | 400         |
| 12% debentures  | 400         |
| Term Loan (18%) | <u>1200</u> |
| Total           | <u>2000</u> |

- Determine the weighted average cost of capital of the company. It has been paying dividend at a consistent rate of 20% pa.
- What difference will it make if the current price of the Rs.100 share is Rs.160?
- Determine the effect of income tax on the cost of capital under both premises (Assume Tax 50%)

8. a) Explain Zero base budgeting. State the process and advantages. Also explain how it differs from traditional budgeting.

**OR**

b) A company is considering two mutually exclusive projects X and Y. project X costs Rs.30000 and Project Y costs Rs. 36000. Given below is the Net Present Value profitability distribution for each project.

Project X

Project Y

| NPV Estimate | Profitability | NPV Estimate | Profitability |
|--------------|---------------|--------------|---------------|
| 3000         | 0.1           | 3000         | 0.2           |
| 6000         | 0.4           | 6000         | 0.3           |
| 12000        | 0.4           | 12000        | 0.3           |
| 15000        | 0.1           | 15000        | 0.2           |

- i) Compute the expected net present value of Project X and Y.
- ii) Compute the risk attached to each project, ie, standard deviation of each profitability distribution.
- iii) which project do you consider more risky and why?

[2x12=24 marks]

**COM1C05**

Reg. No.....

*Model Question Paper*

Name.....

## Second Semester M. Com. Degree Examinations, April 2015

### COM2C06 – STRATEGIC MANAGEMENT

**Time: 3 Hours**

**[Max. 60 Marks]**

### Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

2.
  - a) What do you understand by 'mission'?
  - b) Differentiate between conventional decision making and strategic decision making.
  - c) Discuss the various levels at which strategy operate.
3.
  - a) What is SWOT Analysis?
  - b) Compare and contrast between General Environment and Relevant Environment.
  - c) What is ETOP? How is a summary ETOP prepared? Illustrate.
4.
  - a) What are business level strategies?
  - b) Interpret the interface between business level strategies and corporate level strategies.
  - c) Discuss Michael Porter's approach to defining generic competitive strategies.

5.
  - a) What is the use of Gap Analysis?
  - b) List the contents of a typical Strategic Plan.
  - c) Discuss the strategic implications of each of the following types of business in a corporate portfolio: (i) Stars, (ii) Question Marks, (iii) Cash Cows, and (iv) Dogs.
  
6.
  - a) Why is leadership implementation relevant in strategic management?
  - b) Discuss the approaches to create a strategy supportive culture in business organizations.
  - c) Suggest some practical steps that strategists can take to make strategic use of politics and power mechanism in organizations.

**[4x9= 36 marks]**

**Page-2**

### **Section B**

Answer the *two* questions in this Section.

Each question carries 12 marks.

7.
  - a) Describe the scheme of grand strategies operating at the corporate level as proposed by William F. Glueck.

OR

  - b) Discuss the nature and importance of strategic evaluation and control. What are four major types of strategic control typically adopted by organizations?
  
8.
  - a) Strategy formulation is not entirely an analytical process, but it takes into account the non-analytical or subjective factors too." Discuss.

OR

  - b) Define strategic management. Schematically discuss the different phases of strategic management process.

**[2x12=24 marks]**

COM2C06

Reg. No.....

*Model Question Paper*

Name.....

**Second Semester M. Com. Degree Examinations, April 2015**

**COM2C07 – RESEARCH METHODOLOGY AND COMPUTER APPLICATION**

**Time: 3 Hours**

**[Max. 60 Marks]**

**Section A**

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) Define Research.

- b) What is Social research? State its objectives.
- c) Differentiate between Induction and Deduction methods of research.
2.
    - a) What is meant by Research Problem?
    - b) State the requisites of a good research problem.
    - c) Distinguish between pure and applied research.
  3.
    - a) What is Research Design.
    - b) Explain the importance of Research design.
    - c) What are exploratory research designs? Explain the methods used for such designs.
  4.
    - a) What is a research report?
    - b) How are computers used as a tool in research?
    - c) Describe the qualities of a good research report.
  5.
    - a) What are non-parametric test?
    - b) State the advantages of non-parametric test.
    - c) Explain one tailed and two tailed test.
  6.
    - a) What do you mean by Analysis of Variance?
    - b) State the various assumptions of Analysis of Variance?
    - c) What are the uses of Chi-square test?

[4x9= 36 marks]

**Page-2**

**Section B**

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) The following figures relate to production in kilogram of three varieties of wheat sown in 12 plots

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| A: | 14 | 16 | 18 |    |    |
| B: | 14 | 13 | 15 | 22 |    |
| C: | 18 | 16 | 16 | 19 | 20 |

Is there any significant difference in the production of the three varieties?

**OR**

b) Eight coins were tossed 256 times. The results obtained are given below. Test whether the coins are unbiased.

|               |   |    |    |    |    |    |    |   |   |
|---------------|---|----|----|----|----|----|----|---|---|
| No. of Heads: | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7 | 8 |
| Frequency:    | 2 | 10 | 25 | 50 | 75 | 58 | 21 | 9 | 6 |



8. a) In a certain a district A, 450 persons were considered regular consumers of tea out of a sample of 1000 persons. In another district B, 400 were regular consumers of tea out of a sample of 800 persons. Do these figures reveal a significant difference between the two districts as far as tea drinking habit is concerned?

**OR**

b) Define Research. Explain the various steps in Research Process.

**[2x12=24 marks]**

**COM2C07**

Reg. No.....

*Model Question Paper*

Name.....

## **Second Semester M. Com. Degree Examinations, April 2015**

### **COM2C08 – COSTING FOR MANAGEMENT DECISIONS**

**Time: 3 Hours**

**[Max. 60 Marks]**

#### **Section A**

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) What is Differential Costing?
- b) Distinguish between Differential Costing and Marginal Costing.
- c) State the areas of application of Differential Costing.

2. a) What is Value Analysis?  
 b) Distinguish Value Analysis and Value organizing.  
 c) What are the advantages of Value Analysis?
3. a) Define Cost of Capital.  
 b) Explain the importance of the concept of Cost of Capital in Financial Management.  
 c) Explain the methods of calculation of Cost of Retained Earnings.
4. a) Define Margin of Safety.  
 b) What are the uses of margin of safety in decision making?  
 c) The following particulars relate to a Company for two periods:

| <u>Period</u> | <u>Sales</u> | <u>Profit</u> |
|---------------|--------------|---------------|
| I             | Rs.1,20,000  | Rs.9,000      |
| II            | Rs.1,40,000  | Rs.13,000     |

Assuming that the cost structure and Selling prices remain the same in the two periods, find

out: a) P.V. Ratio b) BEP Sales and c) Margin of Safety in two periods \_\_\_\_\_

5. a) What is weighted average cost of capital?  
 b) What are the different basis to calculate the weighted average?  
 c) Calculate the cost of equity capital in the following case:

A company issues equity shares of Rs.10/- each for public subscription at a premium of 20% . The company pays @ 5% as under writing commission on issue price. Expected rate of dividend by equity shares is 25%

6. a) What is meant by break-even analysis ?  
 b) What are the assumptions of Break-even analysis?  
 c) From the following information , find out the Break Even Point in units and sales value:

Budgeted output - 75,0000 Units  
 Fixed Expenses - Rs.5,00,000  
 Variable Expenses per unit – Rs.10  
 Selling price per unit - Rs.20

[4x9= 36 marks]

## Section B

Answer the two questions in this Section.

Each question carries 12 marks.

- 7 .a) What is reporting? Discuss the various functions of reporting. What are the contents of a good report?

**OR**

- b) What is cost reduction? What are the areas of cost reduction? What are the techniques of cost reduction?

- 8.. a) In a Factory the budgeted and actual figures of the cost of material and direct labour

Incurred in the production during the month of January are the following:

|                                  | <u>Actual</u>  | <u>Budgeted</u> |
|----------------------------------|----------------|-----------------|
| Units of finished goods produced | 90,000 Units   | 1,00,000 Units  |
| Material Units                   | 1,82,000 Units | 2,00,000 Units  |
| Cost of Material per unit        | Re.0.52        | Re.0.50         |
| Total Cost of materials          | Rs.94,640      | Rs.1,00,000     |
| Direct Labour Hours              | 47,000         | 50,000          |
| Wage Rate                        | Rs.2.10p/hr    | Rs.2.00p/hr     |
| Total direct Labour cost         | Rs.98,700      | Rs.1,00,000     |

You are required to make an analysis of material and labour variance and verify these with total cost variances.

**OR**

- b) A Company's Flexible Budget at various levels of production reveals the following :

| <u>Output in<br/>000 Units</u> | <u>Selling price<br/>per unit</u> | <u>Total Semi.<br/>Fixed cost</u> | <u>Total Variable<br/>Cost in 000</u> | <u>Total Fixed<br/>in 000</u> |
|--------------------------------|-----------------------------------|-----------------------------------|---------------------------------------|-------------------------------|
| 30                             | 24                                | 150                               | 418                                   | 142                           |
| 60                             | 22                                | 150                               | 818                                   | 142                           |
| 90                             | 20                                | 170                               | 1278                                  | 142                           |
| 120                            | 18                                | 170                               | 1579                                  | 142                           |
| 150                            | 16                                | 200                               | 1778                                  | 142                           |
| 180                            | 14                                | 200                               | 1902                                  | 142                           |

You are required to :

- Prepare a schedule of total differential cost and increment in revenue.
- At what interest level should the company set its level of production?
- What selling price is recommended by you, in order to maximize the products

**[2x12=24 marks]**

**COM2C08**

Name.....

## Second Semester M. Com. Degree Examinations, April 2015

### COM2C09 – ADVANCED BUSINESS ACCOUNTING

Time: 3 Hours

[Max. 60 Marks]

#### Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) What is Asset backing method ?
- b) What are the needs for valuation of Shares?
- c) On 31<sup>st</sup> December 2012 the Balance Sheet of a limited company disclosed the following position.

| Liabilities                   | Rs.           | Assets         | Rs.           |
|-------------------------------|---------------|----------------|---------------|
| Issued Capital in Rs.10 share | 400000        | Goodwill       | 40000         |
| Reserves                      | 90000         | Fixed Assets   | 500000        |
| Profit & Loss Account         | 20000         | Current Assets | 200000        |
| 5% Debentures                 | 100000        |                |               |
| Current Liabilities           | <u>130000</u> |                |               |
|                               | <u>740000</u> |                | <u>740000</u> |

On 31<sup>st</sup> December 2012 the Fixed Assets were valued at Rs.550000 and Goodwill at Rs.50000. Compute the value of Shares by Asset backing method.

2. a) What is GAAP ?
- b) State the need for Accounting Standards.
- c) Explain Accounting Standard Board .
3. a) What is cum-interest.?
- b) Distinguish between cum- interest and ex- interest transaction.
- c) On 1<sup>st</sup> July 2012 , Madhura Investment Ltd. held Rs. 100000,6% Debentures of Gerald Ltd. which appeared in the books at Rs.96500. Interest is payable on 31<sup>st</sup> July and 31<sup>st</sup> January. On October 1, 2012 a further Rs.50000 Debentures in Gerald Ltd. were bought at Rs.98 cum interest and on January, 1, 2013,a further Rs.30000 Debentures were bought at Rs.97 ex- interest. On 31<sup>st</sup> March 2013, Rs.80000 Debentures were sold at Rs.101 cum interest and on 1<sup>st</sup> June Rs. 60000 Debentures were sold at Rs.102 ex interest. Show investment Account for the period ending 30<sup>th</sup> June 2013.
4. a) What is COSA?
- b) Explain the features of CCA Method.
- c) The Balance Sheet of J Ltd. disclosed the following:

|                       | January 1, 2012 | December 31, 2012 |
|-----------------------|-----------------|-------------------|
|                       | Rs.             | Rs.               |
| Trade Debtors         | 200000          | 260000            |
| Advances to Suppliers | 60000           | 80000             |
| Trade Creditors       | 150000          | 160000            |
| Index Number          | 100             | 120               |
| Average for the year  | 110             |                   |

Calculate Monetary Working Capital Adjustment.

**Page-2**

5. a) Define Human Resource Accounting.  
 b) State the limitations of Human Resources Accounting.  
 c) Explain the different methods of evaluating Human Assets..
- 6.a) What is Public Account?  
 b) What are the objectives of Government Accounting?  
 c) Distinguish between Government Accounting and Commercial Accounting.

**[4x9= 36 marks]**

**Section B**

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) The premises of a Company was destroyed by fire which took place on 1<sup>st</sup> March,2012,and as a result of which the business was disorganized from 1<sup>st</sup> March to 31<sup>st</sup> July ,2012. Accounts are closed on 31<sup>st</sup> December every year. The company is insured under a loss of profit policy for Rs.750000. The period of indemnity specified in the policy is 6 months. From the following information, you are required to compute the amount of claim under the loss of profit policy.

|                              | Rs.      |
|------------------------------|----------|
| Turnover for the year 2011   | 40 00000 |
| Net profit for the year 2011 | 240000   |
| Insured standing charges     | 480000   |
| Uninsured standing charges   | 80000    |

Turnover during the period of dislocation (from 1-3-2012 to 31-7-2012) 800000

Standard turnover for the corresponding period in the preceding year

ie. from 1-3-2011 to 31-7-2011 20,00000

Annual turnover for the year immediately preceding the fire (ie from

1-3-2011 to 28-2-2012 44.00000

Increased cost of working 150000

Savings in insured standing charges 30000

Reduction in turnover avoided through increased working cost 400000

Owing to reason acceptable to the insurer, the special circumstance clause stipulates for:

- i) Increase of turnover (standard and annual) by 10% (ii) Increase of rate of Gross profit by 2%.

**OR**

b) On 31<sup>st</sup> December 2012, the Balance Sheet of a limited company reveals the following position.

| <b>Liabilities</b>                    | Rs.           | <b>Assets</b>           | Rs.           |
|---------------------------------------|---------------|-------------------------|---------------|
| Share capital in shares of Rs.10 each | 400000        | Goodwill                | 40000         |
| General Reserve                       | 190000        | Fixed Assets (Tangible) | 500000        |
| Profit & Loss Account                 | 120000        | Current Assets          | 400000        |
| 14% Debentures                        | 100000        |                         |               |
| Current Liabilities                   | <u>130000</u> |                         |               |
|                                       | <u>940000</u> |                         | <u>940000</u> |

**COM2C09**

**Page-3**

On the above mentioned date, the tangible Fixed Assets were independently valued at Rs.350000 and Goodwill at Rs.50000. The net profits for the three years were : 2009- Rs.103200 ; 2010- Rs.104000; and 2011- Rs. 103300 of which 20% was placed to General Reserve , this proportion being considered reasonable in the industry in which the company is engaged and were a fair return on investment may be taken at 18%. Compute the value of Shares by (i) yield value method and (ii) earning capacity method.

8. a) The income statement for the year ended 31<sup>st</sup> December ,2012 and the Balance Sheet of R Ltd. as on 1<sup>st</sup> January 2012 are as follows:

Income Statement for the year ended 31<sup>st</sup> December 2012

|                     | Rs. | Rs.    |
|---------------------|-----|--------|
| Sales               |     | 150000 |
| Cost of Goods Sold: |     |        |

|                                  |              |              |
|----------------------------------|--------------|--------------|
| Opening Stock (FIFO)             | 30000        |              |
| Purchases                        | <u>60000</u> |              |
| Cost of Goods available for Sale | 90000        |              |
| Less: Closing Stock (FIFO)       | <u>10000</u> | <u>80000</u> |
| Gross Profit on Sales            |              | 70000        |
| Operating Expenses               | 20000        |              |
| Depreciation                     | 10000        |              |
| Interest on Loan                 | <u>5000</u>  | <u>35000</u> |
| Retained Earnings                |              | <u>35000</u> |

Balance Sheet as on 1<sup>st</sup> January 2012

| Liabilities   | Rs.           | Assets            | Rs.           |
|---------------|---------------|-------------------|---------------|
| Share Capital | 100000        | Plant & Machinery | 100000        |
| Bank Loan     | 25000         | Stock             | 30000         |
| Creditors     | 35000         | Debtors           | 18000         |
|               |               | Cash              | <u>12000</u>  |
|               | <u>160000</u> |                   | <u>160000</u> |

Debtors and Creditors balances remained constant throughout the year. General price indices were as given below: On 1<sup>st</sup> January 2012: 200; Average for the year: 240; On 31<sup>st</sup> December 2012: 300. You are required to prepare the Final Accounts for the year 2012 after adjusting price level changes under CPP Method.

**OR**

b). S.S.Himalaya set out on a voyage from Kolkatta to Mumbai. On December 31<sup>st</sup>, on which date the accounts are to be closed, the return voyage had not been completed. The details of the entire voyage to Mumbai and back to Kolkatta completed after 31<sup>st</sup> December were:

Freight Rs.400000: Coal consumption Rs. 70000: Stores Consumed Rs. 30000: Port charges Rs. 15000: Salaries of the Crew Rs. 40000: Insurance (ship) Rs. 20000: Insurance (freight) Rs. 8000: Primage 10%: Address commission 5%: Only Rs. 150000 freight was available on the return journey. Prepare the Voyage Account up to 31<sup>st</sup> December.

**[2x12=24 marks]**

**COM2C09**

Reg. No.....

*Model Question Paper*

Name.....

## Second Semester M. Com. Degree Examinations, April 2015

### COM2C10 – FINANCIAL MANAGEMENT

Time: 3 Hours

[Max. 60 Marks]

#### Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1.a) Define Financial Management

b) “Wealth Maximisation is superior criteria than profit Maximisation” Explain.

c) X needs Rs.10,00,000 for expansion. The expansion is expected to yield an annual EBIT of Rs.1,60,000. In choosing a financial plan, X Ltd’, has an objective of maximising EPS. It is considering the possibility of issuing Equity shares and raising Debt of Rs.1,00,000 or Rs.4,00,000 or Rs.6,00,000, The current market price per share is Rs.25 and is expected to drop to Rs.20 if the funds borrowed in excess of Rs.5,00,000. Funds can be borrowed at the rates indicated below:

a) Up to Rs.1,00,000 @ 8%

b) Over Rs.1,00,000 – Rs.5,00,000 @ 12%

c) Over Rs.5,00,000 @ 18%

Assume a tax rate of 50%. Determine the EPS for the three financing alternatives.

2. a)What is Combined Leverage ?

b) Distinguish between operating Leverage & Financial Leverage.

c) A Company has sales of Rs.50,000. Variable costs are 40% of sales. Whereas, the fixed operating costs are Rs.15000. The amount of interest payable on long term debt is Rs.5,000. Find out the combined leverage and illustrate its impact of the company’s taxable income if sales incre by 5%

3. a) What is optimum capital structure?

b) Explain NOI Theory of capital structure.

c) The expected EBIT of a company is Rs.2,75,000. The rate of equity capitalisation (Ke) is 20%. The Company has bonds of Rs.5,00,000 carrying 15% annual rate of interest. On the basis of the above data compute :-

1) The existing total market value (V) and the overall cost of capital (Ko) of the Company.

2) The impact on V on Ko, if the management takes a decision to increase debt by

Rs.2,00,000

3) The impact on V and Ko in case the management decides to reduce its debt by

Rs.2,00,000

4. a) What is Stable Dividend Policy?

b) What is “Arbitrage Process”? Explain.

c) What are the factors influencing Dividend Policy? Explain.



5. a) Define working capital.

b) What are the drawbacks of redundant working capital?

c) The Hindustan Chemicals belong to a risk class for which the appropriate capitalisation rate is 10%. It currently has 1,00,000 shares selling at Rs.100 each. The firm is intending the declaration of Rs.5 as dividend at the end of the current financial year, which has just begun. What will be the price of the share at the end of the year if a dividend is not declared? What it will be if one is getting dividend? Answer these on the basis of M-M Model and assume no taxes.

6. a) What do you mean by “operating cycle”?

b) What are the costs associated with investment in Sundry Debtors?

c) A firm’s current credit sales are Rs.12,00,000 p.a. The firm is considering of lowering its credit standard (liberalising the credit policy) which will result in slowing the ACP from 1 month to 2 months. This relaxation is expected to increase sales by 20% The firm’s RRR is 15%. At the existing level of sales the producing and selling cost is 90% of sales while the variable selling cost of incremental sales will be 70% of sales. Should the firm relax its credit policy?

[4x9= 36 marks]

## Section B

Answer the two questions in this Section.

Each question carries 12 marks.

7. a) Calculate the degree of operating Leverage, Financial Leverage and combined Leverage for the following firms and interpret the results

|                    | P        | Q        | R        |
|--------------------|----------|----------|----------|
| Out put in Units   | 3,00,000 | 75,000   | 5,00,000 |
|                    | Rs.      | Rs.      | Rs.      |
| Fixed Cost         | 3,50,000 | 7,00,000 | 75,000   |
| Unit Variable Cost | 1.5      | 7.5      | 0.10     |
| Interest Expenses  | 25,000   | 40,000   | -        |
| Unit Selling Price | 3.00     | 25.00    | 0.50     |

**OR**

b) Explain the Theories of Capital Structure.

8. a) The following information is available in respect of a firm:

$$K_e = 10\%; \text{EPS} = \text{Rs.}50$$

Assumed rate of return on investments:-

- 1) 12%    2) 8%    3) 10%

Show the effect of dividend policy on market price of shares applying Waters' Formula, when, Dividend payout ratio is 0%, 20%, 40%, 80% and 100%

**OR**

b). The following data have been extracted from the books of ABC Ltd.

|                       | <u>Rs. Per. Unit</u> |
|-----------------------|----------------------|
| Cost of raw materials | 500                  |
| Cost of direct labour | 160                  |
| Cost of over heads    | <u>320</u>           |
| Total Cost            | 980                  |
| Profit                | <u>220</u>           |
| Selling Price         | <u>1200</u>          |

The following additional information is also given:

- 1) The average storage period for raw material is 1 month.
  - 2) The average period for work-in-progress in production department is  $\frac{1}{2}$  month.
  - 3) The average storage period for finished goods is 1 month.
  - 4) The Co., is given 1 month credit facility by its suppliers for its purchases, whereas the Co., sells goods on 2 months credit to its customers
  - 5) The time lag for payment of wages is  $1\frac{1}{2}$  weeks and overhead is 1 month.
  - 6) 20% of total output is sold in cash basis.
  - 7) The average level of cash in business is expected to remain at Rs.1,50,000.
- Assuming 1 month = 4 weeks prepare an estimate of total working capital requirements for the Company for a volume of 13,000 Units of production, taking debtors at cost price.

**[2x12=24 marks]****COM2C10**

Reg. No.....

*Model Question Paper*

Name.....

**Third Semester M. Com. Degree Examinations, November 2015****COM3C11 – MARKETING MANAGEMENT****Time: 3 Hours****[Max. 60 Marks]****Section A**Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. (a) Explain the concept of marketing.  
(b) What do you mean by social marketing?  
(c) Discuss the various bases of market segmentation.
  
2. (a) Define the concept of Buying Behaviour.  
(b) Why buying behaviour is desirable to study in marketing?  
(c) When an individual is member of several peer groups, are his consuming activities likely to be affected by all groups? Explain.
  
3. (a) What is a product?  
(b) What do you understand by product planning? Explain its significance.  
(c) Elucidate the various phases of PLC.
  
4. (a) What is meant by skimming the cream price policy?  
(b) Discuss the factors affecting pricing decisions.  
(c) Describe the three bases on which firms usually set their pricing in practice. Illustrate them.
  
5. (a) Define market segmentation.  
(b) "Target market follows market segmentation." Discuss.  
(c) Discuss the significance of market segmentation in India.
  
6. (a) Define salesmanship.  
(b) What are the essentials of effective selling.  
(c) "Salesmen are born and not made." Discuss.

[4x9= 36 marks]

**Section B**

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) Define the concept of promotion mix. What are its elements? What are the determinants of promotion mix?

*OR*

b) "Concentration, equalization, and dispersion are the soul of marketing." Discuss.

8. a) Discuss the key challenges that a marketer faces while entering into Indian rural markets.

*OR*

b) Elucidate the factors that are to be considered in the selection of media for advertising.

[2x12=24 marks]

COM3C11

Reg. No.....

*Model Question Paper*

Name.....

**Third Semester M. Com. Degree Examinations, November 2015**

**COM3C12 – CORPORATE ACCOUNTING**

Time: 3 Hours

[Max. 60 Marks]

**Section A**

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) What is amalgamation?

b) State the conditions to be satisfied to constitute “amalgamation in the nature of merger”

c) On 1<sup>st</sup> April 2012, A Ltd. and B Ltd. were amalgamated into C Ltd. on the basis of the following Balance sheets and other information:

| (Rs. in lakhs )                |             |             |                   |             |             |
|--------------------------------|-------------|-------------|-------------------|-------------|-------------|
| Liabilities                    | A Ltd.      | B Ltd.      | Assets            | A Ltd.      | B Ltd.      |
| Equity shares of Rs.100 each   | 800         | 750         | Land& Building    | 550         | 400         |
| 12% Pref. Shares of Rs.100each | 300         | 200         | Plant& Machinery  | 350         | 250         |
| General reserve                | 300         | 250         | Investments       | 150         | 50          |
| Investment Allowance Reserve   | 70          | 50          | Stock in Trade    | 350         | 250         |
| Profit& Loss Account           | 50          | 30          | Debtors           | 250         | 300         |
| 10% Debentures of Rs.100 each  | 60          | 30          | Bills Receivables | 50          | 50          |
| Creditors                      | 270         | 120         | Cash & Bank       | 300         | 200         |
| Bills Payable                  | <u>150</u>  | <u>70</u>   |                   |             |             |
|                                | <u>2000</u> | <u>1500</u> |                   | <u>2000</u> | <u>1500</u> |

Additional information :- 1) 10% Debentures of A Ltd. & B Ltd. were discharged by C Ltd. issuing such number of its 15% Debentures of Rs. 100 each so as to maintain the same amount of interest. (2) Pre. Share holders of the two companies are issued equivalent number of 15% Pre. Shares of C Ltd. at a price of Rs.150 per share (face value Rs.100) (3) C Ltd. will issue 5 equity shares for each equity share of A Ltd. and 4 equity shares for each equity share of B Ltd. The shares are to be issued @Rs. 30 each, having a face value of Rs. 10 per share. (4) Investment allowance Reserve is to be maintained for 4 more years. Prepare Balance Sheet of C Ltd. after the amalgamation has been carried out.

2. a) What is Liquidation ?

b) What are the grounds for compulsory winding up?

c) LT Ltd. went into liquidation with the following Liabilities.

Secured Creditors      Rs. 40000      (securities realized Rs. 50000)

Pref. Creditors – Rs. 1200, Unsecured Creditors –Rs. 61000, Liquidation Expenses – Rs.500.

The Liquidator is entitled to a remuneration of 3% on the amounts realized (including securities in the hands of secured creditors) and 1.5% on the amount distributed to the unsecured creditors. The various assets (excluding the securities in the hands of the secured creditors) realized Rs.52000. Prepare Liquidators Final Statement of Account.

3. a) What is Double Account System ?

b) State the criticisms against Double Account system.

c) From the following particulars draw up Capital Account and General Balance Sheet as on 31<sup>st</sup> March 2013 on Double Account system .

Share Capital Rs.2600000; 11% Debentures Rs. 400000; Trade creditors Rs.160000; Reserves Rs.150000; Debtors Rs.380000; Cash in Hand & at Bank Rs.350000; Investments Rs.150000; Stock Rs. 240000;

Expenditure to 31<sup>st</sup> March 2012: Land Rs. 120000; Machinery Rs.1350000; Building Rs. 530000. The expenditure during the year ended 31<sup>st</sup> March 2013 was Land Rs.250000; Machinery Rs.250000; Building Rs. 100000. Renewal Fund Rs.250000 has been created. Balance of Net Revenue Account Rs.160000.

4. a) Define Holding Company.

b) How do you ascertain the amount of minority interest?

c) H Ltd. acquires  $\frac{3}{4}$  of the share capital of S Ltd. on 31<sup>st</sup> December 2013 . The Balance Sheet of the two companies are as under

| Liabilities                     | H Ltd.        | S Ltd.        | Assets           | H Ltd.        | S Ltd.        |
|---------------------------------|---------------|---------------|------------------|---------------|---------------|
|                                 | RS.           | Rs.           |                  | Rs.           | Rs.           |
| Share capital ( in Rs.10 share) | 200000        | 100000        | Fixed Assets     | 200000        | 100000        |
| General Reserve                 | 50000         | 30000         | Current Assets   | 130000        | 120000        |
| Profit& Loss Account            | 30000         | 20000         | Shares in S Ltd. | 100000        | --            |
| 10% Debentures                  | 100000        | 50000         |                  |               |               |
| Creditors                       | <u>50000</u>  | <u>20000</u>  |                  |               |               |
|                                 | <u>430000</u> | <u>220000</u> |                  | <u>430000</u> | <u>220000</u> |

You are required to prepare the consolidated Balance Sheet as on 31<sup>st</sup> December 2013.

5. a) What is Life Assurance Fund?

b) How does Valuation Balance Sheet differ from Normal Balance Sheet?

c) The Life Fund of a Life Assurance Company was Rs.8648000 on 1<sup>st</sup> December 2012. The interim bonus paid during the inter valuation period was Rs.148000. The periodical Actuarial Valuation determined the net liability at Rs. 7425000.Surplus brought forward from the previous valuation was Rs.850000. The Director of the company proposed to carry forward Rs.931000 & to divide the balance between the share holders and the policy holders in the ratio of 1:10.Show the Valuation Balance Sheet, Net profit for the valuation period& distribution of surplus.

6. a) What is Internal Reconstruction ?

b) Explain the procedure for reducing Share Capital.

c) The following was the Balance Sheet of Continental Construction Ltd. as on 31-12- 2012

| Liabilites | Rs. | Assets | Rs. |
|------------|-----|--------|-----|
|------------|-----|--------|-----|

|                                   |               |                           |               |
|-----------------------------------|---------------|---------------------------|---------------|
| Authorized Capital                |               | Goodwill                  | 10000         |
| 20000 equity shares of Rs.10 each | <u>200000</u> | Land& Building            | 20500         |
| Issued & paid up capital          |               | Machinery                 | 50850         |
| 12000 shares of Rs.10 each        | 120000        | Stock                     | 10275         |
| Less: calls in arrear             | <u>9000</u>   | Cash at bank              | 1500          |
| (Rs.3 per share on 3000 shares )  | 111000        | Debtors                   | 15000         |
| Creditors                         | 15425         | Preliminary Expenses      | 1500          |
| Provision for tax                 | 4000          | Profit& Loss A\C          |               |
|                                   |               | Balance as per last       |               |
|                                   |               | Balance sheet             | 22900         |
|                                   |               | Less; profit for the year | <u>2100</u>   |
|                                   |               |                           | <u>20800</u>  |
|                                   | <u>130425</u> |                           | <u>130425</u> |

The directors found that the Machinery was overvalued by Rs.10000. It is proposed to write down its asset to its true value & to extinguish the deficiency in Profit & loss account and to write off Goodwill & preliminary expenses by adopting the following scheme. (i) Forfeit the shares on which call is outstanding. (ii) Reduce the paid capital by Rs.3 per share (iii) Reissue the forfeited shares at Rs. 5 per share. (iv) Utilize the provision for tax, if necessary. You are required to draft journal entries.

[4x9= 36 marks]

### Section B

Answer the two questions in this Section.

Each question carries 12 marks.

7. a) On 31<sup>st</sup> March 2012 the following was the Balance sheet of Moon Ltd.

| Liabilities                          | Rs.            | Assets               | Rs.            |
|--------------------------------------|----------------|----------------------|----------------|
| 120000, equity shares of Rs. 10 each | 1200000        | Plant&Machinery      | 900000         |
| Capital reserve                      | 20000          | Furniture & Fittings | 150000         |
| Loan                                 | 360000         | Stock                | 400000         |
| Sundry Creditors                     | 300000         | Sundry Debtors       | 220000         |
|                                      |                | Cash at Bank         | 100000         |
|                                      |                | Profit&Loss A\C      | <u>110000</u>  |
|                                      | <u>1880000</u> |                      | <u>1880000</u> |

A new company Suraj Ltd. was incorporated which took over the Fixed assets & Stock of Moon Ltd. for Rs.1260000 payable as to Rs.900000 in the form of equity shares of Rs.5 each and 360000 in the form of 3600 ,12% mortgage Debentures of Rs.100 each . Loan creditors accepted the Debentures in Suraj Ltd.on discharging of the loan. Sundry debtors realized Rs.205000. Expenses of liquidation amounted to Rs.8000 and were met by Moon Ltd. The available cash was distributed among sundry creditors in full satisfaction of

their claims. Pass journal entries in the books of Suraj Ltd. and show important ledger accounts in the books of Moon Ltd. to close the books . Also show the initial Balance Sheet of Suraj Ltd.

**OR**

b) A Ltd. holds 80% of the share capital of B Ltd. & 70% of the share capital of C Ltd. At the date of acquisition of the shares ,the share holders funds of each of the two companies were as follows.

|                      | B Ltd. | C Ltd. |
|----------------------|--------|--------|
| Paid up capital      | 300000 | 160000 |
| Reserves             | 70000  | 20000  |
| Profit& Loss Account | 50000  | 30000  |

Extracts from the Balance sheet of all the companies as at 31-3-2012 were as under

|                     | A Ltd.         | B Ltd.        | C Ltd.                |                  | A Ltd.         | B Ltd.        | C Ltd.        |
|---------------------|----------------|---------------|-----------------------|------------------|----------------|---------------|---------------|
| Paid up capital     | 400000         | 300000        | 160000                | Stock            | 120000         | 95000         | 30000         |
| Reserves            | 150000         | 70000         | 20000                 | Debtors          | 100000         | 70000         | 50000         |
| P\L A\C (balance)   | 90000          | 20000         | 14000                 | P& M             | 280000         | 260000        | 220000        |
| Profit for the year | 120000         | 35000         | 26000                 | Debentures       | 20000          | -             | -             |
| Ended 30-6-2012     |                |               |                       | in C Ltd.at par  |                |               |               |
| Debenrtures         | 200000         | -             | 50000                 | Shares in B Ltd. | 400000         | -             | -             |
| Creditors           | 80000          | 30000         | 20000                 | Shares in C Ltd. | 140000         | -             | -             |
| advances 30000      | -              | 10000         | Intercompany advances |                  |                |               | Intercompany  |
|                     |                |               |                       | A Ltd.           | -              | 30000         | -             |
|                     |                |               |                       | C Ltd.           | 10000          | -             | -             |
|                     | <u>1070000</u> | <u>455000</u> | <u>300000</u>         |                  | <u>1070000</u> | <u>455000</u> | <u>300000</u> |

Additional information :- (i) included in the stock in trade at 31<sup>st</sup> March 2012 were goods acquired from associated company on which profits have been made by the respective companies as under :A Ltd. Goods from B Ltd. at Rs.6000 above cost ; B Ltd. – Goods from C Ltd. at Rs 4000 above cost ; C Ltd. – Goods from A Ltd. at Rs. 2000 above cost

(ii) A Ltd. purchased an item of Plant from B Ltd. on 30<sup>th</sup> September 2011 for Rs. 24000 on which the latter company had made a profit of Rs. 2400. Depreciation had been charged in the accounts of the purchaser at 10% per annum. (iii) Dividends were paid during the year as follows. : A Ltd. – at the rate of 10% per annum. , C Ltd. : at the rate of 10% per annum. out of the pre acquisition profits. : B Ltd. – at the rate of 10% per annum out of the pre acquisition profits. (iv) A Ltd. has included all dividends received during the year in its Profit & Loss account. You are required to prepare a consolidated Balance sheet of A Ltd. and its subsidiaries as at 31st March 2012.

8. (a) Following are the details regarding Unfortunate Ltd. which went into voluntary liquidation as on 31-12-2012.

|                                                               | Rs.               |
|---------------------------------------------------------------|-------------------|
| 3000 equity shares of Rs. 100 each, Rs.80 called up & paid up | 240000            |
| 6%,1000 Pre. Shares of Rs. 100 each fully paid up             | 100000            |
| Less calls in arrears (expected to realize in full)           | <u>5000</u> 95000 |



|                                                             |        |
|-------------------------------------------------------------|--------|
| 55 Debentures having a floating charge on the assets        | 100000 |
| (Interest paid up to 30 <sup>th</sup> June 2012)            |        |
| Mortgage on Land & Building                                 | 80000  |
| Trade Creditors                                             | 265500 |
| Wages outstanding                                           | 20000  |
| Secretary's Salary (@Rs.500 per month) outstanding          | 3000   |
| Managing Director's salary (@Rs.1500 per month) outstanding | 6000   |

| Assets                           | Book value | Expected to produce |
|----------------------------------|------------|---------------------|
|                                  | Rs.        | Rs.                 |
| Land & Building                  | 120000     | 130000              |
| Plant & Machinery                | 200000     | 130000              |
| Tools                            | 20000      | 4000                |
| Patent                           | 50000      | 30000               |
| Stock                            | 87000      | 74000               |
| Accounts receivables             | 90000      | 60000               |
| Investment (pledged with bank    | 180000     | 170000              |
| for an outstanding of Rs.190000) |            |                     |

On 31<sup>st</sup> December 2007, the Balance sheet of the company showed a General reserve of Rs. 40000 accompanied by a debit balance of Rs.25000 in Profit & loss account. In 2008, the company made a profit of Rs.40000 and declared a dividend of 10% on equity shares. The company suffered a total loss of Rs.109000 besides a loss of stock due to fire of Rs.40000 during 2009, 2010 & 2011. In 2012, loss of Rs.128800 was made. Prepare liquidators' statement of accounts & deficiency account.

### OR

(b) From the following particulars you are required to prepare Fire Revenue account for the year ended on 31<sup>st</sup> March 2013.

|                             | Rs.        |                                       | Rs.      |
|-----------------------------|------------|---------------------------------------|----------|
| Claims paid                 | 480000000  | Additional Reserve for unexpired risk | 20000000 |
| Claims Outstanding on       | 40000000   | Reinsurance recoveries of claims      | 8000000  |
| 15 <sup>th</sup> April 2012 |            | Sundry expenses regarding claims      | 5000000  |
| Claims intimated but not    |            | Loss on sale of Motor car             | 5000000  |
| accepted on 31-3-2013       | 10000000   | Bad debts                             | 3000000  |
| Claims intimated & accepted |            | Refund of Double Taxation             | 5000000  |
| but not paid on 31-3-2013   | 60000000   | Interest & dividend                   | 6000000  |
| Premium received            | 1212000000 | Income Tax deducted there from        | 1000000  |

|                                        |           |                                 |          |
|----------------------------------------|-----------|---------------------------------|----------|
| Reinsurance premium paid               | 120000000 | Legal expenses regarding claims | 30000000 |
| Commission                             | 200000000 | Profit on sale of investments   | 2000000  |
| Commission on reinsurance              | 100000000 | Depreciation on Furniture       | 6000000  |
|                                        |           | Rent of staff quarters deducted |          |
| Commission on reinsurance              | 5000000   | from salaries                   | 2000000  |
| accepted                               |           |                                 |          |
| Expenses of management                 | 317000000 |                                 |          |
| Reserve for unexpired risk on 1-4-2012 | 400000000 |                                 |          |

You are required to provide for additional reserve for unexpired risk at 1% of the net premium in addition to the opening balance.

**[2x12=24 marks]**

**COM3C12**

Reg. No.....

*Model Question Paper*

Name.....

## COM3C13- INCOME TAX LAW AND PRACTICE

Time: 3 Hours

Max. 60 Marks

## Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

- 1 a** What do you mean by Gross Total Income?
- b** Distinguish between capital expenditure and revenue expenditure for income tax purpose.
- c** Mr. John, a foreign national came to India for the first time on June 15, 2007. During the financial years 2007-08, 2008-09, 2009-10, 2010-11, 2011-12, and 2012-13, he stays in India for 120 days, 115 days, 15 days, 191 days, 124 days and 80 days respectively. Determine his residential status for the assessment year 2013-14.
- 2 a** What is perquisite?
- b** State provisions of the Income Tax Act 1961, relating to the taxability of House Rent Allowance.
- c** Mr. A has retired from a private company on 30<sup>th</sup> November, 2012. He was working since 1<sup>st</sup> March, 1986. He received Rs. 2,00,000 as gratuity. His salary grade was 5,000-100-8,000-200-15000, since 1<sup>st</sup> March, 2001. He was also getting D.A. @ 25% of Basic Salary. Calculate his exempted gratuity (a) if comes under Gratuity Act, (b) if he doesn't under Gratuity Act.
- 3 a** What do you mean by Block of Assets?
- b** Explain the provisions relating to the additional depreciation on plant and machinery.
- c** Sri. Shyam Lal is the owner of three houses. Compute his income from house property for the assessment year 2013-14:
- First House- Self-occupied for residence. Municipal value Rs.60000; Municipal tax Rs.12000 and interest on loan taken to purchase it on 1.5.2012 Rs.75000.
- Second House- Municipal value Rs.6500, let out at Rs.500 p.m. Local taxes Rs.500; Repairs Rs.100; Ground rent Rs.100 and collection charges Rs.600.
- Third house- Municipal value Rs.3000; used in his own business.
- All the above expenses have been paid.
- 4 a** What is Clubbing of Income?
- b** Distinguish between Short term Capital Gain and Long term Capital Gain.
- c** 'K' is the owner of a house property which he purchased in June, 1987for Rs.90000. He sold it for Rs.725000 on 15<sup>th</sup> May, 2012 and incurred an expenditure of Rs.10000 as brokerage. He bought a residential house on 15<sup>th</sup> January, 2013 for a sum of Rs.250000 and sold this house on 15<sup>th</sup> March, 2013 for a sum of Rs.300000 and paid a sum of Rs. 3000 as commission.

Compute the Capital gains chargeable for the Assessment Year 2013-14. Cost Inflation Index for 1987-88 is 150 and for 2012-13 is 852.

- 5 a** What is Bond washing transaction?
- b** State the circumstances in which the income of the wife of an assessee is included in his total income.
- c** Sri Anand has the following investments for the previous year ended 31.3.2013:
- i) 10% Rs.30000 tax-free Govt. securities.
  - ii) 10% Rs.40000 Karnataka Govt. loan.
  - iii) 10% Rs.36000 tax-free debentures (listed) of a company.
  - iv) 10% Rs.20000 debentures (listed) of a tea company.
  - v) Rs.7200 received as interest on debentures of a company (unlisted).
- He paid commission to his bank Rs.500 for collecting the above amounts.

Find out his taxable 'Income from interest on securities' for the assessment year 2013-14.

- 6 a** What is Agricultural income?
- b** Explain the procedure for the assessment of income.
- c** Calculate the amount of deduction u/s 80G:
- |                                                | Rs.    |
|------------------------------------------------|--------|
| i) Gross Total Income                          | 300000 |
| ii) Deduction u/s 80C to 80U (except 80G)      | 50000  |
| iii) Donations by cheques:                     |        |
| a) P.M. National Relief Fund                   | 30000  |
| b) Allahabad University – National eminence    | 20000  |
| c) Technology Development and Application Fund | 10000  |
| d) P. M. Drought Relief Fund                   | 10000  |
| e) Charitable Society                          | 10000  |
| f) Family Planning                             | 15000  |
| g) Sports Association                          | 20000  |

**[4x9= 36 marks]**

**Section B**

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. How residence of an assessee is determined for income tax purposes? Explain the incidence of tax on the basis residence.

**OR**

Sri. Pramod is employed in a firm at Mumbai. He is in the grade of Rs.4400-110-5400. 1<sup>st</sup> January, 2009. He gets Rs.5000 per month as dearness allowance and Rs.15000 as medical allowance. He has been provided with a furnished accommodation by the employer owned by it, of the estimated rental value of Rs.2000 p.m. Furniture costing Rs.13000 has also been provided by the employer. He has been given a small car, which is used by him for his purpose also. The driver's remuneration and all the expenses relating to the car are borne by the employer. He has been provided with the facility of a gardener, a watchman and a servant who are paid by the employer @ Rs. 200 p.m., Rs.1000 p.m., and Rs.600 p.m. respectively.

He contributes 15% of his pay and dearness allowance to the recognised Provident Fund towards which the employer contributes Rs.1200 p.m. Interest amounting to Rs.1980 has been credited on the balance of Rs.22000 standing to the credit of his Provident Fund Account.

Assuming that the salary becomes due on the first day of next month. Determine his salary income for the assessment year 2013-14.

8. Discuss the provisions regarding set-off and carry forward of losses under the Income Tax Act, 1961.

**OR**

From the following, compute the business income of Sri. Vinod for the year 2012-13:

| Income Statement             |        |                             |          |
|------------------------------|--------|-----------------------------|----------|
| To Bad debts                 | 7,000  | By Gross Profit             | 2,66,100 |
| „ Bad debts provision        | 1,500  | „ Interest from debtors     | 3,000    |
| „ Audit fees                 | 3,500  | „ Discount from creditors   | 2,500    |
| „ Employees welfare expenses | 4,200  | „ Interest on loan to Ashok | 5,000    |
| „ Entertainment of customers | 3,400  | „ Bad debts recovered       | 8,000    |
| „ Social welfare expenses    | 3,000  | „ Enhanced compensation     | 25,000   |
| „ Excise duty                | 20,000 |                             |          |
| „ Income tax                 | 14,000 |                             |          |
| „ Establishment              | 50,000 |                             |          |
| „ Depreciation               | 38,000 |                             |          |

|                         |                 |                 |
|-------------------------|-----------------|-----------------|
| „ Interest paid to Bank | 13,000          |                 |
| „ Car expenses          | 72,000          |                 |
| „ Net Profit            | <u>80,000</u>   | _____           |
|                         | <u>3,09,600</u> | <u>3,09,600</u> |

Additional information:

- Rs. 50,000 was given as loan to Ashok.
- During the year Rs. 5,000 interest was received.
- Bad debts recovered were earlier disallowed.
- Enhanced compensation is related to acquisition of Land.
- Bad debts include Rs. 4,000 to his brother.
- Excise duty was paid on 24.11.2013.
- Establishment includes Rs. 10,000 paid to personal servant of Sri. Vinod.
- Car is used 1/3<sup>rd</sup> for business and 2/3<sup>rd</sup> for Sri. Vinod.
- Depreciation admissible as per Income Tax Act Rs. 41,500.

**[2x12=24 marks]**

COM3C13

Reg. No.....

*Model Question Paper*

Name.....

## Third Semester M. Com. Degree Examinations, November 2014

### COM3C14- WEALTH TAX AND INDIRECT TAXES

Time: 3 Hours

Max. 60 Marks

### Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) Define valuation date.

b) What is Deemed Wealth?

c) From the following information find out the value of jewelry as on 31-3-2014:

Value of jewelry determined by Registered Valuer and accepted by the department as on 31-3-2013.

|                            |              |
|----------------------------|--------------|
| Gold 2,000gm @ Rs.1,700/gm | Rs.34,00,000 |
|----------------------------|--------------|

|                                           |                 |
|-------------------------------------------|-----------------|
| Value of Gems and Pearls set in ornaments | <u>2,00,000</u> |
|-------------------------------------------|-----------------|

|  |                  |
|--|------------------|
|  | <u>36,00,000</u> |
|--|------------------|

On 31-3-2014 the rate of gold is Rs. 1,900/gm. The assessee purchased jewelry during the previous year for Rs.1,50,000.

2. a) Who is an adjudicating authority under the Customs Act?

b) What do you mean by specified goods? Explain its provision in the Customs Act. c)

From the following particulars calculate the customs duty payable:

|                                     |              |
|-------------------------------------|--------------|
| Assessable value of important goods | Rs. 5,00,000 |
|-------------------------------------|--------------|

Basic customs duty payable @10%

The important goods are also produced in India. On such goods excise duty is leviable @12%.

SAD @4% and Education cess @3% is leviable.

3. a) Name the taxable event for the charge of Excise Duty.

b) Distinguish between excise duty and customs duty.

c) The selling price of a product inclusive of excise duty @12% is Rs.2,800 /article. If 100 articles are produced and sold compute the

i) Assessable value and

ii) Total excise duty payable

4. a) Give the concept of "service" under the Service Tax

b) What do you understand by point of taxation?

c) Sharman (liable to pay Service Tax) gives the following particulars relating to the service provided to various clients by them for the half-year ended 30-9-2014:

i) Total bills raised for Rs.5,00,000 out of which payment of the bill for Rs.1,00,000 were

not received till 30-9-2014.

ii) Amount of Rs.50,000 was received as an advance from STEPCO Ltd. On 1-9-2014 to whom services were to be provided in January 2014.

You are required to compute taxable value of services and the amount of service tax payable. The bills are exclusive of service tax.

5. a) List the three common methods for computation of VAT.  
 b) Describe the merits of VAT.  
 c) Input worth Rs.1,00,000 is purchased and sales are worth Rs.2,00,000 in a month, input tax rate and output tax rate are 4% and 12.5% respectively.

Calculate VAT and input tax credit/set-off.

6. a) Define Notified goods.  
 b) Who are eligible to avail for CENVAT? State the conditions for availing credit under CENVAT?  
 c) Briefly explain the mechanism of operation of VAT with the help of an illustration.

[4x9= 36 marks]

### Section B

Answer the *two* questions in this Section.

Each question carries 12 marks..

- 7 a) From the following particulars **compute the net wealth** of the resident Indian citizen.

|                                                                             | (Rs. In lakh)      |
|-----------------------------------------------------------------------------|--------------------|
| (1) acquired property                                                       | Self<br>4.00       |
| (2) house (whole year) residential property                                 | Let out<br>5.00    |
| (3) house (eight months) residential property self-occupied 4 months        | Let out<br>5.00    |
| (4) hand                                                                    | Cash in<br>1.70    |
| (5) for personal use                                                        | Jewellery<br>40.00 |
| (6) Delhi used as business office                                           | Flat in<br>10.00   |
| (7) companies                                                               | Shares in<br>4.00  |
| (8) for personal use                                                        | Motor car<br>1.80  |
| (9) deposit in the name of minor son                                        | Fixed<br>2.00      |
| (10) Urban land in Chennai acquired in 1-6-2013 held for industrial purpose | 10.00              |
| (11) Flat in London                                                         | 10.00              |



(12) Loan for purchase of jewellery 10.00

**OR**

**b)** Amit is a Chartered Accountant. His receipts from various professional services for the

Quarter ending 30.9.2014 are as under:

|                                                        | <b>Rs.</b>                  |
|--------------------------------------------------------|-----------------------------|
| (1) consultancy fees                                   | Taxation<br>4,26,250        |
| (2) for Accountant services                            | Remuneration<br>1,12,960    |
| (3) Fees                                               | Statutory Audit<br>2,65,700 |
| (4) Fees                                               | Certification<br>1,45,600   |
| (5) as Internal Auditor in public Ltd. Company         | Remuneration<br>1,58,300    |
| (6) appearing in appeals                               | Fees for<br>1,47,400        |
| (7) teaches at a coaching centre as a visiting faculty | Amit also<br>1,43,200       |

Amit also got re-imbursed out of pocket expenses on actual basis from his clients Rs.85,900.

He has also incurred Rs.3,15,000 as establishment expenses of his office during the period.

**Calculate the value of Taxable Service and Service Tax.** Amit charges service tax separately in the bills raised and hence the above receipts are not inclusive of service tax.

**8. a)** Briefly explain the mechanism of operation of VAT with the help of an illustration.

**OR**

**b)** Explain how the valuation of excisable goods are done.

**[2x12=24marks]**

Reg. No.....

*Model Question Paper*

Name.....

## **Third Semester M. Com. Degree Examinations, November 2014**

### **COM3C15- HUMAN RESOURCE MANAGEMENT**

**Time: 3 Hours**

**Max. 60 Marks**

#### **Section A**

Answer any **four** questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) Define HRM.  
b) Explain the operative functions of HRM.  
c) What are the duties and responsibilities of HR manager in modern organization?
2. a) What do you mean by HRD?  
b) What are the merits of Training to employees?  
c) Is training a necessity? Explain.
3. a) What is code of discipline?  
b) Briefly explain the Hot Stove rule.  
c) What are the essentials of a good grievance procedure?
4. a) What is meant by HR record?  
  
b) What are the objective of HR record?  
  
c) Explain the meaning, scope and importance of HR audit.
5. a) Define recruitment.  
  
b) Distinguish between recruitment and selection.  
  
c) Briefly explain the employee selection procedure.

- 6. a) What do you mean by HR planning?
- b) What are the objective of HR Planning?
- c) Briefly explain HR Planning process?

[4x9= 36 marks]

**Section B**

Answer the following questions. Each question carries 12 marks.

- 7. a) What is performance appraisal? Explain any four methods of performance appraisal. What are the limitations of performance appraisal?

**Or**

- b) Explain the various methods and techniques of training.
- 8. a) Explain the various steps involved in training process.

**Or**

- b) What is grievance? Explain the grievance redressal mechanism of an organization with examples.

[2x12=24marks]

**COM3C15**

Reg. No.....

*Model Question Paper*

Name.....

**Fourth Semester M. Com. Degree Examinations, March 2016**

**COM4E01 - SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT**

**Time: 3 Hours**

**Max. 60 Marks**

**Section B**

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

2. a) What is stock index?  
 b) Compare and contrast between SENSEX and NIFTY.  
 c) For the basic index of 100, the following volume and price details are given. Compute current stock index using (i) Price Weighted Index Method, (ii) Equal Weighted Index Method, and (iii) Market Valued Index method. Assume nil dividends and no change in constituent stock options.

| Stock | Outstanding<br>Shares | Basic Price<br>(₹) | Current Price<br>(₹) |
|-------|-----------------------|--------------------|----------------------|
| A1    | 2,00,000              | 70                 | 150                  |
| A2    | 1,00,000              | 110                | 200                  |
| A3    | 3,00,000              | 150                | 450                  |

3. a) What is Net Asset Value? How is it computed?  
 b) Explain the different types of mutual fund schemes based on asset mix.  
 c) Discuss SEBI regulations for secondary market in India.
4. a) What is book building?  
 b) Discuss the basic assumptions of fundamental analysis.  
 c) What are the quantitative models of equity valuation? Discuss their limitations.
5. a) Define convexity.  
 b) What are the various risks that an investor should foresee while investing in bonds?  
 c) Discuss the various ways in which the return from bonds are measured and expressed?
6. a) Define Relative Strength Index.  
 b) Explain Dow Theory. How does it contrast with Random Walk Theory?  
 c) Explain how technical analysis is useful to investors? How is different chart patterns interpreted in the context of security analysis?

[4x9= 36 marks]

### Section A

Answer the two questions in this Section.

Each question carries 12 marks.

7. a) Decompose the security market in India into its constituents. Explain the role and importance of each of them in the functioning of the securities market.

OR

- b) Define investment. Examine the different investment avenues available in India, highlighting the risks and advantages of each.

8. a) Explain the features of efficient market hypothesis and state its assumptions. What are the tools available for testing the hypothesis?

OR

- b) What are portfolio management plans? Explain. What criterion is used to manage investment portfolios under different market conditions?

**[2x12=24 marks]**

**COM4E01**

Reg. No.....

Model Question Paper

Name.....

**Fourth Semester M. Com. Degree Examinations, March 2016**  
**COM4E04 - CORPORATE TAX PLANNING AND MANAGEMENT**

Time: 3 Hours

Max. 60 Marks

**Section A**

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. (a) What do you mean by MAT?  
 (b) Explain the provisions of the ITA 1961, regarding Corporate Dividend Tax.  
 (c) A (a women aged 70), B (aged 45) and C (aged 35) are members of an Association of Persons sharing in the ratio of 1:2:3. During the financial year 2010-11, the taxable income of the AOP was Rs. 9,00,000 while the personal incomes of A, B and C were Rs. 90,000, Rs. 1,00,000 and Rs. 1,50,000 respectively. Compute the tax liability of the AOP and the members A, B and C for the A.Y 2011-12.
2. (a) What is urban consumer's Co-operative Society?  
 (b) Explain the deductions available to a co-operative society U/S 80P.  
 (c) The following are the incomes of Ahsas Co-operative Society for the previous year ended on 31<sup>st</sup> March 2012:

| Particulars                                                                            | Rs.    |
|----------------------------------------------------------------------------------------|--------|
| i) Interest on Securities (gross)                                                      | 6,000  |
| ii) Income from credit facilities to members                                           | 15,000 |
| iii) Income from purchase and sale of agricultural implements and seeds to its members | 25,000 |
| iv) Income from marketing of agricultural produce of its members                       | 25,000 |
| v) Profit from other businesses                                                        | 60,000 |
| vi) Interest and dividends (gross) from other co-operative societies                   | 10,000 |
| vii) Income from cottage industry                                                      | 20,000 |
| viii) Rent received from house property                                                | 12,000 |

Compute total income and gross tax liability of the society for the AY 2012-13.

- 3 (a) What do you mean by HUF for tax purposes?  
 (b) How does the partition of the HUF affect the assessment of income?  
 (c) From the following particulars furnished by the Karta of a Hindu undivided family Compute the total income of the family for the assessment year 2011-12.

| Particulars                                                          | Rs.    |
|----------------------------------------------------------------------|--------|
| 1. Profit from business                                              | 50,000 |
| 2. Salary received by a member of the family employed in a Govt Dept | 40,000 |
| 3. Director's fees received by Karta (Individual capacity)           | 5,000  |

|                                                                         |       |
|-------------------------------------------------------------------------|-------|
| 4. Municipal value of the property let out (rent receivable Rs. 10,000) | 8,000 |
| 5. Dividends from a Co-operative society                                | 4,000 |
| 6. Dividends from an Indian company                                     | 5,000 |
| 7. Donations to Rajiv Gandhi Foundation                                 | 5,000 |

During the year the family sold some shares for Rs. 60,000 which were purchased on 1.3.1987 for Rs. 10,000.

The cost inflation indices for the financial years 1986-87 and 2010-11 are 140 and 711 respectively.

4. (a) What is TDS?  
(b) Explain the provisions relating to advance payment of tax?  
(c) Which are the modes of recovery of tax?
5. (a) Who is a NRI?  
(b) What advice would you give to a person having income in India and abroad and who stays in India and outside India for different time periods regarding residence?  
(c) A company requires you to suggest a scheme for remuneration to employees from tax point of view. Outline the various considerations that you will include in your report.
6. (a) Is there any benefit in holding a financial assets for more than 12 months before it is sold?  
(b) What the measures would you suggest with regard to management decision of 'shut down or continue' a loss making business.  
(c) "The loan capital contributes to tax saving resulting in a higher rate of return on owner's equity". Do you agree? Illustrate your answer with suitable examples.

[4x9= 36 marks]

### Section A

Answer the two questions in this Section.

Each question carries 12 marks.

7. What are the various authorities envisaged in the Indian Income Tax Law and what are their functions.

**OR**

X and Y are equal partners in a firm. From the following Profit and Loss Account compute the total income of the firm for the AY 2012-13.

| Particulars                       | Rs.             | Particulars                | Rs.             |
|-----------------------------------|-----------------|----------------------------|-----------------|
| Interest on capital@12%           |                 | Business Profits           | 4,30,000        |
| X                                 | 9,000           | Income from house property | 10,100          |
| Y                                 | 15,000          | Capital gains:             |                 |
| Remuneration to working Partners: |                 | Long term                  | 20,000          |
| X                                 | 1,60,000        | Short term                 | 10,000          |
| Y                                 | 1,30,000        |                            |                 |
| Approved charitable donations     | 10,000          |                            |                 |
| Profit:                           |                 |                            |                 |
| X                                 | 73,050          |                            |                 |
| Y                                 | 73,050          |                            |                 |
|                                   | <u>4,70,100</u> |                            | <u>4,70,100</u> |

The remuneration and interest on capital are as per partnership deed. Other informations are:

1. X paid interest to the firm on drawings for household expenses Rs. 2,000, which is included in business profits.
  2. Y paid interest Rs. 10,000 on money borrowed to contribute capital in the firm.
  3. X purchased a car for Rs. 1,80,000 in June, 2011. The expenses on running and maintaining the car for the year are Rs. 20,000. He says that car has been used for the firm and other personal purposes. The use of the car for personal purposes may be taken as 50%. The proper amount has been charged to P&L A/c.
8. Explain the term 'tax planning', 'tax avoidance' and 'tax evasion' and distinguish between tax management and tax planning.

**OR**

Compute the taxable income of Prabhakar Ltd. for the PY 2012-13 from the following Profit and Loss Account and additional information:

| Particulars                         | Rs.      | Particulars                 | Rs.      |
|-------------------------------------|----------|-----------------------------|----------|
| To Salaries and bonus               | 1,00,000 | By Gross profit             | 5,00,000 |
| To Office rent                      | 10,000   | By Interest                 | 10,000   |
| To War risk insurance               | 10,000   | By Short term capital gains | 15,000   |
| To Postage & Stationery             | 10,000   |                             |          |
| To General charges                  | 20,000   |                             |          |
| To Reserve for Dep.                 | 25,000   |                             |          |
| To Income tax 2010-11               | 50,000   |                             |          |
| To Provision for income tax 2011-12 | 2,00,000 |                             |          |
| To Net profit                       | 1,00,000 |                             |          |
|                                     | 5,25,000 |                             | 5,25,000 |

Additional information:

- (a) The general charges include Rs. 5,000 for advertising; Rs. 1,000 for charitable donation; Rs. 3,000 paid to a Motor car company for exchanging the old car for a new one; Rs. 1,000 for charity and Rs. 5,000 for miscellaneous repairs.
- (b) The amount of depreciation admissible under the Income Tax Act is Rs. 15,000 only.
- (c) The amount of interest is from Govt. securities.

**[2x12=24 marks]**

**COM4E04**

Reg. No.....

*Model Question Paper*

Name.....

**Fourth Semester M. Com. Degree Examinations, March 2016**

**COM4E01 - CONSUMER BEHAVIOUR**



Time: 3 Hours

Max. 60 Marks

### Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. (a) What do you understand by consumer behaviour?  
(b) What is customer relationship management?  
(c) Distinguish between consumer and buyer.
  
2. (a) What do you mean by buying motives?  
(b) What are the characteristics of consumer behaviour?  
(c) Explain the importance of studying consumer behaviour in marketing.
  
3. (a) What are the different types of markets in India?  
(b) What are the defects of Indian market?  
(c) "Marketing environment offers both opportunities and threats". Discuss
  
4. (a) What do mean by business markets?  
(b) How do business buyers make their buying decisions?  
(c) Describe the Howard-Sheth model of consumer behaviour.
  
5. (a) Define consumer satisfaction.  
(b) State the personal factors influencing consumer.  
(c) Give a brief account of emotional and rational motives.
  
6. (a) What are the psychological factors that influence in consumer decision maker?  
(b) Point out the different steps in the buyer decision process.  
(c) Discuss the similarities and differences between business market and consumer market.

[4x9= 36 marks]

### Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. (a) What are buying motives? What are the different types of buying motives?

**OR**

(b) What are the different types of factors which influence the marketing environment?

8. (a) Discuss the cultural, social, personal and psychological factors that affect consumer behaviour.

**OR**

(b) Elucidate the different stages through which the business buyers make their buying decisions.

**[2x12=24 marks]**

**COM4E01**

Reg. No.....

*Model Question Paper*

Name.....

**Fourth Semester M. Com. Degree Examinations, March 2016**

**COM4E02 - ADVERTISING AND SALES MANAGEMENT**

**Time: 3 Hours**

**Max. 60 Marks**

**Section A**

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. (a) What is direct marketing?

(b) Differentiate telemarketing from teleshopping.

(c) What are the different forms of direct marketing programmes?

2. (a) Define promotion.

(b) What is meant by the concept of the promotional blend?

(c) What are the basic types of promotion strategy.

3. (a) What is advertising?

(b) How is advertising effectiveness tested?

(c) "The success of the advertisement campaign depends on proper selection of the media for advertisement." Discuss.

4. (a) Define salesmanship.  
(b) What are the essentials of effective selling?  
(c) "Salesmen are born and not made." Discuss
5. (a) What is sales promotion?  
(b) What is the significance of sales promotion in marketing industrial products?  
(c) Distinguish between marketing and selling.
6. (a) What do you mean by sales organisation?  
(b) What are the important functions of sales management?  
(c) What are the qualities of an effective sales manager?

[4x9= 36 marks]

### **Section B**

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. (a) Do you think that advertising is an investment? Discuss.

**OR**

(b) What are the various kinds of tests commonly used in the selection of salesmen? What are the advantages of using tests? Are there any dangers?

8. (a) Personal selling is a two-way communication best suited to a company marketing consumer products with a poor brand loyalty. Discuss.

**OR**

(b) What is advertising? Discuss its objectives and point out the problems of advertising in India.

[2x12=24 marks]

**COM4E01**



KANNUR  UNIVERSITY

(Abstract)

M.Sc Computer Science Programme – Scheme, Syllabus and Model Question Papers – Core / Elective Courses under – Credit Based Semester System – Affiliated Colleges - Implemented with effect from 2014 admission - Orders issued.

ACADEMIC BRANCH

U.O.No.Acad/C4/12581/2014

Dated: Civil Station P.O, 20-10-2014

- Read:-
1. U.O.No.Acad.C1/11460/2013 dated 12-03-2014.
  - 2.Minutes of the meeting of the Board of Studies in Computer Science PG held on 16/07/2014.
  - 3.Minutes of the meeting of the Faculty of Technology held on 01/04/2014.
  - 4.Letter dated 29/09/2014 from Dr. Raju Chairman, Board of Studies in Computer Science (PG)

ORDER

1.Revised Regulations for Credit Based Semester System for PG Programmes in affiliated Colleges have been implemented in this University with effect from 2014 admission vide paper read (1) above.

2.The Board of Studies in Computer Science (PG) vide paper read (2) above, has finalized the Scheme, Syllabus and Model Question papers for M.Sc Computer Science under Credit Based Semester System with effect from 2014 admission.

3. As per paper read (3) above, the meeting of Faculty of Technology, approved the Scheme, Syllabus and Model Question papers for M.Sc Computer Science with effect from 2014 admission.

4.The Chairman, Board of Studies in Computer Science (PG) vide paper (4) above, has forwarded the Scheme, Syllabus and Model Question papers for M.Sc Computer Science for implementation with effect from 2014 admission.

5.The Vice Chancellor, after considering the matter in detail, and in exercise of the power of the Academic Council, conferred under Section 11 (1) of Kannur University Act, 1996 and all other enabling provisions read together with, has accorded sanction to implement the Scheme, Syllabus and Model Question Papers (Core/Elective Courses) for M.Sc Computer Science Programme in affiliated Colleges Under Credit Based Semester System with effect from 2014 admission subject to report Academic Council.

6. Orders are, therefore issued accordingly.

7. The implemented Scheme, Syllabus and Model Question Papers are appended.

Sd/-

DEPUTY REGISTRAR (Acad)  
For REGISTRAR

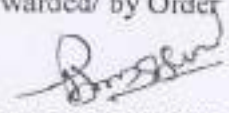
To

The Colleges offering M.Sc Computer Science Programme.

Copy to:

- 1.The Examination Branch Through (PA to CE)
- 2.The Chairman, Board of Studies in Computer Science (PG)
- 3.PS to VC/PA to R/PA to CE
- 4.DR/AR-1 Academic

Forwarded/ by Order

  
SECTION OFFICER



# KANNUR UNIVERSITY

## M Sc COMPUTER SCIENCE

(Credit Based Semester System)

### Regulations, Curricula, Syllabus and Scheme of Evaluation

(With Effect from 2014 admission)

#### REGULATIONS

**1. Duration** of the M. Sc. (Computer Science) programme shall be 2 years, divided into 4 semesters. Each semester shall have 90 working days. The maximum period of completion is eight semesters ( 4 years).

**2. Eligibility for admission:** As announced by the University from time to time.

#### **3. Programme Structure**

**3.1 Attendance:** The minimum attendance required for each course shall be 75% of the total number of classes conducted for that semester. Those who secure the minimum attendance in a semester alone will be allowed to register for the End Semester Examination. Condonation of shortage of attendance may be granted as per Kannur University PG regulation.

**3.2 Credits:** The total minimum credits, required to complete M. Sc. Computer Science programme is 80 in which minimum credits required for core (including practical and project) courses is 60 and for Elective courses is 12.

#### **3.3 Theory and Practical courses**

The evaluation scheme for each Theory and Practical courses except MCS3C16 Research Methodology shall contain two parts; (a) Continuous Assessment (CA) and (b) End Semester Evaluation (ESE). 20% marks shall be given to CA and the remaining 80 % to ESE. For MCS3C16 Research methodology the evaluation is 100% internal and shall follow the distribution applicable to theory CA.

#### **CONTINUOUS ASSESSMENT (CA)**

**Theory :** The components of theory evaluation are as follows:

|     | COMPONENTS                  | % OF MARKS |
|-----|-----------------------------|------------|
| i   | Test papers                 | 40%        |
| ii  | Assignment                  | 20%        |
| iii | Case Study / Seminar / Viva | 20%        |
| iv  | Attendance                  | 20%        |

- i. *Test Papers*: There shall be a minimum of two test papers to be conducted for each course. If more than two test papers are conducted, then two best scores shall be taken for the award of IA marks. The dates of test papers shall be announced well in advance and the marks should be displayed in the notice board.
- ii. *Assignments*: One or more assignments (including practical assignments) shall be given for each course. The mode of assessment of the assignments shall be decided by the faculty concerned with due approval from the department council and shall be declared at the beginning of the semester. (It is suggested that to the extent possible, give individual assignments and also conduct short viva based on the assignment submitted).
- iii. *Case study / Seminar / viva*: The faculty with due approval from the department council shall choose one or more from this category, depending on the nature of subject and the mode of assessment is to be declared at the commencement of the semester. For seminar, topics outside but related to the syllabus shall be chosen.
- iv. *Attendance* :

| Attendance | % of Marks for attendance |
|------------|---------------------------|
| >=90       | 100                       |
| 85 to 89   | 80                        |
| 80 to 84   | 60                        |
| 76 to 79   | 40                        |
| 75         | 20                        |

**Practical** :The Components of CA for practical courses except Case study I and II are as follows:

|     | COMPONENTS                                                                      | % OF MARKS |
|-----|---------------------------------------------------------------------------------|------------|
| i   | Lab Test (Minimum one)                                                          | 20%        |
| ii  | Completion of the list of Lab assignments prescribed by the faculty             | 20%        |
| iii | Periodical assessment of Lab assignments through execution of programs and viva | 40%        |
| iv  | Attendance (Mark distribution is same as that of theory)                        | 20%        |

For Case study I and II :

|     | COMPONENTS                                                                                                                 | % OF MARKS |
|-----|----------------------------------------------------------------------------------------------------------------------------|------------|
| i   | Periodical viva / short quizzes / short programming assignments to evaluate the basic knowledge/understanding of the tool. | 30%        |
| ii  | Coding – Logic, Selection of appropriate constructs / features of the Tool, Style etc.                                     | 30%        |
| iii | Execution of the case study - output                                                                                       | 20%        |
| iv  | Viva based on case study                                                                                                   | 20%        |

**Note** :All the records in respect of Continuous Assessment (CA) must be kept in the department and must be made available for verification by university. The results of the CA shall be displayed on the notice board within 5 working days from the last day of a semester. It should be get signed by the candidates. The marks awarded for various components of the CA shall not be rounded

off, if it has a decimal part. The total marks of the CA shall be rounded off to the nearest whole number.

#### **END SEMESTER EVALUATION (ESE):**

*There shall be double valuation system of answer books. The average of two valuations shall be taken in to account. If there is a variation of more than 10% of the maximum marks, the answer books shall be valued by a third examiner. The final marks to be awarded shall be the average of the nearest two out of three awarded by the examiners. After that there shall be no provision for revaluation*

Pattern of questions: Questions shall be set to assess knowledge acquired, standard application of knowledge, application of knowledge in new situations, critical evaluation of knowledge and the ability to synthesize knowledge. Question paper for end semester theory examination shall consist of:

- i. Short answer type : 12 questions of which 10 to be answered.  $10 \times 3 = 30$  marks,
- ii. Essay type: 5 questions (one either –or question from each module)  $\times 10$  marks = 50 marks

*End Semester Evaluation in Practical courses* shall be conducted and evaluated by two examiners- one internal and one external. Details of scheme of evaluation of ESE practical courses are given along with respective syllabus.

**3.4 Project:** A project work has to be undertaken by all students. The project can be software development following all or some of the software development lifecycle or an R&D project. The hours allotted for project work may be clustered into a single slot so that students can do their work at a centre or location for a continuous period of time. The Major project work should be carried out in the Department /Institution or in a level Industry / R & D organization of national repute. Project work shall be carried out under the supervision of a Teacher. If the project is carried out in an Industry / R & D organization outside the campus, then a co-guide shall be selected from the concerned organization. If the project work is of interdisciplinary in nature, a co-guide shall be taken from the other department concerned. Every student should do the Project individually and no grouping is allowed. All the candidates are required to get the approval of their synopsis and the guide before commencement of the project from the Department. A co-guide should be a postgraduate in CS or allied subject or a person of eminence in the area in which student has chosen the project. At the end of the semester the candidate shall submit the Project report (two bound copies and one soft copy) duly approved by the guide and co-guide for End Semester Evaluation. The project report shall be prepared according to the guidelines approved by the University.

#### ***Evaluation of Project:***

- i. A Departmental committee duly constituted by the Head of the Department will review the project periodically.
- ii. **Continuous Assessment of project work:** There shall be three internal presentations before the committee (Minimum two members, including the guide). The assessment is based on presentation, interim report and viva voce. The total mark for CA shall be divided among the three presentations in the ratio 20%:30%:50%. Each internal presentation shall be evaluated based on the following components:



| Component                                                             | % of marks |
|-----------------------------------------------------------------------|------------|
| Understanding of the problem / concepts                               | 25         |
| Adhering to methodology.                                              | 20         |
| Quality of presentation and demonstration (Demonstration is optional) | 15         |
| Quantum of work / effort                                              | 30         |
| Organization and content of mid-term report                           | 10         |

- iii. End Semester Assessment of Project:** A board of two examiners appointed by the University shall conduct ESE evaluation. The evaluation shall be based on the report, presentation of the work, demonstration of the work (optional) and a detailed viva voce based on the work carried out. A candidate will not be permitted to attend the Project evaluation without duly certified project reports. Also a project will be evaluated only if the candidate attend the ESE presentation and Viva voce on the scheduled date and time. A board shall evaluate a maximum of 10 candidates in a day. The ESE evaluation shall consist of the following components:

| Component                                                                                                                                                                                                                                                                 | % of marks |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Understanding of the problem/requirements/ concepts related to the project                                                                                                                                                                                                | 15         |
| Adhering to methodology (Software engineering phases or research methodology) and the candidates understanding of the components of methodology                                                                                                                           | 15         |
| Quality of Modeling of the problem and solution/ database design / form design / reports / testing (For research projects - relevance /novelty of the work(s)/ use of data/ proposal of new models /analysis of algorithms/ comparison and analysis of results /findings) | 20         |
| Quality of presentation / demonstration                                                                                                                                                                                                                                   | 15         |
| Quantum of work / effort - assessed through the content of report, presentation and viva.                                                                                                                                                                                 | 25         |
| Organization and content of report                                                                                                                                                                                                                                        | 10         |

- iv.** A student shall be declared to pass in the Project report course if she/he secures minimum 40 % marks of the aggregate and 40% separately for external.
- v.** If a candidate fail in the evaluation of Project, he/she has to repeat the project course along with the next batch and undergo both CA and ESE. *Unlike theory/practical courses, the CA mark will not retained.*
- vi.** There shall be no improvement chance for the marks obtained in the Project course.

**3.5 Seminar:** Each student shall select a relevant topic, prepare a seminar report and give a presentation (30 to 45 minutes), under the guidance of a faculty member. The evaluation of seminar

is 100% internal and components and mode of evaluation shall be formulated by the department council (May include components like content, Presentation, interaction and structure of report).

**3.6 VIVA VOCE:** A general Viva Voce covering all courses in the Programme shall be conducted in the fourth semester. The Viva voce shall be conducted by two external examiners. The Viva voce *shall not be clubbed* with the project evaluation. The details of the mode of conduct and evaluation of Viva Voce shall be decided by the BOE.

#### 4. GRADING SYSTEM

##### Seven Point Indirect Relative grading system:

Evaluation( both internal and external) is carried out using Mark system .The grading on the basis of a total internal and external marks will be indicated for each course and for each semester and for the entire programme.

The guidelines of grading is as follows-

| % of Marks (CA+ESE) | Grade | Interpretation | Range of grade points | Class                        |
|---------------------|-------|----------------|-----------------------|------------------------------|
| 90 and above        | O     | Outstanding    | 9-10                  | First class with Distinction |
| 80 to below 90      | A     | Excellent      | 8-8.9                 |                              |
| 70 to below 80      | B     | Very good      | 7-7.9                 | First class                  |
| 60 to below 70      | C     | Good           | 6-6.9                 |                              |
| 50 To below 60      | D     | Satisfactory   | 5-5.9                 | Second class                 |
| 40 to below 50      | E     | Pass/Adequate  | 4-4.9                 | Pass                         |
| Below 40            | F     | Failure        | 0-3.9                 | Fail                         |

$$\text{S.G.P.A} = \frac{\text{SUM OF CREDIT POINTS OF ALL COURSES IN THE SEMESTER}}{\text{TOTAL CREDITS IN THAT SEMESTER}}$$

$$\text{CREDIT POINT} = \text{GRADE POINT (G)} \times \text{CREDIT (C)}$$

C.G.P.A =  $\frac{\text{Sum of credit points of all completed semesters}}{\text{Total credits acquired}}$

OGPA =  $\frac{\text{Sum of credit points obtained in four semesters}}{\text{Total credits (80)}}$

**PASS REQUIREMENT:**

**COURSE:**

A CANDIDATE SECURING E GRADE WITH 40% OF AGGREGATE MARKS AND 40% SEPARATELY FOR ESE FOR EACH COURSE SHALL BE DECLARED TO HAVE PASSED IN THAT COURSE.

**SEMESTER**

Those who secure not less than 40 % marks (both ESE and CA put together) for all the courses of a semester shall be declared to have successfully completed the semester.

The marks obtained by the candidates for CA in the first appearance shall be retained (irrespective of pass or fail)

The candidates who fail in theory unit shall reappear for theory unit only, and the marks secured by them in practical unit, if passed in practical, will be retained.

A candidate who fails to secure a minimum for a pass in a course will be permitted to write the same examination along with the next batch.

For the successful completion of a semester, a candidate should pass all courses and secure a minimum SGPA of 4. However a student is permitted to move to the next semester irrespective of his/her SGPA. A student will be permitted to secure a minimum SGPA of 4.00 required for the successful completion of a Semester or to improve his results at ESE of any semester, by reappearing for the ESE of any course of the semester concerned, along with the examinations conducted for the subsequent admission

**IMPROVEMENT:**

A candidate who secures minimum marks (40 %) for a pass in a course will be permitted to write the same examination along with the next batch if he/she

desires to improve his/her performance in ESE. If the candidate fails to appear for the improvement examination after registration, or if there is no change/up gradation in the marks after availing the improvement chance, the marks obtained in the first appearance shall be retained. There shall be no improvement chance for the marks obtained in internal assessment. Improvement of a particular semester can be done only once. The student shall avail the improvement chance in the succeeding year along with the subsequent batch.

There will be no supplementary examinations. For re-appearance/ improvement student can appear along with the next batch.

**KANNUR UNIVERSITY**  
**M Sc COMPUTER SCIENCE**  
**Course Structure and Scheme of Evaluation (From 2014 Admission)**  
**(CBSS- For affiliated Colleges)**

***CREDIT DISTRIBUTION***

| <b>Semester</b> | <b>Core</b> | <b>Elective</b> | <b>Practical</b> | <b>Project</b> | <b>Total</b> |
|-----------------|-------------|-----------------|------------------|----------------|--------------|
| <b>1</b>        | <b>17</b>   | <b>0</b>        | <b>3</b>         | <b>0</b>       | <b>20</b>    |
| <b>2</b>        | <b>16</b>   | <b>0</b>        | <b>5</b>         | <b>0</b>       | <b>21</b>    |
| <b>3</b>        | <b>13</b>   | <b>3</b>        | <b>5</b>         | <b>0</b>       | <b>21</b>    |
| <b>4</b>        | <b>2</b>    | <b>9</b>        | <b>0</b>         | <b>7</b>       | <b>18</b>    |
| <b>Total</b>    | <b>48</b>   | <b>12</b>       | <b>13</b>        | <b>7</b>       | <b>80</b>    |

**COURSE STRUCTURE**

**SEMESTER 1**

| <b>Course Code</b> | <b>Course title</b>                    | <b>Instructional Hrs/week</b> |          |          | <b>MARKS</b> |            |              | <b>Credit</b> |
|--------------------|----------------------------------------|-------------------------------|----------|----------|--------------|------------|--------------|---------------|
|                    |                                        | <b>L</b>                      | <b>P</b> | <b>T</b> | <b>CA</b>    | <b>ESA</b> | <b>TOTAL</b> |               |
| MCS1C01            | Discrete Mathematics                   | 3                             | 0        | 1        | 20           | 80         | 100          | 3             |
| MCS1C02            | Computer Organization and Architecture | 3                             | 0        | 1        | 20           | 80         | 100          | 3             |
| MCS1C03            | Digital Systems and Microprocessors    | 4                             | 0        | 0        | 20           | 80         | 100          | 4             |
| MCS1C04            | Operating Systems                      | 3                             | 0        | 1        | 20           | 80         | 100          | 3             |
| MCS1C05            | Introduction to Programming            | 4                             | 0        | 0        | 20           | 80         | 100          | 4             |
| MCS1P01            | Lab – I ( IP/OS)                       | 0                             | 8        | 2        | 20           | 80         | 100          | 3             |
| <b>Total</b>       |                                        | <b>17</b>                     | <b>8</b> | <b>5</b> | <b>120</b>   | <b>480</b> | <b>600</b>   | <b>20</b>     |

**SEMESTER 2**

| Course Code | Course title                         | Instructional Hrs/week |    |   | MARKS      |            |            | Credit    |
|-------------|--------------------------------------|------------------------|----|---|------------|------------|------------|-----------|
|             |                                      | L                      | P  | T | CA         | ESA        | TOTAL      |           |
| MCS2C06     | Java Programming                     | 3                      | 0  | 0 | 20         | 80         | 100        | 3         |
| MCS2C07     | Data Structures & Algorithms         | 3                      | 0  | 0 | 20         | 80         | 100        | 3         |
| MCS2C08     | Database Management Systems          | 3                      | 0  | 0 | 20         | 80         | 100        | 3         |
| MCS2C09     | Computer Networks                    | 3                      | 0  | 0 | 20         | 80         | 100        | 3         |
| MCS2C10     | Formal Languages and Finite Automata | 3                      | 0  | 0 | 20         | 80         | 100        | 3         |
| MCS2P02     | Lab – II ( Java/DS/DBMS)             | 0                      | 7  | 1 | 20         | 80         | 100        | 3         |
| MCS2P03     | Case Study I                         | 0                      | 3  | 2 | 10         | 40         | 50         | 2         |
| MCS2C11     | Seminar                              | 0                      | 0  | 2 | 50         | 0          | 50         | 1         |
| Total       |                                      | 15                     | 10 | 5 | <b>180</b> | <b>520</b> | <b>700</b> | <b>21</b> |

**SEMESTER 3**

| Course Code       | Course title                                  | Instructional Hrs/week            |   |   | MARKS      |            |            | Credit    |   |
|-------------------|-----------------------------------------------|-----------------------------------|---|---|------------|------------|------------|-----------|---|
|                   |                                               | L                                 | P | T | CA         | ESA        | TOTAL      |           |   |
| MCS3C12           | Computer Graphics                             | 3                                 | 0 | 0 | 20         | 80         | 100        | 3         |   |
| MCS3C13           | System Programming & Compiler Design          | 3                                 | 0 | 0 | 20         | 80         | 100        | 3         |   |
| MCS3C14           | System Administration and Network Programming | 3                                 | 0 | 0 | 20         | 80         | 100        | 3         |   |
| MCS3C15           | Software Engineering                          | 3                                 | 0 | 0 | 20         | 80         | 100        | 3         |   |
| MCS3C16           | Research methodology                          | 1                                 | 0 | 1 | 50         | 0          | 50         | 1         |   |
| <b>ELECTIVE I</b> | MCS3E01                                       | Digital Signal Processing         | 3 | 0 | 0          | 20         | 80         | 100       | 3 |
|                   | MCS3E02                                       | Probability and Statistics        |   |   |            |            |            |           |   |
|                   | MCS3E03                                       | Fuzzy Systems                     |   |   |            |            |            |           |   |
|                   | MCS3E04                                       | Design and Analysis of Algorithms |   |   |            |            |            |           |   |
|                   | MCS3E05                                       | Information Security              |   |   |            |            |            |           |   |
| MCS3P04           | Lab – III (CG /NP&A/SP&CD)                    | 0                                 | 6 | 2 | 20         | 80         | 100        | 3         |   |
| MCS3P05           | Case study II                                 | 0                                 | 3 | 2 | 10         | 40         | 50         | 2         |   |
| Total             |                                               | 16                                | 9 | 5 | <b>180</b> | <b>520</b> | <b>700</b> | <b>21</b> |   |

## SEMESTER 4

| Course Code | Course title      | Instructional Hrs/week      |    |   | MARKS |     |       | Credit |   |
|-------------|-------------------|-----------------------------|----|---|-------|-----|-------|--------|---|
|             |                   | L                           | P  | T | CA    | ESA | TOTAL |        |   |
| ELECTIVE 2  | MCS4E06           | Digital Image Processing    | 3  | 0 | 0     | 20  | 80    | 100    | 3 |
|             | MCS4E07           | Digital Speech Processing   |    |   |       |     |       |        |   |
|             | MCS4E08           | Operations Research         |    |   |       |     |       |        |   |
|             | MCS4E09           | Linux Kernel                |    |   |       |     |       |        |   |
|             | MCS4E10           | Simulation and Modeling     |    |   |       |     |       |        |   |
| ELECTIVE 3  | MCS4E11           | Mobile Computing            | 3  | 0 | 0     | 20  | 80    | 100    | 3 |
|             | MCS4E12           | Pattern Recognition         |    |   |       |     |       |        |   |
|             | MCS4E13           | Artificial Neural Networks  |    |   |       |     |       |        |   |
|             | MCS4E14           | High Performance Computing  |    |   |       |     |       |        |   |
|             | MCS4E15           | Visual Cryptography         |    |   |       |     |       |        |   |
| ELECTIVE 4  | MCS4E16           | Linux Device Drivers        | 3  | 0 | 0     | 20  | 80    | 100    | 3 |
|             | MCS4E17           | Data Mining                 |    |   |       |     |       |        |   |
|             | MCS4E18           | Natural Language Processing |    |   |       |     |       |        |   |
|             | MCS4E19           | Cyber Forensic              |    |   |       |     |       |        |   |
|             | MCS4E20           | Artificial Intelligence     |    |   |       |     |       |        |   |
| MCS3Pr04    | Project           | 0                           | 16 | 5 | 20    | 80  | 100   | 7      |   |
| MCS4C17     | General Viva Voce | -                           | -  | - | -     | 100 | 100   | 2      |   |
| Total       |                   | 9                           | 16 | 5 | 80    | 420 | 500   | 18     |   |

**SYLLABUS**  
**CORE COURSES**  
**(Theory)**



## MCS1C01 DISCRETE MATHEMATICS

**Contact Hours/ week : 3**

**Credit : 3**

### Unit 1

Propositional logic – Propositions, truth tables, converse, contra positive and inverse, compound statements and their truth tables, translating natural language sentences to logical statements, tautology, contradiction, logical equivalence, De Morgan’s laws, normal forms.

Predicate logic – predicates, universal and existential quantifiers, binding variables, translating natural language sentences to logical statements.

### Unit 2

Sets, representation of sets, set operations, Cartesian product, using set notation with quantifiers, truth sets of quantifiers, computer representation of sets. Functions – one-to-one and onto functions, inverse functions and compositions of functions.

### Unit 3

Relations – properties, functions as relations, relations on a set, combining relations, n-ary relations and their applications, representing relations, closures of relations, Warshall’s algorithm, equivalence relations, equivalence classes and partitions.

### Unit 4

Basics of counting, basic counting principles, the inclusion-exclusion principle, the pigeonhole principle, the generalized pigeonhole principle, permutations and combinations, with and without repetitions. Generating permutations and combinations. Recurrence relations, modeling with recurring relations.

### Unit 5

Graphs – definition, different types of graphs, graph models, basic terminology, representing graphs, isomorphism, connectivity, Euler and Hamilton paths, shortest path problem and Dijkstra’s algorithm.

Trees - basic terminology, properties (no proofs), spanning trees, depth-first and breadth-first searches.

### Reference books:

1. Kenneth H. Rosen, Discrete Mathematics and Applications, TMH 2003
2. J.P. Tremblay and R Manohar Discrete Mathematical Structure with Applications to Computer Science, TMH 2001.
3. John Truss, Discrete Mathematics for Computer Scientists, Pearson Edn 2002
4. Sengadir, Discrete Mathematics, Pearson, 2009

## MCS1C02 COMPUTER ORGANIZATION AND ARCHITECTURE

**Contact Hours/ week : 3**

**Credit : 3**

### Unit 1

**Basic structure** :Basic operational concepts. Number representation and arithmetic operations.Character representations.Performance.

**Instruction set Architecture:** Memory locations and addresses, memory operations, instructions and instruction sequencing, addressing modes. Assembly language, stacks, subroutines, RISC vs CISC.

### Unit 2

**Basic I/O:** Accessing I/O devices (device interface, program controlled I/O), Interrupts (enabling and disabling, handling multiple interrupts, controlling I/O device behavior, Processor control registers, exceptions).

**I/O organization:** Bus structure, bus operation, arbitration, Interface circuits, interconnection standards (USB, PCI, Firewire, SCSI, SATA).

### Unit 3

**Basic Processing Unit :** Fundamental concepts, Instruction execution, Hardware components, Instruction fetch and execution steps, control signals, Hardwired control, CISC style processors (3-bus organization, microprogrammed control).

**Arithmetic** - multiplication of unsigned numbers (array and sequential multipliers), multiplication of signed numbers (Booth algorithm), Fast multiplication (bit pair recoding), Floating point numbers and operations.

### Unit 4

**Memory system :** Basic concepts, Semiconductor RAMS, ROMs, DMA, Memory hierarchy, Cache memory, performance requirements, virtual memory, memory management requirements, secondary storage devices.

### Unit 5

**Pipelining:** basic concepts, pipeline organization, issues, data dependencies, memory delays, branch delays, performance evaluation, superscalar operations.

**Parallel processing:** Hardware multithreading, Vector processing, Shared memory multiprocessors, message passing multi-computers.

### Text book:

1. Hamacher, Vranesic, Zaky, Manjikian, Computer Organization and Embedded Systems, 6<sup>th</sup>edn, Tata McGraw Hill.

### Reference books:

1. William Stallings, Computer Organization & Architecture – Designing for Performance, 9th Edn, Pearson
2. John P. Hayes, Computer Architecture and Organization, Third Edn, Tata McGraw Hill.
3. M. Morris Mano, Computer System Architecture, PHI 2003

## MCS1C03 DIGITAL SYSTEMS & MICROPROCESSORS

**Contact Hours/ week: 4**

**Credit: 4**

### Unit 1.

Gates, Boolean algebra & Laws, Combinational Circuits : SOP, POS, K-Map Simplification (up to 6 variables), Tabular method, Decoders, Multiplexer, De-multiplexer, Encoder, Adders: Half Adder, Full Adder, Cascading Full-Adders, Look-Ahead Carry, Logic Families: RTL, DTL,  $I^2L$ , TTL, ECL, MOS, FETs, MOSFETs, CMOS..

**Unit 2**

Sequential circuits: Flip-flops: SR, JK, D, Master-Slave, Edge-Triggered, T flip-flops Registers: Registers with parallel load, Shift Registers, Bidirectional Shift Registers with parallel load, Tristate Registers, Counters: Design, Simple Counters(Divide by 2,4 and 8, Johnson Counter, Ring Counter), Ripple Counters, Synchronous Counters.

**Unit 3**

Microprocessors: Architecture of 8085, Block Diagram and pin outs, Instruction set, Addressing modes, Subroutines, Interrupts, Peripheral Interfacing.8255A Programmable peripheral interfacing: 8254 programmable interval timer, 8237 DMA Controller, 8279 Keyboard/Display Controller.

**Unit 4**

Advanced Microprocessors: Architecture of 8086, Additional features of 8086: Pin diagrams, Timing Diagrams, Addressing Modes, Memory organization – segment-offset addressing, , Min-Max mode, Stack structure, Interrupts.

**Unit 5**

Special Features of advanced processors 386,486 and Pentium: Memory System, I/O System, Timing, Registers, Memory Management. 386: Moving to protected mode, Virtual mode, Memory paging mechanism. Pentium: Extensions- Introduction.

**Reference Books**

1. John . M. Yarbrough , Digital Logic Applications and Design,Thomson -2002 .
2. M. Moris Mano, Digital Design – PHI 2001
3. R. Gaonkar, Microprocessor Architecture and Programming.TMH-2002.
4. Bary B. Brey, The Intel microprocessors , PHI 2003

## MCS1C04 OPERATING SYSTEMS

**Contact Hours/ week : 3**

**Credit : 3**

**Unit 1**

**Introduction** – Mainframe systems, Desktop systems, Multiprocessor systems, Distributed systems, Clustered systems, Real time systems, Hand held systems, Computing environments. **Computer System structures** – Computer system operation, I / O Structure, Storage structure, Storage hierarchy, Network structures. **Operating system structures** - System components, Operating systems services, System calls, System programs, System structure, Virtual machine, System design and implementation.

**Unit 2**

**Processes** – Process concepts, Process scheduling, Operations on Process, Cooperating Process, Inter Process communication in Client/ Server system. **Threads**- Multi threading models, Threading issues, Pthreads, Linux and Java Threads. **CPU Scheduling** – Basic concepts, Scheduling criteria, Scheduling algorithms, Multiple processor Scheduling, Real time Scheduling, Algorithm evaluation, Process Scheduling models. **Process Synchronization** – Critical section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical region, Monitors, OS Synchronization, Atomic transaction.**Deadlocks** – System models, Deadlocks characterization, Method for handling Deadlocks, Deadlock prevention, Deadlock avoidances, Deadlock detection, Recovery from Deadlocks.

**Unit 3**

**Memory management**- swapping, Contiguous memory allocation, Paging Segmentation, Segmentation with paging. **Virtual memory**- Demand paging, processes creation, page replacement, allocation of frames, thrashing. **File system interface and Implementation**- File concepts, access methods, directory structure, File system mounting, File sharing, Protection, File system structure, File system implementation, Directory implementation, Allocation methods, Free space managements, Efficiency and performance, Recovery , Log- structured file system, NFS.

**Unit 4**

**I / O Systems** - I / O hardware, Application I/O interface, Kernel I / O subsystem, Transforming I / O to hardware operations, STREAMS, Performances. **Mass storage structure** - Disk structure, Disk scheduling, Disk management, Swap space managements, RAID structure, Disk attachments, Stable storage implementation, Tertiary storage structure.

**Unit 5**

**Distributed Systems** – Motivation, Types of Distributed Operating systems. **Distributed file systems** – Background, Naming and transparency, Remote file access, Stateful versus stateless service, File replication. **Protection**- Goals and principles of protection, Domain of protection, Access matrix, Access control, Revocation of access rights, Capability based systems (Hydra), Language based protection( protection in java). **Security**- The security problem, Program threats, System and network threats.

**Text Book:**

1. Silberschatz, A., Galvin, P.B. & Gagne, G. “Operating System Concepts”, 6<sup>th</sup> Ed. Wiley-India.

**References:**

1. Dhamdhere, D. M. “Operating Systems”, 2<sup>nd</sup> Ed. The McGraw - Hill Companies.
2. Kochan, S, G., Wood, P., “Unix shell programming”, 3rd ed. Pearson Education, 2003
3. Ditel, Deital and Choffness, Operating Systems, Pearson, 3<sup>rd</sup>Edn

**MCS1C05 INTRODUCTION TO PROGRAMMING****Contact Hours/ week :4****Credit : 4****Unit 1**

Introduction to „ C“ programming –fundamentals – structure of a C program – compilation and linking processes – Constants, Variables – Data Types – Expressions using operators in C – Managing Input and Output operations – Decision Making and Branching – Looping. Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. String- String operations – String Arrays. Simple programs- sorting- searching – matrix operations.

**Unit 2**

Function – definition of function – Declaration of function – Pass by value – Pass by reference – Recursion. Pointers - Definition – Initialization – Pointers arithmetic – Pointers and arrays- Structure definition – Structure declaration – Structure within a structure - Union - Example programs. Storage classes, Pre-processor directives.

**Unit 3**

Introduction to OOP – overview of C++, Class, Object, inline functions, constructors, destructors, scope resolution operator, friend functions, friend classes, static members, *this* pointer, references, dynamic memory allocation.

**Unit 4**

Function overloading, overloading constructors, pointers to functions Operator overloading. Inheritance, types of inheritance, protected members, virtual base class, polymorphism, virtual functions, pure virtual functions.

**Unit5**

Streams, formatting I/O with class functions and manipulators, overloading << and >> , File I/O , name spaces, conversion functions, array based I/O, Standard Template Library (STL), Class templates and generic classes, function templates and generic functions.

**References:**

1. Kernighan,B.W and Ritchie,D.M, “The C Programming language”, 2<sup>nd</sup>Edn, Pearson Education, 2006
2. Balagurusamy, Programming in ANSI C, 5<sup>th</sup>edn, TMH.
3. Byron Gorrfried, Programming with C, 3<sup>rd</sup>Edn, Schaum’s outline.
4. Schildt, C++ - The complete Reference, 4<sup>th</sup>edn, McGraw Hill.
5. Somashekara, Guru, Nagendrasamy, Majunath, object Oriented Programming with C++, 2<sup>nd</sup>edn PHI
6. BjarneStroustrup - The C++ Programming language, Addison Wesley , 3<sup>rd</sup> Ed.

## MCS2C06 JAVA PROGRAMMING

**Contact Hours/ week : 3**

**Credit : 3**

**Unit 1**

Object oriented programming, basic concepts of OOP; Introduction to Java programming, features of Java: - Bytecode, Java Virtual Machine (JVM), Java Applets and Applications, Java file name and directory structure; Packages of Java API. Data Types, Variables, and Arrays, Type Conversion and Casting; Operators; Control Statements.

**Unit 2**

Class, Class Fundamentals, Declaring Objects, Constructors, access specifier, static, Nested and Inner Classes, Command-Line Arguments, this Keyword; Garbage Collection.String handling. Collection class.

Inheritance, method overloading, Method Overriding, Dynamic Method Dispatch, Abstract Classes.

**Unit 3**

Packages, Importing Packages; Interface: Defining an Interface, Implementing Interfaces; Exception Handling: try, catch, throw, throws, and finally, Java’s Built-in Exceptions; Thread, Synchronization, Messaging, Runnable interface, Inter thread communication, Deadlock, Suspending, Resuming and stopping threads, Multithreading. I/O streams, File streams.

**Unit 4**

Applets: Applet lifecycle, working with Applets, The HTML APPLET tag. Working with Graphics. Abstract Window Toolkit (AWT): AWT Classes, Window Fundamentals, Component, Container, Panel, Window, Frame. working with Frame Windows, AWT Controls, Layout Managers, and Menus.

**Unit 5**

Event Handling: Events, Event Sources, Event Classes, Event Listener Interfaces, Adapter Classes.

Java database connectivity:-jdbc architecture- drivers- database connections- statements- resultsets- transactions-metadata-stored procedures-error handling- blobs and clobs.

**Reference books:**

1. Herbert Schildt, The complete reference Java2 ,7<sup>th</sup>ed, Mc, Graw Hill.
2. David Flanagan, Java in a Nutshell A desktop quick Reference, 2 Edition, OReilly&Associates, Inc
3. Java programming, Rajkumar, pearson, 2013
4. Java Programming, HarimohanPandey, Pearson, 2012
5. Core Java for beginners, sha and sha, ShroffPubl and dist, 2010
6. Object Oriented Programming through Java, Rasdhakrishnan, University Press, 2007
7. Java for Programmers, 2<sup>nd</sup>Edn, Deital and Deital, Person

## **MCS2C07 DATA STRUCTURES & ALGORITHMS**

**Contact Hours/ week : 3**

**Credit : 3**

**Unit 1**

Abstract Data Types (ADT), Algorithm analysis, Asymptotic notations.

Arrays – representation. Polynomials with arrays – operations – addition and evaluation. Sparse matrix representation with arrays – operations- transpose and addition.

Linked list – Singly linked list (SLL) – basic operations (create list, add/delete nodes, traverse/print, search SLL, concatenate, merge two sorted SLLs, recursive function for reversing a SLL). Circular SLL – operations (add/delete nodes, print, concatenate, search). LL with header/trailer nodes. Doubly Linked List – basic operations (create list, add/delete nodes, traverse/print). Polynomials with SLL – addition and evaluation.

**Unit2**

Stack – array and Linked List implementation – applications – infix to postfix conversion – evaluation of postfix. Queue – array and Linked implementation – circular array Queue – Priority Queue – implementation with array and LL. Application of queues.

Non-linear data structures – tree and binary tree– basic definitions and properties –function to create binary tree - traversal – recursive and non-recursive, Print/traverse data level by level, count number of nodes.

**Unit3**

Threaded binary tree(TBT) – inorder threaded BT and function for inorder traversal of Inorder TBT. Binary search tree – create - add/delete nodes – search. Applications of trees.

AVL trees –B-Trees – Red-black trees (Basic ideas only).

Hashing - Hashing functions - Collision Resolution Techniques - Separate chaining - Open addressing – Multiple hashing.

**Unit 4**

Graph - Definitions – Representation of graph - Graph Traversals - Depth-first traversal – breadth-first traversal - applications of graphs – shortest-path algorithm – Dijkstra's algorithm -minimum spanning tree – Prim's and Kruskal's algorithms.

**Unit 5**

Sorting – Insertion, Quick and Heap.

Algorithms - Divide and Conquer – Merge Sort – Binary Search - Greedy Algorithms – Knapsack Problem – Dynamic Programming – Warshal’s Algorithm for Finding Transitive Closure – Backtracking – Sum of Subset Problem.

**Reference Books:**

1. Horowitz, Sahni and Mehta, Fundamentals of Data Structures in C++, 2<sup>nd</sup>Edn, University Press
2. Horowitz, Sahni, Rajasekaran, Fundamentals of Algorithms, 2<sup>nd</sup>Edn, University Press
3. M. A. Weis, Data Structures and Algorithm Analysis in C++, Pearson Education Asia, 2013
4. Langsam, Augenstein and Tenenbaum, Data Structures Using C and C++, 2<sup>nd</sup>edn, PHI.
5. Anany Leviton, Introduction to the Design and Analysis of Algorithms, 3rd Edition, Pearson Education.
6. Aho, Hopcroft and Ullman, Data Structures and Algorithms, Pearson Education.

## **MCS2C08 DATABASE MANAGEMENT SYSTEMS**

**Contact Hours/ week : 3**

**Credit : 3**

**Unit 1**

Database concepts, Relational database : Introduction to Relational model , relational algebra, views, tuple relational calculus, domain relational calculus, SQL- basic structure, set operations, sub queries, joint relation, DDL, DML, embedded SQL, QBE. Formal relational query language.

**Unit 2**

Database design : ER model basic concepts, constraints, Keys, ER diagram, Reduction of ER schema, UML, design of an ER database schema. Relational database design - 1st, 2nd, 3rd, 4th, BCNF, 5th Normal forms. Integrity and security, domain constraints, referential integrity, assertion, triggers, authorization in SQL, relational database design

**Unit 3**

Data storage and querying – storage and file structures, Indexing and hashing, basic concepts, static hashing, dynamic hashing, multiple key accesses, Query processing- Query optimization Transaction Management-Transaction concepts, transaction definition in SQL. Concurrency control, Recovery systems, deadlock handling.

**Unit 4**

Database system Architecture, Parallel databases, distributed databases, Data warehousing and mining- object based databases

**Unit 5**

Case study : PostgreSQL – data type – tables – psql – operations on tables – sub queries – views - operators & functions – indices – arrays – transactions and cursors, PostgreSQL Administration – authentication and Encryption – Database management – User and group management – PostgreSQL programming – Pl/pgSQL.

**Reference Books**

1. Silbersehatz, Korth and Sudarshan, Database system concepts, 6<sup>th</sup> edition MGH 2011
2. Ramakrishnan and Gehrke, Database Management Systems, 3rd Edn, McGraw Hill, 2003
3. A Leon & M Leon, Database Management Systems , Leon Vikas – 2003.
4. Elmasri and Navathe, Fundamentals of Database systems, 5<sup>th</sup> Edition ,Pearson 2009
5. O'Reilly, Practical PostgreSQLShroffPublishers(SPD) 2002

**MCS2C09 COMPUTER NETWORKS****Contact Hours/ week : 3****Credit : 3****Unit 1**

Introduction, network hardware, software, Reference Model, Internet, ATM, Physical Layer, Transmission Media, Wireless transmission, Switching – circuit switching, packet switching, message switching and hybrid switching - Communication Satellites.

**Unit 2**

Data Link Layer design issues, Error detection & correction, Elementary data link protocols, Sliding Window protocols, Data Link Layer in the Internet.

**Unit 3**

Medium access layer, Channel allocation problem, Multiple access protocols, Ethernet, Wireless LAN, Bluetooth.

**Unit 4**

Network Layer, Design Issues, Routing Algorithms, Congestion Control Algorithm, Internetworking, Internet Protocol, IP Address, Internet Control Protocol.

**Unit5**

Transport Layer, Design Issues, Connection Management – addressing, establishing and releasing a connection, Simple Transport Protocol, Internet Transport Protocol, E-mail, Network Security, Cryptography.

**Text book**

1. Andrews S. Tanenbaum. “Computer Networks”, 4<sup>th</sup> Edition, Prentice Hall of India, 2006.

**References Books**

1. Behrouz A Forouzan. “Data Communications and Networking”, 4<sup>th</sup> Edition, McGraw Hill, India, 2011.
2. William Stallings. “Data and Computer communications”, 7<sup>th</sup> Edition, Prentice Hall of India, 2004.
3. Kruse and Ross, Computer Networking, , 5<sup>th</sup>edn, Pearson



## MCS2C10 FORMAL LANGUAGES AND FINITE AUTOMATA

Contact Hours/ week : 3

Credit : 3

### Unit 1

**Introduction to the Theory of computation and Finite Automata:** Mathematical preliminaries and notation, Proof techniques, Three basic concepts: languages, grammar & automata. Some applications.

**Finite automata:** Deterministic Finite Acceptors, Nondeterministic Finite Acceptors, Equivalence of deterministic and nondeterministic finite acceptors, Reduction of the number of states in finite automata.

### Unit 2

**Regular Languages and Regular grammars :**Regular expressions, connection between regular expressions and regular languages , regular grammars

**Properties of Regular Languages:**closure properties of regular languages, identifying non regular language.

**Context-free grammars & languages**Context-free grammars, parsing and ambiguity.

### Unit 3

**Simplification of Context free Grammars and Normal forms :** methods of transforming grammars, two important normal forms.

**Pushdown automata for context-free languages**Non deterministic pushdown automata, PDA and context-free languages, deterministic pushdown automata and deterministic context-free languages.

### Unit 4

**Properties of Context-Free Languages:** pumping lemmas for context free languages and linear languages, closure properties for context-free languages.

**Turing machine**Standard Turing machine, combining Turing machines for complicated tasks, Turing's thesis

### Unit 5

**Other models of Turingmachine :** Minor variations on the Turing machine theme, Turing machine with complex storage, nondeterministic Turing machine, a universal Turing machine, Linear bounded automata.

**Limits of Algorithmic computation:** Problems that cannot be solved by Turing machines, Undecidable Problems for Recursively enumerable Languages, The Post Correspondence problem.

### Text Book :

1. An introduction to Formal Languages and Automata, Peter Linz, 4<sup>th</sup>edn, Narosa publishing House.

### Reference Books

1. John C Martin, Introduction to Languages and the Theory of Automata, McGraw Hill 1997
2. Mishra & Chandrasekharan, Theory of Computer Science : Automata, Languages and Computation, 3rd edn, PHI
3. Hopcroft, Motwani and Ullman, Introduction to automata theory, Languages and Computation, 3<sup>rd</sup>Edn., Pearson

## MCS3C12 COMPUTER GRAPHICS

**Contact Hours/ week : 3**

**Credit : 3**

### Unit 1

**Overview of Graphics systems:** Video display devices, Raster scan systems, Graphic workstations and viewing systems, Input devices, Graphics software, introduction to OpenGL.

**Graphics Output Primitives:** Coordinate reference frames, Line drawing algorithms (DDA and Bresenham's), OpenGL curve functions, Circle generating algorithms (Midpoint circle), Pixel addressing and Object geometry, fill area primitives, Polygon fill areas.

### Unit 2

**Attributes of graphics primitives :** Color and Gray scale, point attributes, Line attributes, Fill-Area attributes, General Scan-line polygon fill algorithm, Scan-Line fill of convex-polygons, Boundary fill and flood fill algorithms, Antialiasing.

**Two-dimensional viewing :** 2D viewing pipeline, Clipping window, normalization and viewport transformation, Clipping algorithms, point clipping, line clipping (Cohen-Sutherland, Nichol-Lee-Nichol), Polygon Fill-area clipping (Sutherland – Hodgeman).

### Unit 3

**Geometric Transformations:** Basic 2D transformation, Matrix representation and Homogeneous coordinates, Inverse transformations, 2D composite transformations, Reflection and shear, Raster methods for geometric transformations, Transformations between 2D coordinate systems. 3D Geometric transformations, 3D translation, 3D rotation (coordinate axis rotation, General 3-d rotation, Quaternion methods for 3D rotation), 3D scaling, 3D composite transformations, transformations between 3D coordinate systems.

### Unit 4

**Three-dimensional viewing :** Overview of 3D viewing concepts, 3D viewing pipeline, 3D viewing coordinate parameters, Transformation from world to viewing coordinates, Projection transformations, orthogonal projections (axonometric and isometric, orthogonal projection coordinates, clipping window and orthogonal projection view volume, Normalization transformation), Oblique parallel projections (Cavalier and cabinet projections, Clipping window and Oblique parallel-projection view volume, Oblique parallel projection transformation matrix, normalization transformation), Perspective projections (transformation coordinates, perspective-projection equations, vanishing points, view volume, transformation matrix, symmetric and oblique perspective-projection frustum, Normalized perspective-projection transformation coordinates), 3D clipping algorithms (region codes, point and line clipping, polygon clipping)..

### Unit5

**3D Object representation :** Quadric surfaces, superquadrics, blobby objects, spline representations.

**Visible surface detection methods :** Classification, Back-face detection, depth-Buffer method, A-buffer method. Wireframe visibility methods.

**Illumination models and surface rendering methods :**Light sources, Surface lighting effects, Basic illumination models (Ambient light, Diffuse reflection, Specular reflection and the Phong model), polygon rendering methods (constant intensity surface rendering, Gouraud surface rendering, Phong surface rendering), Ray tracing methods – basic Ray-tracing algorithm.

**Text Book :**

1. Hearn and Baker, Computer Graphics with OpenGL, 3<sup>rd</sup>edn, Pearson.

**Reference Books:**

1. Hill Jr. and Kelly, Computer Graphics using OpenGL, 3<sup>rd</sup>Edn, Pearson
2. Shreiner, Sellers, Kessenich, Licea-Kane, OpenGL programming guide, 8<sup>th</sup>edn, Pearson.
3. Foley, Van Dam, Feiner, Hughes, Computer Graphics- Principles and practice, Second Edition in C, Pearson Education.

**MCS3C13 SYSTEMS PROGRAMMING & COMPILER DESIGN****Contact Hours/ week : 3****Credit : 3****Unit 1**

Assemblers: Elements of Assembly Language Programming, Overview of Assembly Process, Design of Two pass Assembler, Macros and Macro Processors, Macro definition, call and expansion, Nested Macro calls, Advanced Macro facilities, Design of Macro preprocessor.

**Unit 2**

Linkers: Linking and Relocation concepts, Design of linkers, Self relocating programs, Linking for over-lays, Loaders. Introduction to compilers: Different Phases. Lexical Analysis:role of the lexical analyzer, input buffering, specification of tokens, Recognition of tokens, lexical Analyzer generators, Lex.

**Unit 3**

Syntax Analysis: role of the parser Context free grammar, writing a grammar, Top down parsing, Recursive descent parsing, Predictive parsing. Bottom Up Parsing, Shift Reduce parsing, Operator precedence parsing, LR parsers (SLR, Canonical and LALR). Parser generators, Yacc.

**Unit 4**

Syntax-directed translation – Syntax-directed definitions: S-attributed definition, L-attributed definition. Top-down and bottom-up translation, Type checking, Type systems, Specification of a type checker. Run time Environment:source language issues, storage organization Storage organization schemes, Activation records. Storage allocation strategies, Access to non-local names. Parameter passing mechanisms.Symbol tables.

**Unit 5**

Intermediate code generation, intermediate languages, declaration and assignment statements. Code generation: Issues, target machine, run time storage management, Runtime storage allocation, basic blocks and flow graphs. Code optimization: Principal sources of optimization.

**Text books:**

1. D.M. Dhamdhree, "Systems Programming and Operating Systems", TMH, 2003.
2. A.V. Aho, R. Semi, J.D. Ullman, "Compilers - Principles, techniques and tools", Pearson Education, 2003

**Reference books:**

1. A.V. Aho and J.D. Ullman, " Principles of Compiler Design", Narosa, 2002
2. Kenneth.C.Louden, Compiler Construction:Principles And Practice, Thomson Learning, India
3. Dave and Dave, Compilers – principles and practice, pearson, 2012
4. Lex and Yac, o'Reilly, 2<sup>nd</sup>Edn
5. Appel, Modern Compiler Implementation in C, Cambridge , 2012

## MCS3C14 SYSTEM ADMINISTRATION AND NETWORK PROGRAMMING

**Contact Hours/ week : 3**

**Credit : 3**

**Unit 1**

Introduction:Important parts of kernel; Major services in a UNIX system: init, login from terminals, syslog, periodic command execution cron and at;**Boot process:** The LILO boot process: LILO parameters, /etc/lilo.conf; The GRUB boot process; The /boot directory and files; initrd file and mkinitrd; Run levels: /etc/inittab, *start-up script /etc/rc.d/rc.sysinit*; **System Configuration:** The /etc/sysconfig/... files,*kernel modules*; kernel daemon; /etc/conf. modules and module parameters; /lib/modules/... directory structure and contents.

**Unit 2**

**File system configuration:** file system types, /etc/fstablayout and meaning; Basic user environment: /etc/skel/... and home directories, Window manager configuration file locations; **System Security:** Host security: tcp\_wrappers and /etc/hosts.allow and /etc/hosts. deny, /etc/security, shadow password, file permissions, users groups and umask; Adding and deleting users;**System maintenance:** Syslogd, klogd and /etc/syslog.conf; Using a remote syslog; The system crontab, daily script, tmpwatch and logrotate; Using and managing the system log files; Basic system backup and restore operations; Emergency rescue operations.

**Unit 3**

TCP / IP Network Configuration: Introduction to TCP / IP network, Protocols, IP address, Hostname, Configuring a Host : setting the host name, assigning IP address, broad cast, net mask and name server address, Editing Host and network files, Interface Configuration: loop back interface, Ethernet interface, The SLIP and PPP interface, Configuring Gateway, Routing through gateway, Network commands: ifconfig, netstat, route. Network applications Configuration: File Transfer Protocol (FTP) and Trivial File Transfer Protocol (TFTP), Network File Systems ( NFS) . Network Information System(NIS),Hyper Text Transfer Protocol (HTTP) and Web server, Server Message Block (SMB) Protocol and Samba server, Dynamic Host configuration Protocol (DHCP) Firewalls, Remote booting.

**Unit 4**

Domain Name Services (DNS) and Mail services: working of DNS, Host name Resolution Name lookup with DNS, Reverse Lookup, Domain Name Servers and Zones, DNS database: SOA, NS, MX, A and PTR records, Secondary and primary DNS, Zone change notification, root servers, internet root domains, configuring DNS, Using nslookup. Simple Mail Transfer Protocol (SMTP), Post office Protocol(POP) Multipurpose Internet Mail Extension (MIME), SMTP and POP3 command, Mail routing, Configuring A mail server.

**Unit 5**

Inter Process Communication programming : Create a process- fork() system call, Parent and Child Process, Process ID, User and Group ID Half Duplex Unix Pipes, Named Pipes, (First In First Out) , Streams and messages, System V IPC :Message Queues, Semaphores, Shared memory, Sample

programs for IPC that uses Pipes, FIFO;Socket Programming: Overview, socket address, Elementary Socket System Calls: socket, socket pair, bind, connect, listen,accept, send, sendto, recv, recvfrom, close, Byte ordering routines, Byte Operations, Address conversion routines, Simple client Programs that uses some reserved ports, Simple Client / Server Program using unreserved ports.

### Reference Books

1. Evi Nemeth ., et al, Linux Administration Hand Book , PHI 2003
2. Nicholas Wells, Linux Installation and Administration, Thomson Vikas 2000.
3. Olaf Kirch& Terry Dawson, Linux Network Administrators Guide, O'relly, 2003
4. Hunt, Linux DNS server Administration, BPB Publication, 2003
5. W Richard Stevens, Unix Network Programming, PHI, 2002

## MCS3C15 SOFTWARE ENGINEERING

**Contact Hours/ week : 3**

**Credit : 3**

### Unit 1

Software and Software Engineering: Nature of software and web apps, The software process, Software Engineering practice, Software myths.

Process Models: A generic process model, Prescriptive process model, Specialized process models, The unified process, Personal and team process models, Process technology, Product and process.

Agile Development: Agility- Agility and cost of change, Agile process, Extreme programming, Other agile process models.

### Unit 2

Project Management Concepts: The management spectrum, People, Product, Process, Project, W<sup>3</sup>HH principle.

Product Metrics:A framework for product metrics, Metrics for the requirements model, Metrics for the design model, Design metrics for Web apps, Metrics for Source code, Metrics for Testing, Metrics for maintenance.

Process and project Metrics:Metrics in the process and project domains, Software measurements, Metrics for software quality.

Estimation for Software Projects:Observations on estimation, The project planning process, Software scope and feasibility, Resources, Software project estimation, Decomposition techniques, Empirical estimation models, Specialized estimation techniques.

Project scheduling: Basic concepts, Project scheduling, Defining a task set for software project, Scheduling, Earned value analysis.

Risk Management: Reactive Vs proactive risk strategies, Software risks, Risk Identification, Risk projection, Risk refinement, Risk mitigation, Monitoring, Management, The RMMM plan.

### Unit 3

Quality Concepts: Software quality, Software quality dilemma, Achieving software quality.

Review Techniques: Cost impact of software defects, Defect amplification and removal, Review metrics and their use, Informal reviews, Formal technical reviews.

Software Quality Assurance: Elements of software quality assurance, SQA tasks, Goals and metrics, Formal approaches to SQA, Statistical quality assurance, Software reliability, The SQA plan.

Software Configuration Management: Software configuration management, The SCM process, Configuration management for web apps

Principles That Guide Practice: Software engineering knowledge, Core principles, Principles that guide each framework activity.

Understanding Requirements: Requirements engineering, Establishing the ground work, Eliciting requirements, Building requirements model, Negotiating requirements, Validating requirements.

#### **Unit 4**

Requirements Modeling: Flow, Behavior and Web Apps, Requirements modeling strategies, Flow oriented modeling, Creating a behavioral model, Requirements modeling for web apps.

Design Concepts: The design process, Design concepts, the design model. Software architecture, Architectural Design, Architectural mapping using dataflows.

Component Level Design: Cohesion, Coupling, Component level design for web apps, Component based development.

Use Interface Design: The golden rules, Use interface analysis and design, Interface analysis, Interface design steps, Web apps interface design, Design evaluation.

Web apps Design: Web apps design quality, Design goals, Design pyramid for web apps, Web apps interface design, Aesthetic design, Content design, Architecture design, Navigation design, Component level design.

#### **Unit 5**

Software Testing Strategies A strategic approach to software testing, strategic issues, Test strategies for conventional software, test strategies for web apps, Validation testing, system testing, The art of debugging.

Testing Conventional Applications: Software testing fundamentals, white box testing, Basis path testing, Control structure testing, Black box testing.

Testing Web Applications: Testing concepts for web apps, content testing, User interface testing, Component level testing, Navigation testing, Configuration, Performance and security testing.

Maintenance and Re Engineering: Software maintenance, Reengineering, Software reengineering, Reverse engineering, Restructuring, Forward engineering.

#### **Text book :**

1. Roger S. Pressman. Software Engineering – A practitioner's Approach, 7<sup>th</sup> Edition., McGraw Hill, 2010.

#### **Reference Books:**

2. Ian Somerville., Software Engineering., 9<sup>th</sup> Edition, Pearson , 2012.
3. Richard Fairley. , Software Engineering Concepts , TMH, 1997.
4. Pankaj Jalote., Software Engineering - A precise Approach, Wiley India, 2011
5. Ammann and Offcut, Introduction to Software Testing, Cambridge University Press, 2008

## **MCS3C16 RESEARCH METHODOLOGY**

**Contact Hours/ week :1+1**

**Credit : 1**

#### **Unit 1**

Introduction to Research Methodology : Meaning of Research, Objectives of Research, Motivations in Research, Types of Research, Research Approaches, Significance of Research, Research Process, Creativity and innovation, Thinking skills, Critical Thinking, Productive Thinking, Experimental Skills; Problem Solving Strategies, Logical thinking, Inductive and Deductive logic. Criteria of a good research, Defining the Research Problem: Selecting the Problem, Motivation behind the Problem definition, Techniques in defining the problem.

**Unit 2**

Research Ethics, Plagiarism, Research Formulation: Selecting the problem, Importance of literature review in selecting a problem, Literature review, primary and secondary sources, reviews, treatise, monographs, web as a source, searching the web.

**Unit 3**

Critical literature review, Identifying gap areas from literature review, Development of working hypothesis. Research Design: Planning and designing experiments, Critical Analysis

**Unit 4**

Structure and Components of Research Report, Data Presentation, Types of Report, Layout of Research Report, Mechanism of writing a research Thesis, Formats of a research paper (Science/ Engineering/ Technology research papers), IMRAD format, IEEE/ACM Professional Societies paper formats, Reference Citing Styles.

**Unit 5**

Publication Process: Peer review process, Open Access publications, other emerging trends in research communications, Shodhganga, Advanced academic search skills in Internet, Google Scholar, Scopus, Impact Factor, h-Index, g- index, Copyrights and Patents, IPR Laws.

**REFERENCES**

1. Kothari, C.R., "Research Methodology: Methods and Techniques", New Age Publisher, 2006.
2. Michael P. Marder, "Research Methods for Science", Cambridge University Press, 1<sup>st</sup> Ed., 2011.
3. Donald H. McBurney, "Research Methods", 5th Edition, Thomson Learning, 2006.
4. Ranjit Kumar, "Research Methodology: A Step-by-Step Guide for Beginners", SAGE Publications, 3<sup>rd</sup> Ed., 2010.

**SYLLABUS**  
**ELECTIVE COURSES**



### MCS3E01 DIGITAL SIGNAL PROCESSING

**Contact Hours/ week : 3**

**Credit : 3**

**Unit 1**

Introduction to discrete time signals & system – Discrete time signals and systems – Properties of discrete systems – linearity – time invariance – causality – stability – convolution – difference equation representation of discrete systems – The Z transform – properties of Z transform – the inverse Z transform – System function.

**Unit 2**

Discrete Fourier Transform & Fast Fourier Transform. Discrete Fourier series – properties – discrete Fourier transform – properties – block convolution – decimation in – time FFT algorithms – decimation in – frequency FFT algorithms.

**Unit 3**

FIR Digital Filters Realizations – direct – cascade – lattice forms – hardware implementation – FIR filter design using Fourier series – use of window functions – frequency sampling design.

**Unit 4**

IIR Digital Filters Realizations – Direct – Cascade – Parallel forms – hardware implementation – Analog filter approximations – Butterworth and Chebychev approximations – The method of mapping of differentials – impulse invariant transformation – Bilinear transformation – Matched Z transform technique.

**Unit 5**

Finite word length effects in digital filters – Fixed point arithmetic – Floating point arithmetic – Block floating point arithmetic – Truncation – Rounding – Quantization error in analog to digital conversion – finite register length effects in IIR & FIR filters Limit cycles. Digital signal processing application (Only brief description required)

**Reference Books:**

1. Oppenheim & Ronald W Schafer, Digital Signal Processing, Pearson
2. Andreas Antoniou , Digital Signal Processing, 1<sup>st</sup>Edn, TMH.
3. Andreas Antoniou ,“Digital Filters Analysis, Design & Applications, TMH.
4. R Rabiner & B. Gold , Theory & Application of Digital Signal processing, Prentice Hall India
5. SanjitK.Mithra , Digital Signal Processing, Tata Mc –Graw Hill
6. John G Proakis&Dimitris G Manolakis ,Digital Signal Processing , pearson
7. Kamen and Heck, Fundamentals of Signals and Systems using the Web and Matlab, 3<sup>rd</sup>edn, 2008, Pearson

### MCS3E02 PROBABILITY & STATISTICS

**Contact Hours/ week : 3**

**Credit : 3**

**Unit 1**

Probability distributions : Random variables, Binomial distribution, Hyper geometric distribution, Mean and variance of probability distribution, Chebysheve’s theorem, Poisson approximation to binomial, Poisson processes, Geometric distribution, Normal distribution, Normal approximation to Binomial distribution, Uniform distribution, Log-normal distribution, Gamma distribution, Beta distribution, Weibull distribution.

**Unit 2**

Sampling distributions and Inference Concerning Means :- Population and Samples, the sampling distribution of the mean, sampling distribution of variance, Point estimation, Bayesian estimation, Tests of Hypotheses, the null Hypotheses and the significance tests, Hypotheses concerning one mean, Operating characteristic curves, Inference concerning two means.

**Unit 3**

Inference concerning Variance and Proportions : Estimation of variances, Hypotheses concerning one variance, Hypotheses concerning two variances, Estimation of proportions, Bayesian estimation, Hypotheses concerning one proportion, Hypotheses concerning several proportions, analysis of rxc tables, Goodness of fit.

**Unit 4**

Correlation and Regression analysis: Curve fitting, the method of least squares, inference based on the least square estimators, curvilinear regression, correlation, Fisher's transformation, inference concerning correlation coefficient.

**Unit 5**

Analysis of variance :- General principles, Complexity randomized design, Randomized Block diagram, Multiple comparison, Some further experimental designs, Analysis of covariance.

**Reference Books:**

1. Johnson, Probability and Statistics for Engineers (V Edn), Miller & Freund
2. Levin & Rubin, Statistics for Management, PHI
3. Milton & Arnold, Probabilities in engineering and Computer Sciences, MGH
4. Ross, Introduction to Probability and Statistics for engineers and Scientists, John Wiley & Sons
5. Frank & Althoen, Statistics – concepts and Applications, Cambridge University press
6. Walpole et. al., Probability and Statistics for Engineers & Scientists, 8<sup>th</sup> Edn, Pearson

**MCS3E03 FUZZY SYSTEMS****Contact Hours/ week : 3****Credit : 3****Unit 1**

**Introduction:** Fuzzy systems – Historical perspective, Utility and limitations, uncertainty and information, fuzzy sets and membership, Chance vs Fuzziness.

**Classical sets and Fuzzy sets:** Classical set (Operations, properties, mapping to functions). Fuzzy sets (Operations, properties, Alternative fuzzy set operations).

**Unit 2**

**Classical Relations and Fuzzy relations:** Cartesian product, crisp relations (cardinality, operations, properties, composition), Fuzzy relations (cardinality, operations, properties, Fuzzy Cartesian products and composition), Tolerance and equivalence relation, Crisp equivalence and tolerance relations, Fuzzy tolerance and equivalence relations, value assignments (Cosine amplitude, Max-min method), other similarity methods, other forms of composition Operation.

**Unit 3**

**Properties of membership functions, Fuzzification and Defuzzification:** Features of the membership functions, various forms, Fuzzification, defuzzification to crisp sets,  $\lambda$ -cuts for fuzzy relations, Defuzzification to scalars.

**Logic and Fuzzy systems:** Classical logic, proof, Fuzzy logic, approximate reasoning, other forms of the implication operation. Natural language, Linguistic hedges, Fuzzy rule based systems, Graphical techniques for inference.

**Unit 4**

**Development of membership functions:** Membership value assignments (intuition, inference, rank ordering, Neural network, Genetic algorithm, inductive reasoning.)

**Extension Principle:** Crisp functions, mapping and relations, Functions of Fuzzy sets – extension principle, Fuzzy transform, practical considerations.

**Unit 5**

**Fuzzy arithmetic:** Interval analysis, Approximate methods of extension – DSW and restricted DSW algorithms.

**Fuzzy classification:** Classification by equivalence relation (crisp and Fuzzy), Cluster analysis, cluster validity, C-means clustering (Hard and Fuzzy), Fuzzy c-means algorithm.

**Reference books**

1. Ross, Fuzzy Logic with Engineering Applications, 3<sup>rd</sup>Edn, Wiley India.
2. Hajek P, Metamathematics of Fuzzy Logic. Kluwer, 1998
3. Rajasekharan and Viajayalakshmi, Neural Networks, Fuzzy Logic and Genetic Algorithm, PHI, 2003.
4. Sivanandan and Deepa, Principles of Soft Computing, John wiley and Sons, 2007.

**MCS3E04 DESIGN AND ANALYSIS OF ALGORITHMS****Contact Hours/ week : 3****Credit : 3****Unit 1**

Introduction, recursive algorithms, time and space complexities, randomized algorithms, repeated element, primality testing.

Divide and conquer- general method, finding maximum and minimum, merge sort, quick sort, selection, Strassen's matrix multiplication, convex hull algorithm.

**Unit 2**

Greedy method : general method, knapsack problem, tree vertex splitting, job sequencing with dead lines, optimal storage on tapes.

**Unit 3.**

Dynamic programming : General method, multistage graphs, all pairs shortest paths, dfs, bfs, connected components, biconnected components and dfs.

**Unit 4**

Back tracking : general method, 8 queens, sum of subsets, graph colouring, Hamilton cycles.

Branch and bound : General method, traveling salesperson problem.

**Unit 5**

Lower bound theory, comparison trees, Oracles and advisory arguments, Lower bounds through reduction, Basic concepts of Np – Hard and Np – Complete problems.

**Reference books:**

1. Horowitz, Sahni & Rajasekaran, Fundamentals of Computer algorithms, 2<sup>nd</sup>edn, University Press.
2. Aho, Hopcroft, Ullman, The Design and analysis of computer algorithms, Pearson
3. Baase and Gelder, Computer Algorithms Introduction to Design and analysis, 3<sup>rd</sup>edn, Pearson, 2000
4. A Levitin, Introduction to the Design and analysis of algorithms, 2<sup>nd</sup>edn, Person.

## MCS3E05 INFORMATION SECURITY

**Contact Hours/ week : 3**

**Credit : 3**

### Unit 1

Foundations of Cryptography and security: Ciphers and secret messages, security attacks and services.

Classical Encryption techniques (Symmetric cipher model, substitution techniques, transposition techniques), steganography.

Mathematics for cryptography: Euclid's algorithm, modular arithmetic, Linear congruence, Groups, rings and fields, finite fields, polynomial arithmetic.

### Unit 2

Block cipher principles – The data encryption standard (DES) – strength of DES – Differential and linear cryptanalysis – Block cipher design principles.

Advanced encryption standard – AES structure – AES transformation function – key expansion – implementation.

Block cipher operations – Multiple encryption – ECB – CBC – CFM – OFM – Counter mode.

Pseudo Random Number generators - design of stream cipher, RC4.

### Unit 3

Public Key cryptography: Prime numbers and testing for primality, factoring large numbers, discrete logarithms.

Principles of public-key crypto systems - RSA algorithm.

Diffi-Helman Key exchange, ElGamal Cryptographic systems - elliptic curve arithmetic, elliptic curve cryptography.

Hash functions – examples – application – requirements and security – Hash function based on Cipher block chaining – Secure Hash algorithm.

### Unit 4

Message authentication requirements - Message authentication functions – requirements of message authentication codes - MAC security – HMAC – DAA – CCM – GCM.

Digital signatures, ElGamal and Schnorr Digital signature schemes, Digital signature standard.

### Unit 5

Key management and distribution – Symmetric key distribution using symmetric and asymmetric encryption. Distribution of public keys, Public Key Infrastructure,

User Authentication: Kerberos.

Electronic mail security: Pretty Good Privacy, S/MIME.

IP and Web security protocols :secure socket layer and transport layer security, HTTPS – IP security overview and policy.

Firewall and Intrusion Detection: virus and related threats, virus counter measures, intrusion detection and password management, firewall design principles.

### Reference books

1. William Stallings, Cryptography and Network Security, Pearson 2004
2. Foorouzan and Mukhopadhyay, Cryptography and Network security, 2<sup>nd</sup> edn
3. Bruce Schneier., Applied cryptography – protocols and algorithms, Springer Verlag 2003
4. William Stallings, Network Security Essentials, , 4<sup>th</sup> edn, Pearson
5. Pfleeger and Pfleeger, Security in Computing, 4<sup>th</sup> Edn, Pearson

## MCS4E06 DIGITAL IMAGE PROCESSING

**Contact Hours/ week : 3**

**Credit : 3**

### Unit 1

Steps in Digital image Processing, Elements of Visual perception, Image Sensing and Acquisition, Image sampling and quantization, Basic pixel relationships, Basic Intensity Transformation functions – Negatives, Log transforms, Power law transformations, Piecewise Linear Transformation functions.

### Unit 2

Histogram processing, Fundamentals of spatial filtering, Smoothing spatial filters, Sharpening spatial filters.

**Filtering in the Frequency domain** : DFT of one and two variables, Properties of 2-D DFT, Basics of filtering in the Frequency domain. Image smoothing filters (Ideal Lowpass, Gaussian Lowpass), Image sharpening filters (ideal Highpass, Gaussian Highpass, Laplacian in the Frequency domain. Selective filtering – Notch filters.

### Unit 3

**Image restoration and reconstruction** : Model, noise models, restoration in the presence of noise only – spatial filtering, Periodic noise reduction by frequency domain filtering.

Linear, Position – invariant degradation.

Color models – RGB and HIS.

### Unit 4

**Image compression** : Fundamentals, Compression methods (Huffman, Arithmetic coding, LZW coding, run Length coding, Wavelet coding). Digital watermarking.

**Morphological Image Processing**: Erosion and dilation, opening and closing, Hit-or-miss transformation, Morphological algorithms (Boundary extraction, Thinning, thickening, skeletons, pruning).

### Unit 5

**Image segmentation** : Fundamentals, Point and line and edge detection, Thresholding, Region-based thresholding.

**Representation and description** : Representation – Boundary following and chain codes, skeletons. Boundary descriptors – Simple descriptors, shape numbers. Regional descriptors – simple descriptors.

#### Text Book :

1. Gonzalez and Woods, Digital Image Processing, 3<sup>rd</sup>Edn, Pearson.

#### Reference Book:

1. Anil K. Jain, Fundamentals of Digital image Processing, Prentice Hall, US Ed., 1989.
2. William K. Pratt, Digital Image Processing: PIKS Scientific Inside, Wiley Interscience, 4th Ed., 2007
3. Bernd Jahne, Digital Image Processing, Springer, 6th Ed., 1997
4. Sonka, Hlavac, Boyle, Digital Image Processing and Computer Vision, Cengage, 2008

## MCS4E07 DIGITAL SPEECH PROCESSING

**Contact Hours/ week : 3**

**Credit : 3**

### **Unit 1**

Introduction to speech recognition: Introduction- the paradigm for speech recognition –history of speech recognition research, The speech signal: speech production mechanism, perception-acoustic phonetic characterization and classification- the speech production process- representing speech in time frequency domains-speech sounds and features. Approaches to automatic speech recognition by machine, speech recognition in adverse environment.

### **Unit 2**

Signal Processing and Analysis Methods for Speech Recognition: Introduction- The Bank of Filters Front End Processor- Linear Predictive Coding for Speech Recognition- Vector Quantization, Time domain parameters of speech, methods for extracting the parameters, zero crossing, auto correlation function, pitch estimation.

### **Unit 3**

Pattern Comparisons Techniques: Introduction- Speech Detection- Distortion Measures - Spectral Distortion Measures. Incorporation of Spectral Dynamic Features into Distortion Measures- Time Alignment Normalization. Speech Recognition System Design and Implementation Issues: Introduction, Application of Source Coding Techniques to Recognition- Template Training Methods- Performance Analysis and Recognition Enhancements- Discriminative Methods in Speech Recognition.

### **Unit 4**

**Large Vocabulary Continuous Speech Recognition:** Introduction, Subword Speech units, Subword Unit Models Based On HMMs, training of Subword Units, Language Models for Large Vocabulary Speech Recognition, Statistical Language Modeling, Perplexity of the Language Model, Overall recognition System Based on Subword Units, Context-Dependent Subword Units, Creation of Vocabulary-Independent Units, Semantic Postprocessor for recognition

### **Unit5**

**Task Oriented Applications of Automatic Speech Recognition:** Introduction, Speech-Recognizer Performance Scores, Characteristics of Speech- Recognition Applications, Broad Classes of Speech-Recognition Applications, Command-and-Control Applications, Projections for Speech recognition. **Speaker Verification:** Introduction, Acoustic Parameters, Similarity Measures, Text- Dependent Speaker Verification, Text- Independent Speaker Verification, Text-Prompted Speaker Verification, Identification, Verification and the Decision Threshold.

### **Reference Book:**

1. Lawrence Rabiner, Biing-Hwang Juang, Fundamentals of Speech Recognition, Prentice Hall.
2. Ben Gold and Nelson Morgan, Speech and Audio Signal Processing- John Willey & sons, 2011.
3. L R Rabiner and Schafer, Digital processing of speech signals, Prentice hall. 1978.
4. Jurafsky and Martin, Speech and Language Processing – An introduction to Natural Language Processing, Computational Linguistics, and Speech recognition, 2013, Pearson

## MCS4E08 OPERATIONS RESEARCH

**Contact Hours/ week : 3**

**Credit : 3**

### Unit 1

Linear programming: Formulation, Graphical Solution-2 variables, Development of Simplex Method, Artificial Variable Techniques, Big- M method, Two-Phase method, Reversed Simplex method.

### Unit 2

Duality in LPP and its formulation, Dual Simplex Method, Bounded variable method, Applications of LPP, Transportation problems, Assignment Problem, Traveling Sales persons problem.

### Unit 3

Integer Programming problem (IPP), Cutting Plane algorithm, Branch and bound method of solving IPP, Dynamic programming problems and its characteristics, Deterministic Dynamic Programming Problem.

### Unit 4

Sequencing Problem, Processing n jobs through two machines and their mechanics, Processing n jobs through m machines, Processing 2 jobs through m machines, Project scheduling by PERT / CPM, Difference between PERT / CPM, Constructing the network, Critical path analysis, Float of an activity, Three time estimated for PERT, project cost by CPM.

### Unit 5

Stochastic process, Classification of stochastic process, Discrete parameter Markov chains, Continuous Parameter Markov Chains, Birth and Death Processes, Queuing model and its characteristics, Classification of Queuing Model (M/M/1): FCFS(birth and death model)z//.

### Reference Books

1. Thaha H.A.- Operation Research, 9<sup>TH</sup>Edn, Pearson
2. Sharm J.K, Mathematical Models in Operation Research, TMGH, 1989.
3. Trivedi, . Probability, Statistics with Reliability, Queuing and Computer Science Applications, PHI
4. Winston, Operations Research Applications and Algorithms, 4<sup>th</sup>edn, CENGAGE, 2003

## MCS4E09 LINUX KERNEL

**Contact Hours/ week : 3**

**Credit : 3**

### Unit 1

Introduction: Characteristics, multi-tasking, multi-user access, multiprocessing, architecture independence, demand load executable, paging, dynamic cache for hard disk, shared libraries, POSIX 1003.1 support, various formats for executable files, Memory protected mode, support for national keyboards and fonts, different file systems, TCP/IP, SLIP and PPP *support*; Compiling the kernel; Configuration facilities; Kernel architecture; Processes and tasks; Important data structures, task structure, process table, files and inodes, dynamic memory management, queues and semaphores, system time and timers; Main algorithms, signals, interrupts, booting the system, timer interrupt, scheduler; System call, working, getpid, nice, pause, fork, execve, exit, wait; Implementing new system calls.

**Unit 2**

Memory Management: Architecture independent memory model; Pages of memory; Virtual address space; Converting the linear address; Page directory; page middle directory; page table; Virtual address space; user segment; virtual memory areas; brk system call; Mapping functions; Kernel segment; Static and dynamic memory allocation in the kernel segment; Block device caching; Block buffering; update and bdflush processes; Buffer cache list structures; Paging; Page cache and management; Finding free page; reloading a page.

**Unit 3**

Inter-process communication: Synchronization; Communication via files, locking; Pipes; System V IPC, access permissions, numbers and keys, semaphores, message queues, shared memory, ipcs and ipcrm commands; IPC with sockets; Unix domain socket implementation.

**Unit 4**

File System: Basic principles; Representation in the kernel; Mounting; Superblock operations; Inode; Inode operations; File structure; File operations; File opening; Directory cache; Proc file system; Ext2 file system; Structure; Directories in ext2 file system; block allocation.

**Unit 5**

Device Drivers: Character and block devices; Polling and interrupts; Interrupt mode; Interrupt sharing; Bottom halves; Task queues; DMA mode; Hardware detection; Automatic interrupt detection; Driver implementation; setup function; init; open and release; read and write; IOCTL; select; lseek; mmap; readdir; fsync and fasync; check\_media\_change and revalidate.

**Reference books:**

1. M beck , Linux Kernel Internals, Second edition, Addison Wesley. 1998
2. Robert Love, Linux Kernel Development, SAMS, 2003
3. Bovet and Cesati, Understanding the Linux Kernel, 3<sup>rd</sup>Edn, O'Reilly

**MCS4E10 SIMULATION AND MODELING****Contact Hours/ week : 3****Credit : 3****Unit 1**

Introduction: simulation, Merits and demerits, Areas of application, System and Environment, Components of System, Discrete and Continuous systems, types of models. Steps in simulation study, Simulation Examples, Concepts in Discrete event simulation, Event scheduling Vs Time advance algorithms. Manual simulation Using Event Scheduling, List processing. Simulation in Java, Simulation in GPSS.

**Unit 2**

Statistical Models: Useful statistical model, Discrete distribution, Continuous distribution, Queuing Models: Characteristics of queuing systems, queuing notations, long run measures of performance of queuing systems, Steady state behavior of Markovian models (M/G/1, M/M/1, M/M/c), Steady state behavior of finite population models, Network of Queues.

**Unit 3**

Random Numbers: Roles of random numbers in simulation, pseudo random number generation techniques- there properties, methods of testing PRN sequence. Random Varieties: Generation, Inverse transformation techniques, Acceptance Rejection techniques, Direct transformation technique and Convolution method.



**Unit 4**

Input Modeling: Data collection, identifying the Distribution, parameter estimation, Goodness of fit tests. Input models without data, Multivariate and Time series input models. Verification and Validation of Models: Model building, Verification, and Validation, Verification of simulation models, Calibration and Validation of models.

**Unit 5**

Output Analysis for a Single Model: Types of simulations with respect to output analysis, Stochastic nature of output data, Measure of performance and their estimation, Output analysis of terminating simulators, Output analysis for steady state simulation. Comparison and Evaluation of Alternative System Design: Comparison of two system design, Comparison of several system design, Meta modeling, Optimization via simulation.

*Case Studies: Simulation of manufacturing systems, Simulation of computer systems, Simulation of super market, Simulation of pert network.*

**Text book:**

1. Jerry Banks. John S. Carson & Barry L. Nelson - Discrete Event system simulation PHI India 2001.

**Reference books:**

1. Geoffrey Gordon, System Simulation, 2nd Edition, Prentice Hall, India, 2002.
2. N.Deo System simulations with Digital computers, PHI 1979.
3. James A Payne, Introduction to Simulation : Programming Techniques & Methods of Analysis MGH 1988 .
4. Sengupta , System Simulation and Modeling, Pearson, 2014

**MCS4E11 MOBILE COMPUTING****Contact Hours/ week : 3****Credit : 3****Unit 1**

Introduction to Mobile computing: Functions, types of networks, architecture for mobile computing, design considerations for mobile computing.

**Unit 2**

Evolution of telephony, multiple access procedures, satellite communication systems, mobile computing through telephone, IVR, Voice XML, Bluetooth, RFID, WiMAX, Mobile IP, IPv6.

**Unit 3**

GSM – architecture, entities, call routing, PLMN interfaces, GSM addresses and identifiers, network aspects in GSM, mobility management, GSM frequency allocation, authentication and security. SMS –architecture and types. GPRS – GPRS and packet data network, GPRS network architecture, GPRS network operations, Data services in GPRS.

**Unit 4**

WAP – WAP protocol stack, WAP application environment, WML & WMLScript, WAP Push architecture, Protocols used in WAP, WAP Gateway. CDMA & 3G – Spread-Spectrum Technology, CDMA v/s GSM, IS-95 standards, 802.11 standards, Third generation networks and applications on 3G, WLAN architecture.

**Unit 5**

Voice over IP – H.323 Framework, SIP, Real time protocols, Convergence technologies, Call routing, VoIP applications, Mobile VoIP, Voice over WLAN.

**Text Book:**

1. Asoke Talukder, Hasan Ahmed, and Roopa Yavagal. Mobile Computing, Technology, Applications and Service Creation, 2d Edition, McGraw Hill Education (India) Pvt. Ltd., New Delhi. 2010.

**Reference Books:**

1. Raj Kamal. Mobile Computing, Oxford University Press. 2007.
2. Iti Saha Misra. Wireless Communications and Networks, 3G and Beyond, Tata McGraw Hill Education Pvt. Ltd., New Delhi. 2009.
3. Schiller, Mobile communication, 2<sup>nd</sup> edn, Pearson
4. Perahia and Stacey, Next Generation Wireless LANs, Cambridge, 2009
5. Shende, Mobile computing for beginners, Shroff Publ & Distributers, 2012
6. Reeza B'Far, Mobile computing principles, Cambridge, 2005

**MCS4E12 PATTERN RECOGNITION****Contact Hours/ week : 3****Credit : 3****Unit 1**

Pattern Classifier – Over view of Pattern recognition – discriminant functions - Supervised learning - Parametric estimation – Maximum Likelihood estimation - Bayesian Parametric estimation – Perceptron Algorithm – LMSE algorithm – Problems with Bayes approach – Pattern classification by Distance functions- minimum distance Pattern classifier.

**Unit 2**

Unsupervised classifications - clustering for unsupervised learning and classification – Clustering concept – C means algorithm – Hierarchical clustering procedures – Graph theoretic approach to pattern clustering – Validity of clustering solutions.

**Unit 3**

Structural Pattern recognition - Elements of formal Grammars – String generation as Pattern description – Recognition of syntactic description – Parsing – Stochastic Grammars and Applications – Graph based structural representation.

**Unit 4**

Feature extraction and selection – Entropy minimization – Karhunen – Loeve Transformation – Feature selection through functions approximation – Binary feature selection.

**Unit 5**

Recent Advances- Neural network structures for Pattern Recognition - Neural network based pattern associators- Unsupervised learning in Neural Pattern Recognition - Self organizing networks - Fuzzy logic- Fuzzy pattern classifiers – Pattern classification using Genetic algorithms.

**Reference Books:**

1. R. J. Schalkoff, Pattern Recognition : Statistical, Structural and Neural approaches, Wiley Student Edn, 1992.
2. Tou and Gonzalez, Pattern Recognition Principles, Addison Wesley, 1974.
3. Duda, Hart and Stork, Pattern Classification, 2<sup>nd</sup>Edn, John Wiley and Sons
4. Morton Nadler, Eric P Smith, Pattern Recognition Engineering, Wiley, 1993.

### **MCS4E13 ARTIFICIAL NEURAL NETWORKS**

**Contact Hours/ week : 3**

**Credit : 3**

**Unit 1**

Fundamental concepts, Evolution, Basic models of ANN, Terminologies, MP neurons, Linear Separability, Hebb network.

**Unit 2**

**Supervised Learning Networks:** Perceptron networks, Adaptive Linear Neuron, Multiple Adaptive Linear Neurons, Back Propagation Networks.

**Unit 3**

**Associative Memory Networks:** Training algorithms for pattern classification, Autoassociative memory network, Hetroassociative memory network, BAM, Hopfield Net.

**Unit 4**

**Unsupervised Learning Networks:** Fixed weights competitive nets, Kohonen Self-Organizing Maps, Learning Vector quantization.

**Unit 5**

**Unsupervised Learning Networks (contd):** Counter propagation networks, Adaptive Resonance theory Networks.

**Text Book :**

1. Sivavndan, Deepa, Principles of Soft Computing, 2<sup>nd</sup>Edn, Wiley India.

**Reference Book:**

2. B. Yegnanarayana, Artificial Neural Networks, PHI
3. Rajasekharan and Viajayalakshmipai, Neural Networks, Fuzzy Logic and Genetic Algorithm, PHI, 2003
4. Satish Kumar, Neural Networks a class room approach, 2<sup>nd</sup>Edn, McGraw Hill.

### **MCS4E14 HIGH PERFORMANCE COMPUTING**

**Contact Hours/ week : 3**

**Credit : 3**

**Unit 1: Parallel Processing Concept**

Levels of parallelism (instruction, transaction, task, thread, memory, function)- Models (SIMD, MIMD, SIMT, SPMD, Dataflow Models, Demand-driven Computation etc)- Architectures: N-wide superscalar architectures, multi-core, multi-threaded

**Unit 2: Parallel Programming with CUDA**

Processor Architecture, Interconnect, Communication, Memory Organization, and Programming Models in high performance computing architectures: (Examples: IBM CELL BE, Nvidia Tesla GPU, Intel Larrabee Microarchitecture and Intel Nehalem microarchitecture- Memory hierarchy and transaction specific memory design- Thread Organization

**Unit 3: Fundamental Design Issues in Parallel Computing**

Synchronization- Scheduling- Job Allocation-Job Partitioning- Dependency Analysis- Mapping Parallel Algorithms onto Parallel Architectures- Performance Analysis of Parallel Algorithms

**Unit 4: Fundamental Limitations Facing Parallel Computing and power aware techniques**

Bandwidth Limitations- Latency Limitations- Latency Hiding/Tolerating Techniques and their limitations- Power-aware Processing Techniques-Power-aware Memory Design- Power-aware Interconnect Design-Software Power Management.

**Unit 5: Advanced Topics**

Petascale Computing-Optics in Parallel Computing- Quantum Computers- Recent developments in Nanotechnology and its impact on HPC

**References**

1. George S. Almasi and Alan Gottlieb, Highly Parallel Computing, Benjamin Cumming Publishers.
2. Kai Hwang ,Advanced Computer Architecture: Parallelism, Scalability, Programmability, McGraw Hill 1993
3. David Culler, Jaswinder Pal Singh, Anoop Gupta, Parallel Computer Architecture: A hardware/Software Approach, Morgan Kaufmann, 1999.
4. K. Hwang& Z. Xu, Scalable Parallel Computing – Technology, Architecture, Programming., McGraw Hill 1998.
5. William James Dally and Brian Towles, Principles and Practices on Interconnection Networks, Morgan Kauffman 2004.
6. Hubert Nguyen , GPU Gems 3, Addison Wesley, 2008, (Chapter 29 to Chapter 41)
7. Ananth Grama, Anshul Gupta, George Karypis, and Vipin Kumar, Introduction to Parallel Computing, , 2nd edition, Pearson, 2003.
8. David A. Bader (Ed.), Petascale Computing: Algorithms and Applications, Chapman & Hall/CRC, 2008.

**MCS4E15 VISUAL CRYPTOGRAPHY**

**Contact Hours/ week : 3**

**Credit : 3**

**UNIT 1**

Digital image Processing: Fundamentals:- Digital Image Representation-coordinate conversions, images as matrices, Image Types- intensity images, binary images, RGB images; Color Image Processing:-, Colour Image Representation- RGB model, CMY model, CMYK model, HSI model. Image file formats.

**UNIT 2**

Principles of steganography and digital watermarking and their applications.

Secret Sharing- Introduction,History of secret sharing, principle of secret splitting, phases of secret sharing, Access Structures, Threshold Schemes, Shamir's Scheme, Applications.

**UNIT 3**

Visual Cryptography- Introduction- History of Visual Cryptography, Construction of Visual Cryptography Schemes, basis matrices, Construction of 2-out-of-2 Visual Cryptography Schemes,

Construction of 2-out-of-2 Visual Cryptography Schemes with Square Pixel Expansion, Construction of Visual Cryptography Schemes with Consistent Image Size.

#### **UNIT 4**

Visual Cryptography Schemes- Construction of 2-out-of-n Visual Cryptography Schemes, Basis Matrices for 2-out-of-n Visual Cryptography Schemes, Construction of n-out-of-n Visual Cryptography Schemes, Basis Matrices for n-out-of-n Visual Cryptography Schemes, Construction of k-out-of-n Visual Cryptography Schemes, Basis Matrices for k-out-of-n Visual Cryptography Schemes.

#### **UNIT 5**

Colour Visual Cryptography – subpixel layout of colour visual cryptography, Variations of colour visual cryptography Schemes- Constructing a ‘2 out of 2’ colour Visual Cryptography Schemes, Constructing a ‘2 out of n’ colour Visual Cryptography Schemes, Applications of Visual Cryptography.

#### **References**

1. BorkoFurht, EdinMuharemagic and Daniel Socek, Multimedia Encryption and Watermarking, Springer.
2. Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing, Pearson Education.
3. Jen- Shyang Pan, Hsiang- Cheh Huang and Lakhi C. Jain, Intelligent Watermarking Techniques, World Scientific.
4. Josef Pieprzyk, Thomas hardjino and Jennifer Seberry, Fundamentals of computer security, Springer International Edition 2008.

### **MCS4E16 LINUX DEVICE DRIVERS**

**Contact Hours/ week : 3**

**Credit : 3**

#### **Unit 1**

An introduction to Device Drivers: The role of the device driver, Splitting the kernel, Classes of devices and modules, Security issues.

Building and running modules: Kernel modules Vs applications, User space and kernel space, Concurrency in kernel, Current process, Compiling and loading, The kernel symbol table, Error handling in init\_module, Usage count, I/O ports and I/O memory, Advantages and disadvantages of user space.

#### **Unit 2**

Char Drivers: Major and minor numbers, Dynamic allocation of major numbers, Removing a driver from the system, dev\_t and kdev\_t, File operations, File structure, open and release, Introduction to race conditions, Read and write, Device file system.

Enhanced Character driver operations: ioctl, Blocking I/O, Poll and select, Asynchronous notification.

Flow of Time: Time intervals in kernel, Knowing the current time, Delaying execution, Task queues, Kernel timers.

#### **Unit 3**

Hardware Management: I/O Ports and I/O Memory, Using I/O ports, Using digital I/O ports, An overview of parallel ports, Using I/O memory.

Interrupt Handling: Overall control of interrupts, Installing an interrupt handler, Implementing a handler, Tasklets and bottom half processing, Tasklets, The BH mechanism, Interrupt sharing, Interrupt driven I/O, Race conditions, Circular buffers, Spin locks, Lock variables.

Kmod and Advanced Modularization: Loading modules on demand, Requesting modules in the kernel, The use space side, Module loading and security, Intermodule communication.

#### **Unit 4**

Mmap and DMA: Memory management in Linux, Address types, High and low memory, The memory map and struct page, page Tables, Virtual memory areas, The mmap device operation, The kiobuf interface, Direct memory accessing and Bus mastering.

Network Drivers: Connecting to the kernel, Thenet\_device structure, Opening and closing, Packet Transmission, Controlling transmission concurrency, Packet reception, The interrupt handler, The socket buffers, MAC address resolution, Multicasting.

#### **Unit 5**

Overview of Peripheral Buses: The PCI Interface, PCI Addressing, PCI Interrupts, PC/104, PC/104+, MCA, EISA, SBus, NuBus, External Buses, USB.

Physical Layout of The Kernel Source: Booting the kernel, Theinit process, The kernel directory, The fs directory, The mm directory, The net directory, ipc and lib, Drivers.

#### **Reference Books:**

1. Alessandro Rubini and Jonathan Corbet. "Linux Device Drivers. ", 3<sup>rd</sup>edn. O'Reilly.
2. S. Venkateswaran, Essential Linux Device Drivers, Pearson Edn, 2008.

## **MCS4E17 DATA MINING**

**Contact Hours/ week : 3**

**Credit : 3**

#### **Unit 1:**

Introduction – kinds of data and patterns – technologies, applications, major issues.

Data objects and attribute types – statistical descriptors of data – Data visualization, measuring data similarity and dissimilarity.

Data preprocessing – data cleaning - data integration - data reduction – data transformation and discretization.

#### **Unit 2:**

Data warehouse – Basic concepts – DW modeling (Data cube and OLAP), Design & usage, Implementation, Data generalization by attribute oriented induction

Mining frequent patterns – basic concepts - frequentitemset mining methods, Pattern Evaluation methods.

#### **Unit 3:**

Classification and prediction – basic concepts, Decision tree induction – Bayes classification – rule based classification – model evaluation and selection – Techniques to improve classification accuracy.

#### **Unit 4:**

Advanced classification methods – Bayesian Belief networks, Back propagation – Using frequent patterns, Lazy learners.

Cluster analysis - categorization – partitioning methods – hierarchical methods – density based methods – grid based methods – evaluation of clustering .

**Unit 5:**

Probabilistic Model based clustering.

Outlier detection – outliers and outlier analysis – outlier detection methods – statistical and proximity based approaches..

Overview of spatial, multimedia, text and web mining.

**Text book:**

1. J. Han, M. Kamber & J. Pei, Data Mining - Concepts and Techniques, 3<sup>rd</sup>Edn, Morgan Kauffman, 2012.

**Reference Books:**

1. K.P. Soman, ShyamDiwakar and V. Ajay, Insight into Data mining Theory and Practice, Prentice Hall of India, 2006.
2. Alex Berson and Stephen J. Smith, Data Warehousing, Data Mining & OLAP”, Tata McGraw – Hill, 2007.
3. G. K. Gupta, Introduction to Data Mining with Case Studies, 2<sup>nd</sup>edn, PHI.
4. Witten, Frank and Hall, Data Mining – Practical Machine Learning Tools and Techniques, 3<sup>rd</sup> Edition, Morgan Kauffman, 2011.
5. A K Pujari, Data Mining Techniques, 2<sup>nd</sup>edn, Universities Press, 2013.

## MCS4E18 NATURAL LANGUAGE PROCESSING

**Contact Hours/ week : 3**

**Credit : 3**

**Unit 1**

Morphology and Finite State transducers, N – grams.

**Unit 2**

Word classes and part of speech tagging, Context free grammars for English, Parsing with context free grammars.

**Unit 3**

Features and Unifications, Lexicalized and Probabilistic parsing.

**Unit 4**

Semantics: Representing meaning, Semantic analysis, Lexical semantics, Word Scene Disambiguation and Information retrieval.

**Unit 5**

Pragmatics: Discourse, Dialog and Conversational Agents, Natural Language Generation, Machine Translation.

**Text book :**

1. Jurafsky and Martin, Speech and Language Processing, Pearson, 2013

**Reference Books:**

1. Allen, James, Natural Language Understanding, Second Edition, Benjamin/Cumming, 1995

2. Charniack, Eugene, Statistical Language Learning, MIT Press, 1993.
3. Manning, Christopher and Heinrich, Schutze, Foundations of Statistical Natural Language Processing, MIT Press
4. Kao, Natural Language Processing and Text Mining, Springer

## **MCS4E19 CYBER FORENSICS**

**Contact Hours/ week : 3**

**Credit : 3**

### **UNIT 1**

Computer Forensics Fundamentals: What is Computer Forensics?, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists.

Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement - Computer Forensic Technology - Types of Business Computer Forensic Technology Computer Forensics Evidence and Capture: Data Recovery Defined -Data Back-up and Recovery-The Role of Back-up in Data Recovery - The Data- Recovery Solution.

### **UNIT 2**

Evidence Collection and Data Seizure: Why Collect Evidence? Collection Options obstacles-- Types of Evidence - The Rules of Evidence-Volatile Evidence - General Procedure - Collection and Archiving - Methods of Collection -Artifacts - Collection Steps - Controlling Contamination: The Chain of Custody. Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene – Computer Evidence Processing Steps - Legal Aspects of Collecting and Preserving Computer Forensic Evidence Computer Image Verification and Authentication: Special Needs of Evidential Authentication – Practical Consideration -Practical Implementation

### **UNIT3**

Computer Forensics analysis and validation: Determining what data to collect and analyze, validating forensic *data*. addressing data-hiding techniques, performing remote acquisitions Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project.

Processing Crime and Incident Scenes: Identifying digital evidence. collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case.

### **UNIT 4**

Current Computer Forensic tools: evaluating computer forensic tool needs, computer I/O forensics software tools, computer forensics hardware tools, validating and testing forensics software

E-Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in email, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools

Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

### **UNIT5**

Working with Windows and DOS Systems: understanding file systems, exploring Microsoft File Structures. Examining NTFS disks. Understanding whole disk encryption, windows registry. NTFS Microsoft startup tasks. MS-DOS startup tasks, virtual machines.

### **Reference Books:**

1. Jhon R. Vacca, Computer Forensics, Computer Crime Investigation, Firewall Media, New Delhi.



2. Nelson. Phillips Enfinger. Stuart, Computer Forensics and Investigations, CENGAGE Learning
3. Britz, Computer Forensics and Cyber Crime – An Introduction, 2<sup>nd</sup>Edn, Pearson.

## **MCS4E20 ARTIFICIAL INTELLIGENCE**

**Contact Hours/ week : 3**

**Credit : 3**

### **UNIT 1**

Introduction - Overview of AI applications. Introduction to representation and search.  
The Propositional calculus, Predicate Calculus, Using Inference Rules to produce Predicate Calculus expressions, Application – A Logic based financial advisor.

### **UNIT 2**

Introduction to structure and Strategies for State Space search, Graph theory, Strategies for state space search, Using the State Space to Represent Reasoning with the Predicate calculus (State space description of a logical system, AND/OR Graph).  
Heuristic Search : introduction, Hill-Climbing and Dynamic Programming, The Best-first Search Algorithm, Admissibility, Monotonicity and informedness, Using Heuristics in Games.

### **UNIT 3**

Building Control Algorithm for Statespace search – Introduction, Production Systems, The blackboard architecture for Problem solving.  
Knowledge Representation – Issues, History of AI representational schemes, Conceptual Graphs, Alternatives to explicit Representation, Agent based and distributed problem solving.

### **UNIT 4**

Strong Method Problem Solving – Introduction, Overview of Expert System Technology, Rule Based Expert system, Model -Based, Case-Based and Hybrid Systems (Introduction to Model based reasoning, Introduction to Case Based Reasoning, Hybrid design), Introduction to Planning.  
Reasoning in Uncertain Situation – introduction, logic based Abductive Inference.  
Introduction to PROLOG , Syntax for predicate Calculus programming, ADTs, A production system example.

### **UNIT 5**

Machine Learning: Symbol Based – Introduction, Frame –work. The ID3 Decision tree Induction algorithm. Inductive bias and Learnability, Knowledge and Learning, Unsupervised learning, Reinforcement Learning,  
Machine Learning : Connectionist – Introduction, foundations, Perceptron learning.  
Machine learning : Social and emergent: Models, The Genetic Algorithm, Artificial Life and Social based Learning.

### **Text book :**

1. George F Luger, Artificial Intelligence – Structures and Strategies for Complex problem solving, 5<sup>th</sup>Edn, Pearson.

### **Reference Books:**

1. E. Rich, K. Knight, S B Nair, Artificial intelligence, 3<sup>rd</sup>Edn, McGraw Hill.
2. S. Russel and p. Norvig, Artificial intelligence – A Modern Approach, 3<sup>rd</sup>Edn, Pearson
3. D W Patterson, introduction to Artificial Intelligence and Expert Systems, PHI, 1990

## **Syllabus – Lab Courses**

**MCS1P01 Lab I (IP/OS)****Hours/Week : 8 +2****Credit : 3****Section A – Introduction to Programming (C & C++) (5 +2 Hours / Week)**

Faculty-in-charge shall prepare a list of experiments at the beginning of the semester. For the ESE, question will be selected from this list. All exercises must be done under Linux environment.

| <b>Sr No</b> | <b>Topic /Description</b>                                                               | <b>Minimum Number of Programs</b> |
|--------------|-----------------------------------------------------------------------------------------|-----------------------------------|
| 1            | If and switch statements.                                                               | 1                                 |
| 2            | Using Loops                                                                             | 2                                 |
| 3            | String manipulation                                                                     | 1                                 |
| 4            | Search                                                                                  | 1                                 |
| 5            | Sort                                                                                    | 1                                 |
| 6            | Matrix operations                                                                       | 2                                 |
| 7            | Functions                                                                               | 2                                 |
| 8            | Pointer                                                                                 | 2                                 |
| 9            | Structure / Union                                                                       | 2                                 |
| 10           | Class, constructors, destructors – simple programs                                      | 5                                 |
| 11           | Friend function                                                                         | 1                                 |
| 12           | Friend class                                                                            | 1                                 |
| 13           | Function overloading                                                                    | 1                                 |
| 14           | Operator overloading                                                                    | 1                                 |
| 15           | Programs illustrating Inheritance , Virtual base class, Polymorphism, virtual functions | 3                                 |
| 16           | C++ Files                                                                               | 1                                 |
| 17           | STL                                                                                     | 1                                 |
| 18           | C++ I/O based exercises                                                                 | 2                                 |
|              | Total                                                                                   | 30                                |

**Section B : Operating System (3 hours per week)**

Faculty-in-charge shall prepare a list of experiments at the beginning of the semester. Use C/C++ for high level programming.

- i. Linux basic and essential commands
- ii. Editors in Linux
- iii. Linux Shell programming : minimum 5 programs
- iv. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
- v. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
- vi. Implement memory management schemes (Minimum two schemes).

**ESE Scheme of evaluation**

|                                        |             |
|----------------------------------------|-------------|
| 1. Record of work done duly certified  | : 10        |
| 2. C program                           | : 20        |
| 3. C++ program                         | : 20        |
| 4. Viva based on C/C++                 | : 10        |
| 5. Linux shell program                 | : 10        |
| 6. Viva based on Linux lab assignments | : 10        |
| <b>Total</b>                           | <b>: 80</b> |

For 2,3 and 5:

Program writing : 5

Execution without errors: 5

Output : 5

Questions based on the program and/or Modification: 5

**MCS2P02 Lab II (Java/DS/DBMS)****Hours/Week :7 +1****Credit : 3****Section A– JavaProgramming ( 2 +1 Hours per week)**

Faculty-in-charge shall prepare a list of experiments, based on the topics specified below, at the beginning of the semester. For the ESE, question will be selected from this list. All exercises must be done under Linux environment.

| <b>Sr No</b> | <b>Topic / Description</b>                                       | <b>Minimum Number of Programs</b> |
|--------------|------------------------------------------------------------------|-----------------------------------|
| 1            | Simple programs employing class – covering basic class concepts. | 2                                 |
| 2            | Nested and Inner class                                           | 1                                 |
| 3            | String manipulation                                              | 1                                 |
| 4            | Command line arguments                                           | 1                                 |
| 5            | Inheritance, Method overloading /overriding, Abstract class      | 3                                 |
| 6            | Packages – Covering important concepts in package                | 2                                 |
| 7            | Exception handling                                               | 1                                 |
| 8            | Thread and multi-threaded applications                           | 3                                 |
| 9            | Applet                                                           | 2                                 |
| 10           | AWT                                                              | 2                                 |
| 11           | Event driven programs                                            | 2                                 |
| 12           | Database connectivity - jdbc                                     | 2                                 |
|              | Total                                                            | 22                                |

**Section B : Data Structures (3 hours per week)**

Faculty-in-charge shall prepare a list of experiments at the beginning of the semester. Use C++ under Linux for implementation. Employ class concepts and features of C++ in all exercises.

| <b>Sr No</b> | <b>Topic / Description</b>                  | <b>Minimum Number of Programs</b> |
|--------------|---------------------------------------------|-----------------------------------|
| 1            | Polynomial representation and operations    | 1                                 |
| 2            | Sparse matrix representation and operations | 1                                 |

|    |                                                |    |
|----|------------------------------------------------|----|
| 3  | Singly linked list                             | 3  |
| 4  | Doubly linked list                             | 1  |
| 5  | Stack/Queue with SLL                           | 1  |
| 6  | Infix to postfix                               | 1  |
| 7  | Postfix evaluation                             | 1  |
| 8  | Circular array queue                           | 1  |
| 9  | Create Binary tree                             | 1  |
| 10 | Recursive tree traversal                       | 1  |
| 11 | Non-recursive tree traversal                   | 1  |
| 12 | Threaded Binary tree                           | 1  |
| 13 | Binary search tree                             | 1  |
| 14 | AVL tree / Hashing                             | 1  |
| 15 | Dijkstra's algorithm/ Prim's algorithm/Kruskal | 1  |
| 16 | Quick sort / merge sort                        | 2  |
| 17 | Heap sort / Warshal's algorithm                | 1  |
|    | Total                                          | 20 |

### Section C : Database Management Systems (2 Hours per week)

Faculty-in-charge shall prepare a list of experiments at the beginning of the semester. Use PostgreSQL for the lab exercises. ESE questions will be set based on the list provided by the faculty-in-charge. Exercises shall include the following components:

1. Create databases and tables, different types of Constraints, SQL queries to add/delete/retrieve data.
2. SQL queries : Update, modify, Alter, Join, nested queries etc.
3. Index, operators and functions, views, arrays, transactions, cursors, triggers, etc.
4. PostgreSQL Administration
5. PostgreSQL Programming - Pl/pgSQL
6. Case study – design of database for a simple application like payroll and its implementation.

### ESE Scheme of evaluation

- |                                       |      |
|---------------------------------------|------|
| 1. Record of work done duly certified | : 10 |
| 2. Java or DS program                 | : 30 |
| 3. DBMS                               | : 20 |

50

4. Viva : 20

**Total : 80**

For 2:

Program writing :7

Execution without errors: 8

Output/Correctness : 8

Questions based on the program and/or Modification: 7

For 3

Program/Query writing : 5

Execution without errors: 5

Output/Correctness : 5

Questions based on the program/problem and/or Modification: 5

**MCS3P04 Lab III (CG/NP&A/SP&CD)****Hours/Week :6 +2****Credit : 3****Section A – Computer Graphics( 2 +1 Hours per week)**

Faculty-in-charge shall prepare a list of experiments, based on the topics specified below, at the beginning of the semester. For the ESE, question will be selected from this list. All exercises must be done using OpenGL (under Windows or linux).

| <b>Sr No</b> | <b>Topic / Description</b>                                                                                     | <b>Minimum Number of Programs</b> |
|--------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 1            | OpenGL Point and Line functions with different attributes<br>Simple OpenGL programs with I/O and Mouse support | 2                                 |
| 2            | Line drawing algorithms                                                                                        | 2                                 |
| 3            | Circle Drawing                                                                                                 | 1                                 |
| 4            | Line Clipping                                                                                                  | 1                                 |
| 5            | Polygon Clipping                                                                                               | 1                                 |
| 6            | 2D transformations                                                                                             | 1                                 |
| 7            | 3D View based                                                                                                  | 2                                 |
| 8            | 3D transformations                                                                                             | 1                                 |
| 9            | 3D object representations                                                                                      | 1                                 |
| 10           | Visible surface detection methods                                                                              | 1                                 |
| 11           | Illumination / Rendering                                                                                       | 1                                 |
|              | Total                                                                                                          | 14                                |



**Section B : Network Programming and System Administration (2+1 hours per week)**

Faculty-in-charge shall prepare a detailed description of experiments.

| <b>Sr No</b> | <b>Topic / Description</b>                 |
|--------------|--------------------------------------------|
| 1            | Configuration : FTP, TFTP, IP address      |
| 2            | Configuring NIS                            |
| 3            | Configuring DHCP.                          |
| 4            | Configuring SAMBA server.                  |
| 5            | Setting Domain Name Services.              |
| 6            | SMTP and POP3                              |
| 7            | TCP chat program.                          |
| 8            | UDP chat program.                          |
| 9            | Socket program.                            |
| 10           | Configuring NFS.                           |
| 11           | LILO configuration                         |
| 12           | Crontab, at, Batch.                        |
| 13           | Kernel modules                             |
| 14           | Run levels                                 |
| 15           | TCP - wrappers                             |
| 16           | Changing file permission, group and owner. |
| 17           | Syslog.conf                                |
| 18           | Backup (tar, cpio, dd etc.)                |
| 19           | Rescue operations.                         |

**Section C : System Programming and Compiler Design (2 Hours per week)**

Implement the following:

| Sr No | Topic / Description                                                                                         |
|-------|-------------------------------------------------------------------------------------------------------------|
| 1     | Simple Assembler                                                                                            |
| 2     | Using Lex and Yacc - validation of expressions, validation of variable names, implementation of calculator. |
| 3     | Implementing any three parsing algorithm                                                                    |
| 4     | Implement Symbol Table                                                                                      |
| 5     | Intermediate code Generator                                                                                 |
| 6     | Code Optimizer.                                                                                             |

**ESE Scheme of evaluation**

- |                                                                     |      |
|---------------------------------------------------------------------|------|
| 1. Record of work done duly certified                               | : 10 |
| 2. CG program                                                       | : 20 |
| 3. NP & A                                                           | : 20 |
| 4. Viva based on CG and NP&A exercises                              | : 15 |
| 5. Execution of selected exercise from SP&CD and Viva based on that | : 15 |

**Total : 80**

For 2 and 3

Program writing : 5

Execution without errors: 5

Output/Correctness : 5

Questions based on the program/problem and/or Modification: 5

**MCS2P03 Case Study I and MCS3P05 Case Study II****Hours/Week : 3+2****Credit : 2**

The objective of the course is to inculcate self-learning skill in mastering software development tools. The department shall select one or more of Development tools such as .Net, Python, HTML/PHP/JavaScript, Android and Matlab. The teacher-in-charge shall give an overview of the tool and if required arrange for lectures by external experts. The teacher may also help the students to find online tutorials/courses. A set of lab assignment shall be prepared by the teacher. Each student is expected to solve a problem using the tool(s) selected. Unlike project work, the focus should be on coding and testing of programs. A report with the statement of problem, description of solution, code and output is to be submitted for the external evaluation.

**ESE Scheme of evaluation**

1. Report duly certified : 10
2. Demonstration of the software : 15
3. Viva based on the Tool and Software : 15

**MODEL QUESTIONS**  
**I & II SEMESTER**

| INSTRUCTIONS TO QUESTION PAPER SETTER                                                                                                                                                                                   |                   |                                |                   |                                                                 |                                              |                                                          |                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------------|-------------------|-----------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|-------------------|
| Semester : 1                                                                                                                                                                                                            |                   |                                |                   | Course : MCS1C01 DISCRETE MATHEMATICS                           |                                              |                                                          |                   |
| Section A                                                                                                                                                                                                               |                   |                                |                   | Section B                                                       |                                              |                                                          |                   |
| Total no of questions                                                                                                                                                                                                   | Mark per question | No of questions to be answered | Time per question | Total no of questions                                           | Mark per question                            | No of questions to be answered                           | Time per question |
| 12                                                                                                                                                                                                                      | 3                 | 10<br>$10 \times 3 = 30$       | 5 to 8 minutes    | 5 either-or questions - each containing two parts - (a) and (b) | 10 marks per each part<br>$5 \times 10 = 50$ | All five questions selecting one part from each question | 20 to 25 minutes  |
| UNIT WISE DISTRIBUTION                                                                                                                                                                                                  |                   |                                |                   |                                                                 |                                              |                                                          |                   |
| UNIT                                                                                                                                                                                                                    |                   | SECTION A                      |                   | SECTION B                                                       |                                              |                                                          |                   |
| 1                                                                                                                                                                                                                       |                   | 3                              |                   | 1                                                               |                                              |                                                          |                   |
| 2                                                                                                                                                                                                                       |                   | 3                              |                   | 1                                                               |                                              |                                                          |                   |
| 3                                                                                                                                                                                                                       |                   | 2                              |                   | 1                                                               |                                              |                                                          |                   |
| 4                                                                                                                                                                                                                       |                   | 2                              |                   | 1                                                               |                                              |                                                          |                   |
| 5                                                                                                                                                                                                                       |                   | 2                              |                   | 1                                                               |                                              |                                                          |                   |
| Note:                                                                                                                                                                                                                   |                   |                                |                   |                                                                 |                                              |                                                          |                   |
| <p>At least 60% of the questions should be problems.<br/> The questions shall include simple/direct questions ( approximately 30%), Average / moderate difficulty (40%) and Challenging / difficult questions 930%)</p> |                   |                                |                   |                                                                 |                                              |                                                          |                   |

### Model Question

#### FIRST SEMESTER M Sc Computer Science DEGREE EXAMINATION

#### MCS1C01 DISCRETE MATHEMATICS

Time: 3 Hrs

Max Marks: 80

#### Section A

Answer any ten questions. Each question carries three marks.

1. Write the following statements in symbolic form:

i. x is the father of mother of y.

ii. All men are mortal

2. Construct the truth table for  $(P \rightarrow Q) \wedge (Q \rightarrow P)$

3. Show that  $P \Rightarrow (P \vee Q)$

4. Show that  $A \cup_{i=1}^n B_i = \bigcap_{i=1}^n (A \cup B_i)$

5. Let  $X = \{1, 2, 3, 4\}$  and R be the relation defined on the set X as  $R = \{ \langle x, y \rangle, x \leq y \}$ . Write the relation matrix.

6. Find the power set of  $\{1, 2, 3, \{1, 2, 3\}\}$

7. Find the value of n, if  $P(n, 7) = 12P(n, 5)$ .

8. Neethu has 5 friends, in how many ways can she invite two or more of them to a tea party.
9. Four dice are thrown simultaneously. Find the probability that all of them show the same face.
10. What is a subring? Find subring of  $\langle \mathbf{I}, +, \cdot \rangle$ , where  $\mathbf{I}$  is the set of Integers.
11. Define Bipartite graph. Give example.
12. Define the terms walk, path, trail and circuit.

**(10 x 3 = 30 marks)**

### Section B

**Answer all questions. Each question carries ten marks.**

13. a) Explain the different measures used in accessing the performance of computer systems.  
OR  
b) i. Explain the role of stacks.  
ii. Explain instruction sequencing. (4+6)
14. a) Give a detailed account of Interrupts in relation to IO operations.  
OR  
b) Give a detailed account of USB standard.
15. a) Explain 3-bus organization of processors.  
OR  
b) With suitable example explain Booth algorithm.
16. a) Explain the organization and working of virtual memory.  
OR  
b) Discuss different cache mapping techniques.
17. a) Discuss the major issues related to pipelining.  
OR  
b) Explain the basic organization and advantages of Vector processing and shared memory multiprocessors.

**(5 x 10 = 50 marks)**

| INSTRUCTIONS TO QUESTION PAPER SETTER |                   |                                |                   |                                                                 |                                              |                                                          |                   |
|---------------------------------------|-------------------|--------------------------------|-------------------|-----------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|-------------------|
| Semester : 1                          |                   |                                |                   | Course : MCS1C02COMPUTER ORGANIZATION AND ARCHITECTURE          |                                              |                                                          |                   |
| Section A                             |                   |                                |                   | Section B                                                       |                                              |                                                          |                   |
| Total no of questions                 | Mark per question | No of questions to be answered | Time per question | Total no of questions                                           | Mark per question                            | No of questions to be answered                           | Time per question |
| 12                                    | 3                 | 10<br>$10 \times 3 = 30$       | 5 to 8 minutes    | 5 either-or questions - each containing two parts - (a) and (b) | 10 marks per each part<br>$5 \times 10 = 50$ | All five questions selecting one part from each question | 20 to 25 minutes  |
| UNIT WISE DISTRIBUTION                |                   |                                |                   |                                                                 |                                              |                                                          |                   |
| UNIT                                  |                   | SECTION A                      |                   | SECTION B                                                       |                                              |                                                          |                   |
| 1                                     |                   | 2                              |                   | 1                                                               |                                              |                                                          |                   |
| 2                                     |                   | 2                              |                   | 1                                                               |                                              |                                                          |                   |
| 3                                     |                   | 3                              |                   | 1                                                               |                                              |                                                          |                   |
| 4                                     |                   | 3                              |                   | 1                                                               |                                              |                                                          |                   |
| 5                                     |                   | 2                              |                   | 1                                                               |                                              |                                                          |                   |

### Model Question

#### FIRST SEMESTER M Sc Computer Science DEGREE EXAMINATION

#### MCS1C02 COMPUTER ORGANIZATION AND ARCHITECTURE

Time: 3 Hrs

Max Marks: 80

#### Section A

Answer any ten questions. Each question carries three marks.

1. With suitable example explain 2's complement scheme for signed integer representation.
2. Compare CISC and RISC.
3. What do you mean by bus arbitration?
4. Differentiate between program controlled IO and Interrupt driven IO.
5. Explain fetch-execute cycle.
6. How will store floating point numbers?
7. Give the basic principle of array multiplier.
8. Give the memory hierarchy.
9. What are the different types of DRAMs?
10. Explain any one page replacement strategy used in Cache memory.
11. Explain the idea of hardware multithreading.
12. List the advantages of pipeline processing.

(10 x 3 = 30 marks)

#### Section B

Answer all questions. Each question carries ten marks.

13. a) Explain the different measures used in accessing the performance of computer systems.

OR

b) i. Explain the role of stacks.

ii. Explain instruction sequencing.

(4+6)

14. a) Give a detailed account of Interrupts in relation to IO operations.

OR

b) Give a detailed account of USB standard.

15. a) Explain 3-bus organization of processors.

OR

b) With suitable example explain Booth algorithm.

16. a) Explain the organization and working of virtual memory.

OR

b) Discuss different cache mapping techniques.

17. a) Discuss the major issues related to pipelining.

OR

b) Explain the basic organization and advantages of Vector processing and shared memory multiprocessors.

**(5 x 10 = 50 marks)**



| <b>INSTRUCTIONS TO QUESTION PAPER SETTER</b> |                          |                                       |                          |                                                                 |                                              |                                                          |                          |
|----------------------------------------------|--------------------------|---------------------------------------|--------------------------|-----------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|--------------------------|
| <b>Semester : 1</b>                          |                          |                                       |                          | <b>Course : MCS1C03 DIGITAL SYSTEMS &amp; MICROPROCESSORS</b>   |                                              |                                                          |                          |
| <b>Section A</b>                             |                          |                                       |                          | <b>Section B</b>                                                |                                              |                                                          |                          |
| <b>Total no of questions</b>                 | <b>Mark per question</b> | <b>No of questions to be answered</b> | <b>Time per question</b> | <b>Total no of questions</b>                                    | <b>Mark per question</b>                     | <b>No of questions to be answered</b>                    | <b>Time per question</b> |
| 12                                           | 3                        | 10<br>$10 \times 3 = 30$              | 5 to 8 minutes           | 5 either-or questions - each containing two parts - (a) and (b) | 10 marks per each part<br>$5 \times 10 = 50$ | All five questions selecting one part from each question | 20 to 25 minutes         |
| <b>UNIT WISE DISTRIBUTION</b>                |                          |                                       |                          |                                                                 |                                              |                                                          |                          |
| <b>UNIT</b>                                  |                          | <b>SECTION A</b>                      |                          | <b>SECTION B</b>                                                |                                              |                                                          |                          |
| 1                                            |                          | 3                                     |                          | 1                                                               |                                              |                                                          |                          |
| 2                                            |                          | 3                                     |                          | 1                                                               |                                              |                                                          |                          |
| 3                                            |                          | 2                                     |                          | 1                                                               |                                              |                                                          |                          |
| 4                                            |                          | 2                                     |                          | 1                                                               |                                              |                                                          |                          |
| 5                                            |                          | 2                                     |                          | 1                                                               |                                              |                                                          |                          |

**Model Question****FIRST SEMESTER M Sc Computer Science DEGREE EXAMINATION****MCS1C03 DIGITAL SYSTEMS & MICROPROCESSORS****Time: 3 Hrs****Max Marks: 80****Section A****Answer any ten questions. Each question carries three marks.**

1. Show that complement of EX-OR is equal to its dual.
2. Discuss the main differences between SOP and POS circuits and their implementation.
3. What is the underlying principle of K-Map and Tabular method simplification? Illustrate with examples.
4. Show how a 2 to 4 decoder circuit can be modified to 1 to 4 Dmux.
5. What is Master-Slave Flip flop?
6. What are the disadvantages of ripple counters and how they are overcome?
7. What is addressing mode in a processor. List the different addressing modes in 8085 processor?
8. Explain the complete functioning of the following instructions in 8085 processor:
  - i) ADD B
  - ii) RST1
9. Give the Flag register of 8086.
10. What are assembler directives?
11. Explain the protection mechanism used in advanced processors.
12. What is the concept of page mode in 80386 processor?

(10 x 3 = 30 marks)

**Section B****Answer all questions. Each question carries ten marks.**

13. a) i. Simplify the following function using K-Map and draw the simplified circuit.  
 $F(w,x,y,z)=\Sigma(0,1,2,3,7,8,10)$  and  $d(w,x,y,z)=\Sigma(5,6,11,15)$   
 ii. Draw the circuit of a 4 bit parallel adder. 6+4  
 OR
- b) i. Explain how parity is used for error checking. Show a scheme to generate even parity and transmission and checking at receiving end.  
 ii. Simplify the following boolean function using Tabular method finding the essential prime implicants and draw the circuit:  
 $F(A,B,C,D) = \Sigma(0,2,3,5,7,8,10,11,14,15)$  4+6
14. a) Discuss the design of a Mod 10 counter.  
 OR
- b) i. With the help of a block diagram, explain the working of serial to parallel shift register.  
 ii. With the help of a block diagram, explain the working of JK flip flop. 6+4
15. a) Explain the architecture of 8085 microprocessor.  
 OR
- b) i. Explain the different operations taking place in each machine cycles while a CALL instruction is executed  
 ii. Draw the structure of register corresponding to SIM instruction and explain each bit. 6+4
16. a) Explain the architecture of 8086 microprocessor.  
 OR
- b) Explain organization and working of 8255.
17. a) i. Compare 386 and 486 processors.  
 ii. Explain the memory management unit of advanced processors. 4+6  
 OR
- b) Discuss the special features of Pentium processors.

(5 x 10 = 50 marks)

| INSTRUCTIONS TO QUESTION PAPER SETTER           |                   |                                |                   |                                                                 |                                       |                                                          |                   |
|-------------------------------------------------|-------------------|--------------------------------|-------------------|-----------------------------------------------------------------|---------------------------------------|----------------------------------------------------------|-------------------|
| Semester : 1 Course : MCS1C04 OPERATING SYSTEMS |                   |                                |                   |                                                                 |                                       |                                                          |                   |
| Section A                                       |                   |                                |                   | Section B                                                       |                                       |                                                          |                   |
| Total no of questions                           | Mark per question | No of questions to be answered | Time per question | Total no of questions                                           | Mark per question                     | No of questions to be answered                           | Time per question |
| 12                                              | 3                 | 10<br>10 x 3 = 30              | 5 to 8 minutes    | 5 either-or questions - each containing two parts - (a) and (b) | 10 marks per each part<br>5 x 10 = 50 | All five questions selecting one part from each question | 20 to 25 minutes  |
| UNIT WISE DISTRIBUTION                          |                   |                                |                   |                                                                 |                                       |                                                          |                   |
| UNIT                                            |                   | SECTION A                      |                   | SECTION B                                                       |                                       |                                                          |                   |
| 1                                               |                   | 2                              |                   | 1                                                               |                                       |                                                          |                   |
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### Model Question

#### FIRST SEMESTER M Sc Computer Science DEGREE EXAMINATION

#### MCS1C04 OPERATING SYSTEMS

Time: 3 Hrs

Max Marks: 80

#### Section A

Answer any ten questions. Each question carries three marks.

- List the salient features of Real-time systems.
- What do you mean by system calls? Give any two examples.
- Explain the concept of multithreading.
- Define "Critical section" and "Semaphores".
- Explain the CPU scheduling criteria.
- Explain Thrashing.
- Explain the relevance of Virtual memory concept in modern operating systems.
- Compare Windows and Linux directory structure.
- Explain the basic principle of RAID.
- Explain "STREAMS".
- List the distinguishing features of Distributed Operating systems.
- Explain the terms Stateful and stateless services.

(10 x 3 = 30 marks)

#### Section B

Answer all questions. Each question carries ten marks.

- a) Give a detailed account of Operating system services.

OR

- b) Discuss the structure of a typical operating system.

14. a) Explain any two preemptive and any one non-preemptive scheduling algorithm. Illustrate the algorithms taking suitable example.

OR

b) What are the methods for handling deadlock? How will you prevent deadlock?

15. a) Explain the need for paging and segmentation. Discuss the different page replacement algorithms.

OR

b) Discuss : i. Free space management      ii. NFS

16. a) Discuss Kernel I/O subsystems.

OR

b) Give a detailed account of Disk scheduling and Disk structure.

17. a) Explain the design issues of distributed systems.

OR

b) Give a comprehensive account of Protection.

**(5 x 10 = 50 marks)**

| INSTRUCTIONS TO QUESTION PAPER SETTER                     |                   |                                |                   |                                                                 |                                       |                                                          |                   |
|-----------------------------------------------------------|-------------------|--------------------------------|-------------------|-----------------------------------------------------------------|---------------------------------------|----------------------------------------------------------|-------------------|
| Semester : 1 Course : MCS1C05 INTRODUCTION TO PROGRAMMING |                   |                                |                   |                                                                 |                                       |                                                          |                   |
| Section A                                                 |                   |                                |                   | Section B                                                       |                                       |                                                          |                   |
| Total no of questions                                     | Mark per question | No of questions to be answered | Time per question | Total no of questions                                           | Mark per question                     | No of questions to be answered                           | Time per question |
| 12                                                        | 3                 | 10<br>10 x 3 = 30              | 5 to 8 minutes    | 5 either-or questions - each containing two parts - (a) and (b) | 10 marks per each part<br>5 x 10 = 50 | All five questions selecting one part from each question | 20 to 25 minutes  |
| UNIT WISE DISTRIBUTION                                    |                   |                                |                   |                                                                 |                                       |                                                          |                   |
| UNIT                                                      |                   | SECTION A                      |                   | SECTION B                                                       |                                       |                                                          |                   |
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### Model Question

#### FIRST SEMESTER M Sc Computer Science DEGREE EXAMINATION

#### MCS1C05 INTRODUCTION TO PROGRAMMING

Time: 3 Hrs

Max Marks: 80

#### Section A

Answer any ten questions. Each question carries three marks.

1. Give the syntax of for loop and while Loop.
2. List and explain any three string functions.
3. Discuss hierarchy of operations in c expressions.
4. Write a function to find the length of a string.
5. Differentiate structure and Union.
6. What do you mean by preprocessor directives? Give examples.
7. What is a constructor? What are the different types of constructors in C++?
8. What do you mean by dynamic allocation of memory?
9. Give an example of operator overloading.
10. What is a virtual function?
11. What is a stream?
12. Explain the term "Name spaces".

(10 x 3 = 30 marks)

#### Section B

Answer all questions. Each question carries ten marks.

13. a) Write a complete c program to multiply two matrices.

OR

- b) i. Write a c program to search a name in an array of n names.

ii. With suitable examples, explain the different decision making and branching constructs in c. 6+4

14. a) What is a pointer? What are the operations performed on pointers? Explain with example how pointers can be used to access array elements.

OR

b) i. Declare a structure for storing student information (make your own assumptions). Write a function to read details of a student into a structure variable.

ii. Explain the different parameter passing mechanisms with suitable examples.

15. a) Explain friend functions and friend class with suitable examples.

OR

b) Declare a class for storing the details of books. Include suitable constructor and methods for reading and printing the details.

16. a) With suitable example explain function overloading.

OR

b) With suitable examples explain different types of inheritance supported in C++.

17. a) Give detailed account of file processing in C++.

OR

b) Give a detailed account of STL.

**(5 x 10 = 50 marks)**

| INSTRUCTIONS TO QUESTION PAPER SETTER |                   |                                |                   |                                                                 |                                       |                                                          |                   |
|---------------------------------------|-------------------|--------------------------------|-------------------|-----------------------------------------------------------------|---------------------------------------|----------------------------------------------------------|-------------------|
| Semester : 2                          |                   |                                |                   | Course : MCS2C06 JAVA PROGRAMMING                               |                                       |                                                          |                   |
| Section A                             |                   |                                |                   | Section B                                                       |                                       |                                                          |                   |
| Total no of questions                 | Mark per question | No of questions to be answered | Time per question | Total no of questions                                           | Mark per question                     | No of questions to be answered                           | Time per question |
| 12                                    | 3                 | 10<br>10 x 3 = 30              | 5 to 8 minutes    | 5 either-or questions - each containing two parts - (a) and (b) | 10 marks per each part<br>5 x 10 = 50 | All five questions selecting one part from each question | 20 to 25 minutes  |
| UNIT WISE DISTRIBUTION                |                   |                                |                   |                                                                 |                                       |                                                          |                   |
| UNIT                                  |                   | SECTION A                      |                   | SECTION B                                                       |                                       |                                                          |                   |
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### Model Question

## SECOND SEMESTER M Sc Computer Science DEGREE EXAMINATION

### MCS2C06 JAVA PROGRAMMING

Time: 3 Hrs

Max Marks: 80

#### Section A

Answer any ten questions. Each question carries three marks.

1. Explain JVM.
2. Explain type casting in Java.
3. With suitable example explain constructors.
4. What do you mean by method overloading?
5. What is the significance of Garbage collection?
6. What is a package?
7. What do you mean by runnable interface?
8. What is a deadlock in thread management?
9. What is an applet?
10. What is AWT?
11. What is an event?
12. What is a stored procedure?

(10 x 3 = 30 marks)

**Section B**

**Answer all questions. Each question carries ten marks.**

13. (a) Give a detailed account of control statements in Java.

*Or*

(b)i. List and explain important features of Java.

ii. Write a Java program to search a name in an array of names. (5+5)

14. (a) i. Differentiate between Class and Interface.

ii. Describe the following methods: replace, compareTo and charAt. (5+5)

*Or*

(b) With suitable examples explain Inheritance.

15. (a) Give a detailed account of exception handling in Java.

*Or*

(b) i. Explain how to create a package with suitable example.

ii. Write a program to create two threads, one thread will print odd numbers and second thread will print even numbers between 1 to 20 numbers. (5+5)

16. (a) Explain Applet life cycle.

*Or*

(b) Discuss AWT controls.

17. (a) Give a detailed account of event handling.

*Or*

(b) Discuss JDBC architecture.

**(5 x 10 = 50 marks)**



| INSTRUCTIONS TO QUESTION PAPER SETTER                      |                   |                                |                   |                                                                 |                                              |                                                          |                   |
|------------------------------------------------------------|-------------------|--------------------------------|-------------------|-----------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|-------------------|
| Semester : 2 Course : MCS2C07 Data Structures & algorithms |                   |                                |                   |                                                                 |                                              |                                                          |                   |
| Section A                                                  |                   |                                |                   | Section B                                                       |                                              |                                                          |                   |
| Total no of questions                                      | Mark per question | No of questions to be answered | Time per question | Total no of questions                                           | Mark per question                            | No of questions to be answered                           | Time per question |
| 12                                                         | 3                 | 10<br>$10 \times 3 = 30$       | 5 to 8 minutes    | 5 either-or questions - each containing two parts - (a) and (b) | 10 marks per each part<br>$5 \times 10 = 50$ | All five questions selecting one part from each question | 20 to 25 minutes  |
| UNIT WISE DISTRIBUTION                                     |                   |                                |                   |                                                                 |                                              |                                                          |                   |
| UNIT                                                       |                   | SECTION A                      |                   | SECTION B                                                       |                                              |                                                          |                   |
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### Model Question

## SECOND SEMESTER M Sc Computer Science DEGREE EXAMINATION

### MCS2C07 DATA STRUCTURES & ALGORITHMS

Time: 3 Hrs

Max Marks: 80

#### Section A

Answer any ten questions. Each question carries three marks.

- Write a function to concatenate two singly Linked List.
- Explain singly Linked List representation of polynomials.
- With suitable example, explain the significance of Big Oh in algorithm analysis.
- Give a class declaration for array based stack.
- Define Tree and Binary Tree.
- What is a priority Queue? Give any one application of it.
- Differentiate red-Black tree and AVL tree.
- Write a recursive function for the inorder traversal of a binary tree.
- Differentiate Depth first and Depth first approaches in graph traversal.
- Discuss any two graph representation schemes.
- Explain divide-and-Conquer strategy.
- Give the basic principle of Quick sort.

(10 x 3 = 30 marks)

#### Section B

Answer all questions. Each question carries ten marks.

- a) Explain a scheme of representing Sparse Matrices. Write and explain a function to add two sparse matrices represented with your scheme. State your assumptions.

OR

- b) i. Write a recursive function to reverse a Singly Linked List.  
ii. Write a function to delete the  $i^{\text{th}}$  node (if exist) froma singly Linked List.  
iii. Write a function to delete first node from a Doubly Linked List. (3+4+3)

14. a) Explain Infix, Postfix and Prefix notations with examples. Write a complete program to convert an infix expression to postfix. Include class declarations and functions for stack operations.

OR

- b) Write a Non-recursive function to traverse a Binary tree inorder. Include class declarations, functions for stack/Queue if employed. Comment on it time complexity.
15. a) What is a threaded Binary tree? Give its advantage. Write a function for inorder traversal of an Inorder Threaded Binary tree. Include appropriate class declarations.

OR

- b) Explain Hashing. Discuss any three Collision Resolution techniques. Highlight advantages/limitations of each technique.
16. a) Explain shortest path problem. Write and illustrate with suitable example Dijkstra's algorithm.

OR

- b) Define graph? List and explain any two applications of graph. Write a and explain Prim's algorithm. Illustrate with suitable example.
17. a) Write and explain necessary functions for Heap sort.

OR

- b) Explain the principle of dynamic program. Write and explain Warshal's algorithm.

**(5 x 10 = 50 marks)**

| INSTRUCTIONS TO QUESTION PAPER SETTER |                   |                                |                   |                                                                 |                                              |                                                          |                   |
|---------------------------------------|-------------------|--------------------------------|-------------------|-----------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|-------------------|
| Semester : 2                          |                   |                                |                   | Course : MCS2C08 DATABASE MANAGEMENT SYSTEMS                    |                                              |                                                          |                   |
| Section A                             |                   |                                |                   | Section B                                                       |                                              |                                                          |                   |
| Total no of questions                 | Mark per question | No of questions to be answered | Time per question | Total no of questions                                           | Mark per question                            | No of questions to be answered                           | Time per question |
| 12                                    | 3                 | 10<br>$10 \times 3 = 30$       | 5 to 8 minutes    | 5 either-or questions - each containing two parts - (a) and (b) | 10 marks per each part<br>$5 \times 10 = 50$ | All five questions selecting one part from each question | 20 to 25 minutes  |
| UNIT WISE DISTRIBUTION                |                   |                                |                   |                                                                 |                                              |                                                          |                   |
| UNIT                                  |                   | SECTION A                      |                   | SECTION B                                                       |                                              |                                                          |                   |
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| 4                                     |                   | 2                              |                   | 1                                                               |                                              |                                                          |                   |
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### Model Question

## SECOND SEMESTER M Sc Computer Science DEGREE EXAMINATION

### MCS2C08 DATABASE MANAGEMENT SYSTEMS

Time: 3 Hrs

Max Marks: 80

#### Section A

Answer any ten questions. Each question carries three marks.

- Given the following relations :

EMP (Name, Eno, Deptno, Salary)

DEPT (Deptno, Dname, Location)

Write a query in SQL to find the name of the employee of each department who is getting highest salary.

- Explain join operation in relational algebra.
- Explain the difference between procedural and non-procedural DML
- Differentiate between primary key, candidate key and super Key in ER model.
- What is UML?
- Explain the terms Assertion and Triggers.
- Differentiate between Indexing and Hashing.
- What do you mean by a transaction?
- What do you mean by Distributed databases?
- List any three differences between RDBMS and OODBMS.
- List the data types in PostgreSQL.
- What do you meant by aggregate function in pgSql

(10 x 3 = 30 marks)

**Section B**

**Answer all questions. Each question carries ten marks.**

13. a) i. Discuss the salient features of Relational Model.  
 ii. Consider the following relation schemes:  
 Project (Project#, Project\_name, chief\_architect)  
 Employee (Emp#, Empname)  
 Assigned\_To (Project#, Emp#)  
 Give expression in Tuple Relational calculus and Domain Relational calculus for each of the queries below:  
 (i) Get the employee numbers of employees who work on all projects.  
 (ii) Get the employee numbers of employees who do not work on the COMP123 project. (5+5)  
 OR  
 b) Explain the basic structure of SQL. With suitable example explain Set operations in SQL.
14. a) Give a detailed account of different Normal forms.  
 OR  
 b) Construct an ER diagram with all major components for a banking enterprise with entity sets customer, branch, loan, payment, account etc along with your own assumptions.
15. a) Explain the essential properties of transactions. Explain Concurrency control with examples.  
 OR  
 b) What is the significance of Hashing in DBMs? Give different Hashing schemes employed in DBMS.
16. a) Give a detailed account of Data warehousing.  
 OR  
 b) Discuss basic concepts, organization, advantages and major issues related to parallel databases
17. a) Give a detailed account of PostgreSQL administration.  
 OR  
 b) with suitable example explain postgresQL programming.

**(5 x 10 = 50 marks)**

| INSTRUCTIONS TO QUESTION PAPER SETTER |                   |                                |                   |                                                                 |                                              |                                                          |                   |
|---------------------------------------|-------------------|--------------------------------|-------------------|-----------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|-------------------|
| Semester : 2                          |                   |                                |                   | Course : MCS2C09 COMPUTER NETWORKS                              |                                              |                                                          |                   |
| Section A                             |                   |                                |                   | Section B                                                       |                                              |                                                          |                   |
| Total no of questions                 | Mark per question | No of questions to be answered | Time per question | Total no of questions                                           | Mark per question                            | No of questions to be answered                           | Time per question |
| 12                                    | 3                 | 10<br>$10 \times 3 = 30$       | 5 to 8 minutes    | 5 either-or questions - each containing two parts - (a) and (b) | 10 marks per each part<br>$5 \times 10 = 50$ | All five questions selecting one part from each question | 20 to 25 minutes  |
| UNIT WISE DISTRIBUTION                |                   |                                |                   |                                                                 |                                              |                                                          |                   |
| UNIT                                  |                   | SECTION A                      |                   | SECTION B                                                       |                                              |                                                          |                   |
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### Model Question

## SECOND SEMESTER M Sc Computer Science DEGREE EXAMINATION

### MCS2C09 COMPUTER NETWORKS

Time: 3 Hrs

Max Marks: 80

#### Section A

Answer any ten questions. Each question carries three marks.

- List four main applications of Internet.
- What are the features of an optical fiber?
- List the services provided by Data Link Layer.
- Write a note on simplex stop-and-wait protocol.
- What is fast Ethernet?
- Compare and contrast Pure ALOHA and Slotted ALOHA.
- Write short notes on hierarchical routing.
- Explain Flooding.
- What is Cryptography?
- Write short notes on Simple Transport Protocol.
- Write the functions of LLC.
- What is the difference between connection oriented communication and connectionless communication.

(10 x 3 = 30 marks)

**Section B**

**Answer all questions. Each question carries ten marks.**

13. (a) Discuss OSI reference model as network architecture.

*Or*

(b) Discuss LAN, WAN, MAN with respect to speed, coverage (area) and topology.

14. (a) Explain the sliding window protocol in detail.

*Or*

(b) Compare and contrast error detection with error correction.

15. (a) Discuss the frame format for 802.3 LAN.

*Or*

(b) Discuss CSMA/CD protocol used in LAN .

16. (a) What is an IP address? Explain the different classifications of IP address.

*Or*

(b) Discuss any four methods of congestion control in datagram subnets.

17. (a) Explain about the TCP header and working of the TCP protocol.

*Or*

(b) What is UDP? Explain the structure of UDP header?

**(5 x 10 = 50 marks)**

| INSTRUCTIONS TO QUESTION PAPER SETTER |                   |                                |                   |                                                                 |                                              |                                                          |                   |
|---------------------------------------|-------------------|--------------------------------|-------------------|-----------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|-------------------|
| Semester : 2                          |                   |                                |                   | Course : MCS2C10 FORMAL LANGUAGES AND FINITE AUTOMATA           |                                              |                                                          |                   |
| Section A                             |                   |                                |                   | Section B                                                       |                                              |                                                          |                   |
| Total no of questions                 | Mark per question | No of questions to be answered | Time per question | Total no of questions                                           | Mark per question                            | No of questions to be answered                           | Time per question |
| 12                                    | 3                 | 10<br>$10 \times 3 = 30$       | 5 to 8 minutes    | 5 either-or questions - each containing two parts - (a) and (b) | 10 marks per each part<br>$5 \times 10 = 50$ | All five questions selecting one part from each question | 20 to 25 minutes  |
| UNIT WISE DISTRIBUTION                |                   |                                |                   |                                                                 |                                              |                                                          |                   |
| UNIT                                  |                   | SECTION A                      |                   | SECTION B                                                       |                                              |                                                          |                   |
| 1                                     |                   | 3                              |                   | 1                                                               |                                              |                                                          |                   |
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| 4                                     |                   | 2                              |                   | 1                                                               |                                              |                                                          |                   |
| 5                                     |                   | 1                              |                   | 1                                                               |                                              |                                                          |                   |

### Model Question

#### SECOND SEMESTER M Sc Computer Science DEGREE EXAMINATION

#### MCS2C10 FORMAL LANGUAGES AND FINITE AUTOMATA

Time: 3 Hrs

Max Marks: 80

#### Section A

Answer any ten questions. Each question carries three marks.

1. Define NFA and DFA.
2. Differentiate between transducers and acceptors.
3. Define Language and Grammar.
4. Define Regular grammar. Give example.
5. Write Regular expression for the language on  $\{0,1\}$  'all strings ending in 01'.
6. Explain Parsing with suitable example.
7. Define CNF and GNF.
8. Differentiate between PDA and DFA.
9. Define Deterministic PDA.
10. What do you mean by a context free Language? Give example.
11. Define standard Turing machine.
12. What is a Linear Bounded Automata?

(10 x 3 = 30 marks)

**Section B****Answer all questions. Each question carries ten marks.**

13. (a) i. Prove that. If a regular language  $L$  is accepted by an NFA then there exists a DFA to accept  $L$ .

ii. Find a DFA for the language on  $\Sigma = \{a, b\}$   $L = \{w : |w| \bmod 2 = 0\}$  (7+3)

*Or*

(b)i. With suitable example illustrate how number of states in a Finite Automaton can be reduced.

ii. Find a grammar for  $\Sigma = \{a, b\}$  that generate the sets of all string's with no more than two a's. (7+3)

14. (a) i. Prove that  $L = \{0^i 1^j / i > j\}$  is not regular using pumping lemma.

ii. Define derivation tree. With an example explain leftmost and rightmost derivation. (6+4)

*Or*

(b) i. Define regular language and regular grammar.

ii. Define context free grammar. With suitable example explain ambiguity in grammar. (4+6)

15. (a) i. Remove useless and unit productions from the grammar  $S \rightarrow Aa / B, B \rightarrow A/bb,$

$A \rightarrow a/bc/B$ .ii. Convert the grammar with productions  $S \rightarrow ABa, A \rightarrow aab, B \rightarrow Ac.$  to Chomsky Normal Form.

(5+5)

*Or*

(b) i. Construct an NPDA for the language.  $L = \{w \in \{a,b\}^* : n_a(w) = n_b(w)\}.$

ii. Prove that for any context free language  $L$ , there exists an NPDA  $M$  such that  $L = L(M).$  (5+5)

16. (a) State and prove pumping lemma for Context free Languages.

*Or*

(b) With suitable example explain how Turing machine can be implemented as a Transducer.

17. (a) Explain i. Nondeterministic Turing Machine ii. Universal Turing Machine.

*Or*

(b) Discuss limits of algorithmic computation.

**(5 x 10 = 50 marks)**



  
**KANNUR UNIVERSITY**

(Abstract)

B.Com Programme -Scheme, Syllabus and Model Question Papers - Core/Complementary/Open Courses under Choice Based Credit Semester System-Implemented with effect from 2014 Admission - Orders issued.

ACADEMIC BRANCH

U.O No. Acad/C1/3544/2014

Dated, Civil Station (PO), 3-05-2014

- Read: 1. U.O.No.Acad/C2/2232/2014 dated 14/03/2014  
2. Minutes of the meeting of the Board of Studies in Commerce UG held on 23-01-2014  
3. Minutes of the meeting of the Faculties of Commerce and Management Studies held on 28-03-2014  
4. Letter dated 28-03-2014 from the Chairman, Board of Studies Commerce UG

ORDER

1. The Revised Regulation for Choice based Credit Semester System have been implemented in this University with effect from 2014 admission vide paper read (1) above.

2. As per the paper read (2) above, Board of Studies in Commerce UG finalized the Scheme, Syllabus and Model Question Papers for B.Com Programmes under Choice Based Credit Semester System with effect from 2014 admission.

3. As per the paper read (3) above the meeting of Faculty of Commerce and Management Studies approved the Scheme, Syllabus and Model question papers for B.Com Programme with effect from 2014 admission.

4. The Chairman, Board of Studies in Commerce UG, vide paper (4) read above, has forwarded the Scheme, Syllabus & Model Question Papers for B.Com Programme for implementation with effect from 2014 admission.

5. The Vice Chancellor after considering the matter in detail and in exercise of the powers of Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement Scheme, Syllabus and Model Question Papers (Core/Complementary/Open Courses) for B.Com Programme under Choice Based Credit Semester System with effect from 2014 admission subject to report Academic Council.

6. Orders are, therefore, issued accordingly.

7. The Implemented Scheme, Syllabus and Model Question Papers are appended.

Sd/-  
DEPUTY REGISTRAR (Academic)  
For REGISTRAR

To,  
The Principals of Colleges offering B.Com Programme

(PTO)

5/5/14

1. The Examination Branch (through PA to CE)
2. PS to VC/PA to /PA to Registrar /
3. Chairman BOS Commerce UG
4. PA to CE
5. DR/AR I Academic
6. SF/DF/FC.



Forwarded/ by Order

A handwritten signature in black ink, appearing to be 'S. S. S.', written over a horizontal line.

Section Officer

**For more details; log on [www.kannur university.ac.in](http://www.kannur university.ac.in)**

| SCHEME OF CORE COURSES                                                                    |   |     |                                                        |                |                  |         |          |    |              |
|-------------------------------------------------------------------------------------------|---|-----|--------------------------------------------------------|----------------|------------------|---------|----------|----|--------------|
| Total Marks 1500 - Total Credits 120 - Working Days/Semester 90 - WorkingHrs/Semester 450 |   |     |                                                        |                |                  |         |          |    |              |
| Sl. No                                                                                    |   | Sem | Course Title                                           | Type of Course | Mark             | Credit  | Hrs/Week |    | Hrs/Semester |
| 1                                                                                         | 1 | I   | <b>1B01 COM</b><br>Management Concepts & Principles    | Core 1         | 50 (40+10)       | 2       | 3        | 11 | 54           |
| 2                                                                                         | 2 |     | <b>1B02 COM</b><br>Financial Accounting                | Core 2         | 50 (40+10)       | 3       | 4        |    | 72           |
| 3                                                                                         | 3 |     | <b>1C01 COM</b><br>Bus. Statistics                     | Comp 1         | 50 (40+10)       | 3       | 4        |    | 72           |
| 4                                                                                         | 1 | II  | <b>2B03 COM</b><br>Principles of Marketing             | Core 3         | 50 (40+10)       | 2       | 3        | 11 | 54           |
| 5                                                                                         | 2 |     | <b>2B04 COM</b><br>Human Resource Management           | Core 4         | 50 (40+10)       | 2       | 3        |    | 54           |
| 6                                                                                         | 3 |     | <b>2C02COM</b><br>Quantitative Tech. for Bus. Decision | Comp2          | 50 (40+10)       | 4       | 5        |    | 90           |
| 7                                                                                         | 1 | III | <b>3A11 COM</b><br>Disaster Management                 | Comm11         | 50 (40+10)       | 4       | 4        | 25 | 72           |
| 8                                                                                         | 2 |     | <b>3A12 COM</b><br>Numerical Skills for Business       | Comm 12        | 50 (40+10)       | 4       | 4        |    | 72           |
| 9                                                                                         | 3 |     | <b>3C03 COM</b><br>Basics of Research Methodology      | Comp 3         | 50 (40+10)       | 3       | 3        |    | 54           |
| 10                                                                                        | 4 |     | <b>3B05 COM</b><br>Advanced Accounting                 | Core 5         | 50 (40+10)       | 4       | 5        |    | 90           |
| 11                                                                                        | 5 |     | <b>3B06 COM</b><br>Optional I                          | Core 6         | 50 (40+10)       | 3       | 5        |    | 90           |
| 12                                                                                        | 6 |     | <b>3C04 COM</b><br>Business Regulatory Framework       | Comp 4         | 50 (40+10)       | 3       | 4        |    | 72           |
| 13                                                                                        | 1 | IV  | <b>4A13 COM</b><br>Entrepreneurship                    | Comm13         | 50 (40+10)       | 4       | 4        | 25 | 72           |
| 14                                                                                        | 2 |     | <b>4A14 COM</b><br>Environment Studies                 | Comm14         | 50 (40+10)       | 4       | 4        |    | 72           |
| 15                                                                                        | 3 |     | <b>4B07 COM</b><br>Income Tax Law & Practice I         | Core 7         | 50 (40+10)       | 4       | 5        |    | 90           |
| 16                                                                                        | 4 |     | <b>4B08 COM</b><br>Informatics Skills (T+P)            | Core 8         | 50 (20 + 20 +10) | 3 (2+1) | 4 (2+2)  |    | 72 (36+36)   |
| 17                                                                                        | 5 |     | <b>4B09 COM/Optional II</b>                            | Core 9         | 50 (40+10)       | 3       | 4        |    | 72           |

|                       |                       |                                                    |                                                           |                                          |                    |             |   |           |    |
|-----------------------|-----------------------|----------------------------------------------------|-----------------------------------------------------------|------------------------------------------|--------------------|-------------|---|-----------|----|
| 18                    | 6                     |                                                    | <b>4C05 COM</b><br>Corporate Law &<br>Business Regulation | Comp 5                                   | 50 (40+10)         | 3           | 4 |           | 72 |
| 19                    | 1                     | <b>V</b>                                           | <b>5B10 COM</b><br>Cost Accounting                        | Core 10                                  | 50 (40+10)         | 4           | 5 | <b>25</b> | 90 |
| 20                    | 2                     |                                                    | <b>5B11 COM</b><br>Corporate Accounting                   | Core 11                                  | 50 (40+10)         | 4           | 5 |           | 90 |
| 21                    | 3                     |                                                    | <b>5B12 COM</b><br>Auditing                               | Core 12                                  | 50 (40+10)         | 3           | 4 |           | 72 |
| 22                    | 4                     |                                                    | <b>5B13 COM</b><br>Income Tax Law &<br>Practice II        | Core 13                                  | 50 (40+10)         | 4           | 5 |           | 90 |
| 23                    | 5                     |                                                    | <b>5B14 COM</b><br>Optional III                           | Core 14                                  | 50 (40+10)         | 3           | 4 |           | 72 |
| 24                    | 6                     |                                                    | <b>5D01 COM</b><br>Open Course                            | Open                                     | 50 (40+10)         | 2           | 2 |           | 36 |
| 25                    | 1                     |                                                    | <b>VI</b>                                                 | <b>6B15 COM</b><br>Management Accounting | Core 15            | 50 (40+10)  | 4 |           | 5  |
| 26                    | 2                     | <b>6B16 COM</b><br>International Business          |                                                           | Core 16                                  | 50 (40+10)         | 4           | 5 | 90        |    |
| 27                    | 3                     | <b>6B17 COM</b><br>Modern Banking                  |                                                           | Core 17                                  | 50 (40+10)         | 4           | 5 | 90        |    |
| 28                    | 4                     | <b>6B18 COM</b><br>Financial<br>Markets & Services |                                                           | Core 18                                  | 50 (40+10)         | 3           | 3 | 54        |    |
| 29                    | 5                     | <b>6B19 COM</b><br>Optional IV                     |                                                           | Core 19                                  | 50 (40+10)         | 3           | 5 | 90        |    |
| 30                    | 6                     | <b>6B20 COM</b><br>Project                         |                                                           | Project                                  | 50 (40+10)         | 2           | 2 | 36        |    |
| <b>* Total</b>        |                       |                                                    |                                                           |                                          | 1500<br>(1200+300) | <b>* 98</b> |   |           |    |
| <b>No. of Courses</b> | <b>Type of Course</b> |                                                    |                                                           | <b>Credit</b>                            | <b>Mark</b>        |             |   |           |    |
| <b>4</b>              | Common                |                                                    |                                                           | 16                                       | 4x50= 200          |             |   |           |    |
| <b>5</b>              | Complementary         |                                                    |                                                           | 16                                       | 5x50= 250          |             |   |           |    |
| <b>19+1 Project</b>   | Core (62+2)           |                                                    |                                                           | 64                                       | 20x50= 1000        |             |   |           |    |
| <b>1</b>              | Open                  |                                                    |                                                           | 2                                        | 1 X 50 =50         |             |   |           |    |
|                       | <b>* Total</b>        |                                                    |                                                           | <b>* 98</b>                              | <b>1500</b>        |             |   |           |    |
| <b>4</b>              | English               |                                                    |                                                           | 14                                       | 200                |             |   |           |    |
| <b>2</b>              | Additional Language   |                                                    |                                                           | 8                                        | 100                |             |   |           |    |
| <b>36</b>             | <b>Total</b>          |                                                    |                                                           | <b>120</b>                               | <b>1800</b>        |             |   |           |    |

# SYLLABUS 2014

## 1B01 COM (CORE –I): MANAGEMENT CONCEPTS & PRINCIPLES

**No.of Credits -2**

**No.of Contact hours -3Hrs per week / 54 Hrs**

### **Objectives:**

*To acquaint the students with the principles of management, help in understanding various functions of management and developing management skills.*

### **Module I:**

**Management Concepts:** Evolution of Management thoughts : Classical approaches -Scientific management, administrative management and bureaucracy- Neo classical Approaches – Human relations and Behavioral approach - Modern approaches-Quantitative approach , systems approach, and contingency approach . [10Hours]

### **Module II:**

**Planning - :** Nature, importance and purpose of planning - Planning process- Steps in Planning-- Types of plans – Strategies-Standing Plans: Policies, Procedures, Methods and Rules- Limitations of planning- [10 Hours]

### **Module III:**

**Organising:** Nature and purpose of organization-Principles of organizing- Types of organization – line, functional, line and staff - Departmentalization- Span of management — Centralization Vs decentralization of authority and responsibility - Span of Control - MBO and MBE. [9Hours]

### **Module IV:**

**Staffing:** Concepts – factors affecting staffing- manpower planning – process – importance. Performance appraisal : meaning – objectives [6Hours]

### **Module V:**

**Directing:** Meaning-definition- principles –techniques of direction. Motivation: techniques – problems-- motivation and performance – Theories : Maslow’s Need Hierarchy – Herzberg –Theory X and Theory Y – Leadership: concept – styles – leadership and management. [13 Hours]

### **Module VI :**

**Controlling:** Meaning – definition –essentials of effective control system – behavioral implications – causes of resistance to control. [6 Hours]

### **Reference :**

1. Principles of Management : PC Tripathi& PN Reddy
2. Principles of Management :B.S.Mushal
3. Management theory &Practice :C.B.Guptha
4. Essential of Management : Harold koontz Heinz &Wehrich.
5. Principles and Practice of management :T.N.Chabra

## **1B02COM(CORE –II): FINANCIAL ACCOUNTING**

**No of credits: 3**

**Contact hours: 72 Hours per week 4**

**Objectives of the Course:**

To develop among the students a conceptual understanding of the fundamentals of financial accounting system and to equip them with basic skills for recording various types of business transactions. To help the students to acquire the conceptual knowledge of accounting and to help them to learn the techniques of preparing the financial statements.

**Module I:**

Introduction to accounting- Branches of accounting -Meaning, characteristics, objects, scope and limitations of financial accounting- Evolution of Accounting as a social science –Accounting principles -GAAP –Accounting systems - Accounting Standards – Need and Advantages - Role of Accountant in the society –Modern trends in Accounting (Computerized accounting, Environmental accounting, forensic accounting, creative accounting ) – Accounting process up to preparation of Trial Balance (An over view)

(10 hours)

**Module II:**

Final Accounts of Non- corporate Entities: Capital and Revenue –deferred revenue expenditure - Manufacturing Trading and Profit & Loss Accounts and Balance Sheets – Adjusting and Closing entries – Rectification of errors.

(18 hours)

**Module III:**

Accounting for special transactions: Consignment Accounts – concepts – accounting treatment – cost price and invoice price – unsold stock – loss of goods. Joint Venture accounts- (Memorandum Joint Venture Account excluded) - difference from consignment and partnership- accounting treatment – Account current and average due date including red ink interest

(30 hours)

**Module IV**

Accounting for non trading concerns –Receipts and Payment account- Income and expenditure account – accounting treatment – preparation of Balance Sheet

(14 hours)

**References :**

1. Advanced Accounting : Prof. M. C.K.Nambiar
2. Advanced Accounting :M.C.Shukla&T.S.Grewal
3. Advanced Accounting :R.L.Guptha
4. Advanced Accounting :S.N.Maheshwari
5. Advanced Accounting :B.S.Raman
6. Advanced Accounting : Ashok Sehgal& Deepak Sehgal
7. Advanced Accounting :S.K.R.Paul

## 1C01 COM(COMPL - 1): BUSINESS STATISTICS

**No.of Credits -3**

**No.of Contact hours -72 Hours per week 4**

### **Objectives**

*To familiarize the students with the basic statistical tools used to summaries and analyse quantitative information for decision making.*

### **Module I**

**Introduction to statistics**- Meaning, Definition, functions, scope and limitation- Statistical investigation – stages (Brief explanation only) - Classification and Tabulation-Construction of frequency distributions.

[16 Hours]

### **Module II**

**Measures of central tendency** – meaning –requisites of good average -objectives - types of averages- Mean: simple & weighted – Median – Mode - Geometric mean – Harmonic mean (Algebraic method only).

[18 Hours]

### **Module III**

**Measures of dispersion** – meaning –various measures of dispersion –Range-Quartile Deviation – Mean Deviation -Standard deviation.

[18 Hours]

### **Module IV**

**Index Numbers** – meaning and definition-uses- Problems in the construction of index numbers-Types of index numbers – Methods of construction of index numbers - Tests of adequacy - Fixed Base and Chain Base Methods –cost of living index- Consumer price index: uses and methods of construction

[20 Hours]

### **Reference**

1. S.P. Gupta : Statistical Methods, Sultan Chand & Sons, NewDelhi2.
2. Dr. B.N.Gupta : Statistics Theory & Practice , SahithyaBhavan,Agra
3. D.N. Elhance : Fundamentals of Statistics, KithabMahal
4. C.B Gupta & Vijay Gupta : An Introduction to Statistical Methods, AneBooks Pvt. Ltd.
5. SL Aggarwal& SL Bhardwaj : Fundamentals of Business Statistics, KalyaniPublishers.



## 2B03 COM(CORE –III) :PRINCIPLES OF MARKETING

**No.of Credits -2**

**No.of Contact hours -3 Hrs per week / 54 Hrs**

**Objectives :**

*To provide basic knowledge about the concepts, principles, tools and techniques of marketing*

### **Module I**

**Introduction**-Marketing – Meaning- Nature scope and importance of marketing-modern concepts of marketing – marketing functions. [8 Hours]

### **Module II.**

**Marketing mix:** Marketing mix – meaning- importance- product life cycle (PLC) – Product time/ mix- Building brand equity- packing- labeling- product positioning. [12 Hours]

### **Module III**

**Pricing-** Meaning and definition- steps in pricing – pricing strategies – types [8 Hours]

### **Module IV.**

**Channels of distribution-** Meaning and definition – Physical distribution – middlemen - types- functions of middlemen- factors to be considered in selecting channels – modern channels of marketing – tele-marketing - internet marketing- net work marketing - customer relationship marketing. [16 Hours]

### **Module V.**

**Services Marketing:** Introduction – nature-types- bank marketing - insurance- tourism consultancy – hospitals (An Overview). [10 Hours]

### **References:**

1. Principles of Marketing - Philip Kotler
2. Fundamentals of marketing - William Stanton
3. Marketing Management - VS Ramaswamy& S Namakumari
4. Marketing Management - RajanSaxena
5. Marketing Management - Sherlakar .S.A
6. Marketing Management - Raman B.S
7. Services Marketing - S.M. Jha
8. An . Essence of Services Marketing - Pay naAdrim
9. Services Marketing - Christopher .H Lovelock

## **2B04 COM(CORE –IV): HUMAN RESOURCE MANAGEMENT**

**No.of Credits: 2**

**No.of Contact hours -3 Hrs per week / 54 Hrs**

### **Objective:**

*The objective of this course is to familiarize the students with the basic principles of Human Resource Management (HRM).*

### **Module I**

**Introduction to Human Resource Management (HRM)** – Meaning - functions – Difference between personal management and HRM – nature and scope of HRM – Role of HR manager – HR planning.  
[8 Hours]

### **Module II**

**Recruitment** – selection - induction – placement – job analysis – job specification – job description – job evaluation – Wages and salary administration, -wage payment systems- Time & piece rate - incentives – kinds of incentive plans- Halsey plan, Rowan plan (Theory Only) [13 Hours]

### **Module III**

**Performance Management** – meaning and objectives of performance appraisal –Performance appraisal methods [10 Hours]

### **Module IV**

**HR development** – meaning and scope of HRD – Training - meaning and scope – types and methods of training – importance of training in HRD. [13Hours]

### **Module V**

**Human Resource problems** – Employee discipline- Absenteeism – Turnover stocks – Lockouts - Lay off - Retrenchment – Trade Unions – meaning – functions -problems of trade Union – Grievance Redressal - meaning [10 Hours]

### **Reference:**

1. Human Resource Management : Dr. K. Aswathappa
2. Human Resource Management :L.M.Prasad
3. Human Resource Management :Subba Rao
4. Personnel Management : Edwin B. Flippo
5. Human Resource Management : T.N. Chhabra
6. Personnel Management : C B Mamoria.

## **2C02COM(COMPL- I1):QUANTITATIVE TECHNIQUES FOR BUSINESS DECISION**

**No.of Credits - 4**

**No.of Contact hours -90 Hours per week 5**

### **Objectives**

*To acquaint students with the basic statistical tools which have application in business and economic situations.*

### **Module I**

**Correlation** – Meaning – Classification - methods – scatter diagrams - Karl Pearson’s coefficient of correlation - Rank correlation

[15 Hours]

### **Module II**

**Regression Analysis:** Meaning and definition – types of regressions - regression lines - regression equations (simple regression only)

[18 Hours]

### **Module III**

**Time Series Analysis** - Meaning - components of time series - methods of measuring trend - moving average methods, method of least squares

[17 Hours]

### **Module IV**

**Probability** - Meaning and definition – important terms- –Theorems of probability - Addition and Multiplication theorem –Conditional probability – Bayes Theorem - permutation and combination - Probability Distributions – Binomial, Poisson and Normal (Simple problems only).

[40Hours]

### **Reference**

1. C.R.Kothari : Quantitative Techniques
2. S.P.Guptha : Statistical Methods, Sultan Chand & Sons, New Delhi
3. C. B Gupta & Vijay Gupta : An Introduction to Statistical Methods, AneBooks Pvt. Ltd.
4. P N Arora & Mrs. S Arora : Quantitative Aptitude Vol. I & II, S. Chand & Co. Ltd, New Delhi
5. S L Aggarwal & SL Bhardwaj : Fundamentals of Business Statistics, Kalyani Publishers
6. P, K Gupta & D.S Hira : Operations Research, S.Chand & Co. Ltd, New Delhi.
7. L.R Potti : Operations Research, Yamuna Publications, TVM

## **3A11 COM (COMMON XI): DISASTER MANAGEMENT**

**No. of Credits: 4**

**No. of Contact hours: 4 Hrs per week / 72 Hrs**

### **Course Objective:**

The main objective of the course is to study the emerging approaches in disaster reduction & management.

### **Module-I**

**Environmental Hazards, Environmental Disasters and Environmental Stress-** Meaning- Different types and classes of environmental hazards and disasters (10 Hours)

### **Module-II**

**Types of Environmental Hazards & Disasters** – Natural Hazards and Disasters- Planetary Hazards/ Disasters: (a) Endogenous Hazards: Volcanic Eruption–Earthquakes- Landslides. (b) Exogenous Hazards: Infrequent events - Cyclones – Lightning – Hailstorms Cumulative atmospheric hazards/ disasters: Floods – Droughts – Cold waves – Heat waves. Extra Planetary Hazards/ disasters. Man induced Hazards & Disasters: Physical hazards/ Disasters-Soil Erosion – Chemical hazards/ disasters: - Release of toxic chemicals, nuclear explosion-Biological hazards/ disasters - Population Explosion (22 Hours)

### **Module III**

**Phases of Disaster Management-** Three Stages: 1)Pre-disaster stage (Preparedness) – Preparing hazard zonation maps ,predictability/forecasting and warning- Preparing disaster preparedness plan - Land use zoning - Preparedness through (IEC) Information, education & Communication Pre-disaster stage (mitigation) - Disaster resistant house construction -Population reduction in vulnerable areas - Awareness. 2) Emergency stage-Rescue training for search & operation at national & regional level – Immediate relief – Assessment surveys.3) Post Disaster stage-Rehabilitation: Political, administrative aspect – social aspect – economic aspect – environmental aspect (20Hours)

### **Module-IV**

**Institutional Frame work-** Provision of immediate relief measures to disaster affected people – Prediction of hazards and disasters-measures of adjustment to natural hazards. Disaster Mitigation Institutions - Meteorological Observatory – Seismological Observatory- Volcano logy Institution-Hydrology Laboratory -.Industrial Safety Inspectorate – Institution of Urban & Regional Planners-Chambers of Architects- Engineering Council- National Standards Committee. Integrated Planning-Contingency management preparedness – Education on disasters – Community involvement – The adjustment of human population to natural hazards & disasters in the context of Kerala. Role of Media

(20 Hours)

**References:**

1. R.B Singh(Ed) :Disaster Management, Rawat Publications, New Delhi
2. H.K Gupta(Ed) :Disaster Management, Universiters Press, India:
3. R.B Singh : Space Technology for Disaster Mitigation in India (INCED), University of Tokyo4. Dr. Satender :Disaster Management in Hills, Concept Publishing Co., New Delhi
5. M.C Gupta : Manuals on Natural Disaster Management in India, National Centre for Disaster Management, IIPA, New Delhi.
6. R.K Bhandani : An Overview on Natural and Man made Disaster & their 44 Reduction, CSIR, New Delhi.
7. Kates B.I & White G.F: The Environment as Hazards, Oxfords, New York
8. SavinderSingh : Environmental Geography, PrayagPustakBhavan
9. . R.B Singh(Ed) :Environmental Geography, Heritage Publishers, New Delhi

## 3A12 COM (COMMON XII): NUMERICAL SKILLS FOR BUSINESS

**No.of Credits:4**

**No.of Contact hours: 72 Hours per week 4**

### **Objectives:**

To understand basic concepts in mathematics which are applied in the managerial decision making. To develop an understanding of numeric problems in business and social sciences, and techniques used to model such problems. To develop mathematical skills needed to analyze numeric data used in business and social sciences.

### **Module I**

Arithmetic -Average, mixtures - Ratios and proportions-Computation of interest- Simple interest, compound interest, effective yield -Future value, present value -Amortization, depreciation -Continuous compounding

[15 Hours]

### **Module II**

Set theory and simple application of Venn diagram-Truth table and its applications-Indices and surds-

[13 Hours]

### **Module III**

Linear simultaneous equations (upto 3 variables only)-Quadratic equations-Solution of linear inequalities (by geometric method only)

[20Hours]

### **Module IV**

Matrix Algebra :Introduction –Definition –Types of Matrix-Matrix operations-Addition and subtraction- Matrix multiplication- Transpose of a matrix-Determinants of a square matrix-determinants of order two and order three-Inverse of a matrix-Solving simultaneous linear equations – Rank of a matrix

[24 Hours]

**(Theory and problems may be in the ratio of 30% and 70% respectively)**

### **References**

1. Raymond Barnett, Michael Ziegler - Essentials of College Mathematics for Business, Economics, Life Sciences and Social Sciences
2. Sancheti and V.K.Kapoor -Business Mathematics
3. M.Raghavachari -Mathematics for Management
4. Dr. P.R. Vittal - Business Maths & Statistics
5. Chandran & Agarwal - Business Mathematics -
6. Raghavachari - Mathematics for Management,

### 3C03 COM (COMPL - III): BASICS OF RESEARCH METHODOLOGY

**No of credits: 3**

**Contact hours: 54 Hours per week 3**

Objective : To help the degree students to understand how to do research in the area of  
Commerce and Management

#### **MODULE I : Introduction to Research**

Meaning – Purpose – Criteria of good research – Social Science Research – Functions or uses of social science research – limitations of social science research - steps in Research Process (a brief account only) (10 Hours)

#### **MODULE II : Research Problem**

Meaning of research problem – mode of selection – sources of problems - formulation of problem – formulation process (7 Hours)

#### **MODULE III: Research Design or Plan**

Meaning – importance – contents of a research plan (5 Hours)

#### **MODULE IV : Data Collection**

Primary data – primary data collection methods : - observation , interview, questionnaires , schedules .  
Secondary Data – meaning – sources of secondary data . (7 Hours)

#### **MODUE V :Sampling techniques**

Characteristics of good sampling – method of sampling : random sampling methods – simple, stratified, systematic, cluster, area , multi-stage. Non probability sampling : - Convenient sampling, judgment sampling, quota sampling, snow ball sampling. Advantages and Disadvantages of sampling. (10 Hours)

#### **MODULE VI: Report Writing**

Introduction, types of reports, steps in report writing, contents of the research report , footnote and bibliography (15 Hours)

#### **Reference**

1. Research Methodology by O. R. Krishnaswamy
2. Research Methodology by P. Saravnavel
3. Research Methodology by C. R. Kothari
4. Research Methodology by D. K. Bhattacharya
5. Methodology of Research in Social Sciences by Dr. O . R. Krishnaswamy and Dr . M. Ranganatham

## **3B05COM(CORE –V): ADVANCED ACCOUNTING**

**No of credits: 4**

**Contact hours: 90 Hours per week 5**

**Objectives of the Course:**

To help the students to acquire the conceptual knowledge of accounting for special transactions and to help them to learn the techniques of preparing the accounts and financial statements

**Module I**

Inland Branch Accounts: Accounts of dependent and independent branches – Debtors system, Stock and Debtors Method (at cost price and invoice price) – Incorporation of branch transaction in the books of H.O. Reconciliation and preparation of consolidated accounts – Departmental accounts - Accounting procedure- Analytical day book and ledgers- Allocation of expenses – Inter departmental transfers- Provision for unrealized profit. (30 hours)

**Module II**

Self balancing – meaning and object- Difference between self balancing and sectional balancing – Control accounts- Transfer from one ledger to another – contra balances – Sectional balancing – preparation of total Debtors and Total creditors account. (15 hours)

**Module III**

Accounting from Incomplete Records- Features, Drawbacks-Computation of profit by Net Worth method-Final Statement of Affairs – Conversion of single entry to double entry – preparation of final accounts (20 hours)

**Module IV**

Royalty accounts – Types of royalties – Minimum rent – Short workings – Recoupment of short workings - Entries in the books of the parties (10 hours)

**Module V**

Hire Purchase, Installment systems and Lease Accounting: Hire purchase – interestcalculations- repossession – installment sale.- concept operating and financial lease (theory only) (15 hours)



**References :**

1. Advanced Accounts Volume II : Shukla: M.C., T.S.Grewal and S.C.Guptha (S.Chand&Co.,New Delhi)
2. Advanced Accountancy, Volume II :Guptha R.L. and M.Radhaswami (Sulthan Chand & Co. New Delhi)
3. Corporate Accounting :Maheshwari. S.N. and S.K.Maheshwari, (Vikas publishing House, New Delhi)
4. Corporate Accounting : Ashok Sehgal and Deepak Sehgal,(Taxman Publication, New Delhi)
5. Corporate Accounting : S.P. Jain and K.L.Narang (Kalyani Publishers, New Delhi)
6. Fundamentals of Corporate :Monga, J.R (Mayur Paper backs, New Accounting Delhi)
7. Financial Accounting :B.K.Banerjee (PHI Pvt.Ltd.New Delhi)

### 3C04 COM(COMPL - IV): BUSINESS REGULATORY FRAMEWORK

**No. of Credit: 3**

**No of Contact Hours: 4 Hrs per week / 72Hrs**

#### **Module I**

ICA 1872-Nature of Contract- Essential elements with examples- classifications- Offer & acceptance- Legal Rules- Kinds of Offer- Revocation- Consideration- Stranger to contract without consultant void- Exceptions- Stranger to contract- Capacity to contract- Free consent- Coercion- difference—Mistake- Misrepresentation- Fraud- Legality of object- Illegal and Unlawful agent- Opposed to public policy- Contract expressly declared to be void (22 Hours)

#### **Module II**

Discharge of contract- Remedies for Breach of contract- Quasi Contract (8 Hours)

#### **Module III**

Special contract- Identity- Guarantee- Distinctions- Kinds of Guarantee- Nature of Surety- Rights & Duties- Discharge of surety- Contract of Agency- Creation of Agency Termination- Rights & Liabilities of Agents- Personal Liability of Agents (14 Hours)

#### **Module IV**

Bailment & Pledge- Definition- Essentials- Difference- Kinds of Bailment- Duties of Bailor & Bailee- Lien (8 Hours)

#### **Module V**

Sale of Goods Act 1930- Essentials- Difference between Sale & Agreement to sell- Conditions & warranties- Distinctions implied – Conditions & Warranty- Doctrine of Caveat Emptor- Exceptions- Transfer of Property- Rights & Duties- Unpaid seller- Auction Sale (20 Hours)

#### Books for Reference

1. Mercantile Law, Chowla&Garg
2. Mercantile Law, N D Kapoor
3. Business & Corporate Law , L R Potti
4. Mercantile Law , M C Shukla

## 4A13 COM(COMMON XII):ENTREPRENEURSHIP

**No.of Credits:4**

**No.of Contact hours: 72 Hours per week 4**

### **Objective:**

To help the students understand the concepts of entrepreneurship and to develop the Entrepreneurial skills among them.

### **Module I**

Concept of Entrepreneurship- meaning- definition- importance – Definition of an entrepreneur- Functions- Distinction between entrepreneur and a manager – types of entrepreneurs- Intrapreneur- Theories of entrepreneurship-Practices to entrepreneurship development –Concept of women entrepreneurship- problems of women entrepreneurs

(15 hours)

### **Module II**

Factors affecting Entrepreneurial Growth-Rural entrepreneurship-role of entrepreneur in Economic development

(4 hours)

### **Module III**

Entrepreneurial motivation – Motivating factors – Achievement Motivation – Entrepreneurial competencies –Developing competencies – Institutional efforts and role of Government in developing entrepreneurship- Entrepreneurship Development Programme (EDP) - Need- Objectives-Course content and curriculum of EDP – Phases of EDPs

(15 hours)

### **Module IV**

Micro, Small & Medium Enterprises- MSMED Act 2006 - Characteristics- Objectives- Importance – MSMEs as a seed bed of entrepreneurship – Entrepreneurship incubators - Problems and prospects of MSMEs- Incentives and subsidies- Taxation benefits to MSMEs – Institutional finance to entrepreneurs – Preparation of Project Report for a Micro enterprise (General engineering unit/Bakery unit/Soda making unit/Mineral water unit/Garment unit/Pappad unit or the like)

(20hours)

### **Module V**

Institutional Support to Small Entrepreneurs- National Small Industries Corporation Ltd- Small Scale Industries Board- State Small Industries Development Corporations- MSME Institute-DICs- Industrial Estates- Specialized institutions- Technical Consultancy Organisations

(18 hours)

### **References**

1. Entrepreneurial Development : P. Saravanavel
2. Entrepreneurial Development :C. B Gupta and N.P Sreenivasan
3. A complete Guide to Successful Entrepreneurship; G.N. Pandey
4. Business and Society Davis Keith and Williams C. Fredarick
5. Entrepreneurship : R.V. Badi& N V Badi
6. Entrepreneurship Development : S.S. Khanka
7. Entrepreneurship : Robert D Hisrich and Michael P Peters
8. Project Evaluation and Management :Singh and Mahadev
9. MS MED Act 2006

## 4A14 COM (COMMON - XIV):ENVIRONMENT STUDIES

**No.of Credits: 4**

**No.of Contact hours: 4 Hrs per week / 72 Hrs**

**Objective:**

*The objective of the course is to give a general awareness to the students about the environment and sociology, and environmental pollutions.*

**Module I**

Brief discussion on the components of the environment, Effect of environmental degradation with example and effect on population. Brief outline of the Environment (Protection) Act 1986 should be discussed including effect on companies, contravention, penalties and return requirement. Relevance of environment legislation to Business Enterprise- Legislation vs. Social obligation of business.- Role of NGOs like green peace in Environmental protection. [20Hours]

**Module II**

**Ecology** : Brief outline on Elements of Ecology; Brief discussion on Ecological balance and consequences of change, principles of environmental impact assessment. Environmental Impact Assessment report (EIA) and requirement of EIA for startup manufacturing enterprise. [10 Hours]

**Module III**

**Air Pollution and Control** : Brief Outline of Atmospheric composition, Brief understanding of energy balance, climate, weather, dispersion. Sources and effects of pollutants in the industrial context- primary and secondary pollutants- acid rain, green house effect, depletion of ozone layer, global warming, standards and control measures required by industry in compliance to The Air (Prevention and Control of Pollution) Act 1989. [15Hours]

**Module IV**

**Water Pollution and Control** : Brief Discussion on Hydrosphere, natural water, pollutants: their origin and effects, river/lake/ ground water pollution, The financial implication of water pollution control and steps required to be taken by industry e.g.Sewerage treatment plant- water treatment plant- Standards and control in relation to the effect of legislation by Central and State Boards for prevention and control of Water Pollution. [15Hours]

**Module V**

**Land Pollution** : Brief understanding of lithosphere, Pollutants (municipal, industrial. commercial, agricultural, hazardous solid waste); their original effects, collection and disposal of solid waste, recovery & conversion methods in relation to an industrial enterprise with discussion about the financial implication in a business enterprise. [12Hours]

**Reference:**

1. Environmental Science :Cunnigham, TMH
2. Environmental Studies :A.K.De&A.K.De, New Age International
3. Environmental Pollution Control Engineering :C.S.Rao, New Age International
4. Environmental Management : N.K. Oberoi, EXCEL BOOKS
5. Ecosystem Principles & Sustainable Agriculture :Sithamparanathan, Scitech

## **4B07COM(CORE –VII): INCOME TAX LAW AND PRACTICE-1**

**No. of Credits: 4**

**No. of Contact Hours: 90 Hours per week 5**

### **OBJECTIVE :**

To give the students the basic idea about the theoretical aspects of income tax in India, and to give an idea about the computation of income under different heads.

### **MODULE I :**

Introduction to Income Tax – Evolution of Income Tax – Income Tax Act 1961 - Finance Act – Income Tax Rules 1962 – Basic Concepts – Definition of different terms – Agricultural Income – Capital and Revenue Receipts – Expenditure and Losses . (10 Hours)

### **MODULE II :**

Residence and Incidence of Tax - Determination of Residential Status of different types of assesses – problems – scope of total income – incomes exempt from tax (for individual assesses) – problems – computations – tax holiday. (15 Hours)

### **MODULE III:**

Heads of Income – Incomes included under salary – allowances – perquisites and their valuation – profits in lieu of salary – Provident Fund – computation of income from salary - Income from house property – basis of charge – annual value in different cases – self occupied – let out – vacancy and unrealized rent – deductions - computation of income from house property (30 Hours)

### **MODULE IV:**

Profits and gains of business or profession – meaning of business – profession – vocation – basis of charge – general principles – deduction in computing business income – computation of profits from business – deduction in computing professional income – computation of gain from profession – depreciation – block of assets – written down value method- Capital gain – basis of charge – capital asset – short term and long term – transfer – capital gain in special cases – exemption from capital gain – computation of income from capital gain (25 Hours)

**MODULE V:**

Income from other sources – basis of charge – general and specific items of income – interest on securities – deductions allowable – computation of income from other source .

(10 Hours)

**Note : Consider the Current rate for calculations**

**Questions should be asked based on provisions relating to current assessment year.**

**References :**

1. Income tax Law and Accounts :Dr.H.C.Mehrotra and S.P.Goyal
2. Income tax Law and Practice :Dr.Bhagavathi Prasad.
3. Income tax Law and Practice : Gaur and Narang
4. . Income tax Law and Practice :B.S.Raman.
5. . Direct taxes Law and Practice : Dr.Vinod K. Singhanian&Dr.KapilSinghanian

## **4B08 COM (CORE - VIII): INFORMATICS SKILLS**

**No.of Credits -3 (2 Theory+1Practical)**

**No.of Contact hours -72(Theory: 36 hours; Practical: 36 hours) Hours per week 4**

**Objective :**To Know the Fundamentals of Computers and to Understand how to use Computer applications in day to Day Applications. Also to update and expand basic informatics skills and attitudes relevant to the emerging knowledge society and also to equip the students to effectively utilize the digital knowledge resources for their chosen courses of study.

### **Module I**

**Overview of information Technology.**Features of Modern Personal Computer and Peripherals – Computer Networks – Types of Networks – Components of Networks –Topology – Internet – Uses of Internet. [8 Hours]

### **Module II**

**Social Informatics:** IT and society – issues and concerns -Digital divide – Cyber ethics – Cybercrimes – Cyber Laws – Cyber addictions- Information over Load – Health Issues – Guide lines for Proper Usage of computers and internet. E Waste. [8 Hours]

### **Module III**

**IT Applications :**E Governance– overview of IT Application in Medicine, Health care, Business and Commerce.– Industry. [4 Hours]

### **Module IV**

**Programmes for Office Management:** MS word – window concepts – Menus, tiles, Edit, View, tools, tables,Mail Merge. MS Excel – Spread sheet – operators - Arithmetic – Relation Functions –Formulae – Payroll Preparation. [8 Hours]

### **Module V**

**Computerized Accounting (Using Accounting Software)** Meaning, features and advantages of computerised Accounting – Company Creation- Accounts Information- Ledger – Groups– Cost Centres – Accounts with inventory- stock item and stock Group creation – voucher – types - entry – P/L A/c, B/S, Bank Reconciliation. [8 Hours]

**Theory: 2 Hours/ Week**

**Practical: 2 Hours/ Week –Office Automation, Word, Excel, Accounting Package, Preparation of Ledgers, Stock Creation, Trial Balance, Final Accounts**

**Reference.**

1. V. Rajaraman : Introduction to Information Technology. PrenticeHall
2. Technology in Action : Pearson.
3. Alexis Leon & Mathews Leon : Computer Today, Leon Vikas.
4. A.K.Nandani& K.K Nandani : Tally 6.3
5. V.K.Jain : Computer Fundamentals
6. Vijay Kumar Khurana : Management of Information Technology - B.Jolly&K.S.Jolly;  
SunithaPrakasan.



## **4C05 COM (COMPL - V): CORPORATE LAW & BUSINESS REGULATION**

**No. of Credit : 3**

**No of Contact Hours: 4 Hrs per week / 72 Hrs**

### **Module I**

Companies Act 2013- Definition- Features- Classification- Authorities of Company Law- Central Govt- Company Law Board- SEBI- Liquidity- Court- Registration (15 Hours)

### **Module II**

Formation of Company- Promotion- Registration & Incorporation- Commencement of Business- Minimum Duties & Liabilities- Lifting Corporate Veil (15 Hours)

### **Module III**

Memorandum of Association- Contents- Articles of Association- Contents- Difference- Table A- Alterations-Doctrine of Ultravires- Constructive notice & indoor management- Prospectus- Contents- Statement I Lieu of Prospectus- Misstatement in prospectus (15 Hours)

### **Module IV**

Members of Company- Acquiring membership-Termination of membership-Rights-Duties- Obligations- Directors- Appointment-Qualifications & Disqualifications- Retirement & Removal of Directors (15 Hours)

### **Module V**

Company meeting- General Meeting- Board Meeting- Class Meeting- Essential valid Meetings- Motion- Resolution- Methods of voting (6 Hours)

### **Module VI**

Winding up- Modes of Winding Up- Compulsory- Cultivator- Liquidator- Rights & Duties of Liquidator (6 Hours)

1. Mercantile Law, M C Shukla
2. Business Law, R S N Pillai, Bhagavathi
3. Company Law P P Scogna
4. Business & Corporate Law, L R Potti

## **5B10 COM (CORE - X): COST ACCOUNTING**

**No of credits: 4**

**Contact hours: 90 Hours per week 5**

### **Objectives of the Course:**

To acquaint the students with the basic concepts used in Cost Accounting and the various methods involved in Cost Accounting system.

### **Module I**

Introduction to Cost Accounting – concepts, objectives and advantages – Financial Accounting and Cost Accounting – Elements of cost and cost classification – cost centre and cost unit- preparation of cost sheet (10 hours)

### **Module II**

Materials :- Concepts- centralized buying - purchase procedure– Store records – Bin card and stores ledger - methods of material issue pricing (FIFO, LIFO, Simple and weighted averages), stock levels, E.O.Q, ABC Analysis, VED Analysis, FSN Analysis – Essentials steps for material control (15 hours)

### **Module III**

Labour: - Concepts - Time keeping. Time booking- Wage system -Time rate, Piece rate, Taylor's differential piece rate system - Incentive system of wage payment -Halsey and Rowan Plan - Treatment of idle time - overtime – Labour turnover meaning and causes (theory only) (15 hours)

### **Module IV**

Over heads: - Concepts- classification, Allocation and apportionment -Direct, Simultaneous equation, Step ladder and Repeated distribution method- Absorption of overheads -Labour hour rate method and machine hour rate method – calculation of machine hour - Under and over absorption of overheads – meaning and treatment (theory only) (20 hours)

### **Module V**

Methods of Costing –Job costing, batch costing, unit costing, operating costing- Process costing: features – typical process industries - process accounts- normal loss and scrap- abnormal loss and gain – Explanation on Joint products and by products – Contract costing: Special features- Cost plus contract- Escalation clause- Sub contract- Retention money- Treatment of cost of plant – Profit on incomplete contract- Transport/service costing :Calculation of rate per passenger kilometer (30 hours)

**References**

1. Cost Accounting principles and Practice :Iyengar . S.P
2. Cost Accounting :S.P.Jain& K.L. Narang
3. Management Accounting : Dr. S.P.Gupta
4. Management Accounting :R.K.Sharma&S.K.Gupta
5. Cost Accounting :JawaharLal.
6. Cost Accounting : Dr. A.D. Agarwal
7. Practical Cost Accounting : Dr. A.D. Agarwal
8. Lectures on Costing :Swaminathan

## **5B11 COM (CORE - XI): CORPORATE ACCOUNTING**

**No of credits: 4**

**Contact hours: 90 Hours per week 5**

### **Objectives of the Course:**

To help the students to acquire the conceptual knowledge of Corporate Accounting, and to help them to learn the techniques of preparing the financial statements.

### **Module I**

Final Accounts of Companies – Preparation of final accounts – Balance Sheet – Profit & Loss Account – P&L Appropriation account (problems in new format only) – compulsory transfer to Reserve (Corporate dividend tax needn't be considered)

(22 hours)

### **Module II**

Acquisition & Profits prior to incorporation – meaning computation of purchase consideration – acquisition entries in the books of the company (closing entries in Vendor's books not necessary) – computation of profits prior to incorporation – treatment of profit or loss prior to incorporation – collection of debtors and payment of creditors on behalf of vendors

(12 hours)

### **Module III**

Accounting for Amalgamation and reconstruction – Meaning and types of amalgamation – Amalgamation in the nature of Merger and Amalgamation in the nature of purchase – Comparison of both – Accounting methods – Pooling of interest method and purchase method – Purchase consideration – Accounting entries in the books of both transfer and transferee companies (excluding intercompany holdings) – Reconstruction – types – internal and external reconstructions – Accounting entries only

(25 hours)

### **Module IV**

Liquidation of companies – Meaning and types of winding up – Statement of Affairs – Deficiency or Surplus Accounts – Liquidator's Final Statement of Account

(16 hours)

### **Module V**

Accounts of Banking Companies - Introduction – final accounts in new format – Balance Sheet – Profit & Loss Account with relevant schedules – slip system of posting – NonBanking Assets (NBA) and Non Performing Assets (NPA) – Classification of advances – Computation of provision for doubtful debts and rebate on bills discounted

(15 hours)

**References :**

1. Advanced Accounts Volume II : Shukla: M.C., T.S.Grewal and S.C.Guptha (S.Chand&Co.,New Delhi)
2. Advanced Accountancy, Volume II :Guptha R.L. and M.Radhaswami (Sulthan Chand & Co. New Delhi)
3. Corporate Accounting :Maheshwari. S.N. and S.K.Maheshwari, (Vikas publishing House, New Delhi)
4. Corporate Accounting : Ashok Sehgal and Deepak Sehgal,(Taxman Publication, New Delhi)
5. Corporate Accounting : S.P. Jain and K.L.Narang (Kalyani Publishers, New Delhi)
6. Fundamentals of Corporate :Monga, J.R (Mayur Paper backs, New Accounting Delhi)
7. Financial Accounting :B.K.Banerjee (PHI Pvt.Ltd.New Delhi)

## 5B12 COM (CORE- XII): AUDITING

**No.of Credits -3**

**No.of Contact hours -72 Hours per week 4**

### **Objectives :**

To create awareness among the students about the modern trends and practices of auditing and to inculcate the skills for independently undertaking the audit work.

### **Module I**

Introduction to Auditing – Origin – meaning – definition – objectives – advantages – limitations – classifications of Audit – Private audit – Statutory audit – Govt. Audit – Internal Audit- Interim audit-Continuous audit – Cost audit – Management audit – Performance audit – Social audit.

[14 Hours]

### **Module II**

Audit Procedure – Audit Planning - Audit Programme - Audit note book – Audit working papers – internal check – Internal control – test checking – routine checking – Vouching – Meaning and Objectives – Procedure – Essentials of a valid voucher – vouching of cash transitions – verifications and valuation of assets and liabilities – Meaning and differences between verifications and valuation – General Principles of valuations of assets – valuations of plant and machinery – Freehold and lease hold property – Trade creditors – Standards on Auditing (S A) (an overview)

[20 Hours]

### **Module III**

Audit of Limited Companies:- Appointment of auditors –qualifications –disqualifications- rights – duties – liabilities : civil and criminal – remuneration – lien – status – removal – audit procedure – audit of share capital – issue – Transfer – Transmission – reissue -forfeiture- audit report – contents– types.

[20 Hours]

### **Module IV**

Specialized Audit – Audit of partnership firms- education institutions – clubs – charitable trusts [8 Hours]

### **Module V**

Auditing and Computer Information System (CIS) – EDP Audit -Computer Information Systems Environment (CISE) — risks and controls – Auditing around the computers – Auditing through computers - Audit Trails – Computer Assisted Audit Technique [ CAAT ] : Computer based accounting Vs Conventional accounting system- – Generalized Audit software (GAS) Packages.

[10 Hours]

### **Reference**

1. B.N Tandon, S. Sudarsanam& S. Sundarabahu : A Handbook of Practical Auditing
2. T.R Sharma : Auditing
3. DinkarPagare : Practice of Auditing
4. M.S Ramaswamy : Principles and Practice of Auditing
5. B.S Jolly & KS Jolly, Information Technology :ShuchitaPrakashan(Pvt. Ltd) Allahabad.
6. VarshaAinapure&MukundAinapire : Auditing and Assurance

## **5B13 COM (CORE - XIII): INCOME TAX LAW AND PRACTICE- II**

**No. of Credits: 4**

**No. of Contact Hours: 90 Hours per week 5**

### **OBJECTIVE**

To give the students an idea about the computation of total income and to know the relevant provisions relating to assessment.

#### **MODULE I**

Clubbing of Income – provisions – deemed income – aggregation of income – set off and carry forward of losses –Computation of Gross total Income - Deduction from gross total income  
Computation of total income – assessment of individuals - computation of tax – assessment of partnership firms – computation of tax

(35 Hours)

#### **MODULE II**

Assessment of Companies – minimum alternative tax – computation of total income and tax liability – assessment of Co-operative Societies – Computation of total income and tax liability

(20 Hours)

#### **MODULE III**

Income Tax Authorities and their powers – CBDT – Powers and functions – Commissioner of income tax – powers and functions – income tax officers. Assessment procedure – types of return – procedure for filing return – PAN – types of assessments – rectification of mistakes

(10 Hours)

#### **MODULE IV**

Deduction of Tax at Source – items of income from which tax is deducted at source – collection of tax at source - Advance payment of tax – refund of tax – Penalties and prosecution –provisions .

(25 Hours)

Note : Questions should be asked based on provisions relating to current assessment year.

### **Consider the Current rate for calculations**

#### **References :**

1. Income tax Law and Accounts :Dr.H.C.Mehrotra and S.P.Goyal
2. Income tax Law and Practice :Dr.Bhagavathi Prasad.
3. Income tax Law and Practice : Gaur and Narang
4. Income tax Law and Practice :B.S.Raman.
5. Direct taxes Law and Practice : Dr.Vinod K. Singhanian&Dr.KapilSinghanian

## **6B15 COM (CORE - XV): MANAGEMENT ACCOUNTING**

**No of credits: 4**

**Contact hours: 90 Hours per week 5**

### **Objectives of the Course:**

To acquaint the students with different methods involved in Cost Accounting system. To provide the students an understanding about the use of financial and cost accounting data, for planning, control and managerial decision making

### **Module I**

Introduction to Management Accounting – Meaning- Definitions, Objectives, Uses- Scope of Management Accounting – Management Accounting Vs Financial Accounting, Management Accounting Vs Cost Accounting,

(5 hours)

### **Module II**

Analysis and interpretations of financial statements – concepts, types of analysis, tools of analysis [Comparative Financial statements, Common- size Financial statements, Trend analysis]- Ratio analysis – concepts, definition, advantages, limitations- Types of ratios- Liquidity ratio, Solvency ratios, Activity ratios, Profitability ratios and Market test ratios (construction of final accounts are not expected)

(30 hours)

### **Module III**

Cash flow statements – Concepts, Definitions, Uses and Preparation of Cash Flow Statement (in vertical form only)

(10 hours)

### **Module IV**

Marginal Costing: - Concept, Definitions-Features-CVP Analysis- B.E.P- P/V Ratio- Simple BEP Chart – Managerial uses of Marginal Costing ( Price fixation, Make or buy decisions, key factor)

(20 hours)

### **Module V**

Budgetary control – Concepts, Objectives, Classification of budgets- Preparation of Cash and Flexible budgets – Installing and administering budgetary control

(15 hours)

### **Module VI**

Standard Costing – Definition- Uses and limitations - Procedure for setting standards – Analysis of variances – Material Cost Variance - Material Price and Material Usage Variance – Labour Cost Variance – Labour Rate, Labour Efficiency and Idle Time Variance (Mix and Yield variance excluded)

(10 hours)

### **References**

1. Management Accounting : Sharma R.K & SasiGuptha
2. Management Accounting : N.M Singhvi & Bodhan Wale
3. Management Accounting : RSN Pillai & Bhagavathi
4. Management Accounting : S.K. Gupta & R.K Sharma.
5. Management Accounts : S N. Maheswari
6. Management Accounts : S.P. Gupta



## **6B16 COM (CORE - XVI):INTERNATIONAL BUSINESS**

**No. of Credits - 4**

**No. of Contact hours – 90 Hours per week 5**

### **Module I : International Business:**

International Business: – Meaning – Drivers – Evolution – Strategies of going International; – Globalization: Meaning – Features – Significance – Benefits – Problems/Limitation – Forms & Stages of Globalization; – MNC: - Meaning – Nature – Goals – Defense & Critics – India's Presence.

[20 Hours]

### **Module II : International Trade:**

International Trade: Meaning – Benefits – Limitations – Foreign Trade Policies – Outward & Inward – Barriers to Trade – International Trade Agreements – Types; – WTO & its role; – Integration Between Countries – Levels – Impact – Growth of Trading Blocks – Major Trading Blocks – Merits & Limitations.

[20 Hours]

### **Module III :India's Foreign Trade:**

India's Foreign Trade Policy – Role of RBI in Foreign Trade – EXIM Policy – Export Promotion Schemes – EPZ – EOU – SEZ – ECGC – EXIM Bank – EIC; – Documentation in International Trade: - Export Trade Documents: - Commercial Documents – Transport Documents – Financial Documents – Government Documents; – Export Declaration Forms – Export Certification – Certification of Origin - UPCDC Norms.

[20 Hours]

### **Module IV : International Finance:**

International Finance: Nature – Environment of International Financial; – Foreign Exchange (FOREX) Market – Participants – Types of Transactions – Financial Instruments; – Exchange Rate – Theories (PPP – IFE – IRP); – Forex Risk – Forex Risk Management

[20 Hours]

### **Module IV :Financing International Operations:**

Financing International Operations – FDI – Meaning – Definition – Strategies – Modes of FDI Investment – Benefits & Costs; – FII Investment – FII in India; – Depository Receipts

[10 Hours]

### **Reference:**

1. International Business :Aswathappa
2. International Business : Francis Cherunilam
3. International Financial Management : Kevin
4. International Marketing : Larceny & Bhattacharya
5. International Business :P. Subba Rao, Himalaya Publishing House, New Delhi
6. International Business :V K Bhalla and S Shiva RamuAnmol Publications Pvt Ltd., New Delhi

## **6B17 COM (CORE - XVII):MODERN BANKING**

**No.of Credits -4**

**No.of Contact hours -90 Hours per week 5**

### **Objectives:**

To provide to the students an understanding of the fundamentals of banking and impart basic knowledge of modern banking practices

### **Module I**

**Structure of Indian Banking System** – Commercial banks-functions– Balance sheet of a commercial bank – Principles -Safety, Liquidity, Profitability, Diversification of risks-Conflict between liquidity and profitability-Multiple Credit Creation: Process and Limitations

[20 Hours]

### **Module II**

**Reserve Bank of India** - Constitution – Functions –Monetary and Non - Monetary Promotional and Regulatory-Methods of credit control-Quantitative and Qualitative methods.

[15 Hours]

### **Module III**

**Banker and customer** – General and special relationship – Debtor and Creditor – Bailor and Bailee, Principal and Agent, Trustee and Beneficiary – Rights– Lien, Set off, appropriation, interest and charges and Law of Limitation - Obligations–HonourCheques, Maintain Secrecy – Opening of Bank Account – General Precaution to be taken by a Bank – closing of bank account - Negotiable Instruments – Promissory Note, Bill of Exchange, Cheque – Features – Crossing – types – Endorsement – types.

[25 Hours]

### **Module IV**

**Loans and advances** – Principles of sound lending – Forms of advance – Loan, cash credit, overdraft, discounting – Modes of creating charge- lien, pledge, hypothecation, Mortgage-Assignment -Reverse mortgage –Guarantee.

[15 Hours]

### **Module V:**

**Technology in Banking:** Need and importance –Virtual banking-ATM, Credit card, Debit card, Tele Banking- internet banking, SWIFT (Society for Worldwide Inter- bank Financial Tele communication), Concept of Core Banking – Universal banking

[15 Hours]

### **Reference:**

1. Banking Theory and Practice - K.C Shekar
2. A Text book of banking - M. Radhaswamy& S.V. Vasudevan
3. Banking: Law and Practice - P.N. Varshny
4. Banking Law and Practice K P M Sundharam and P N Varshney — Sultan chand& Sons
5. Banking: Law and practice in India - Maheshwari
6. Banking and financial system - Vasant Desai
7. Modern Banking - K.P.M.Sundaram and E.N.Sundaram, Sultan Chand & Sons, New Delhi.

## **6B18 COM (CORE - XVIII):FINANCIAL MARKETS & SERVICES**

**No.of Credits: 3**

**No.of Contact hours -3 Hrs per week / 54 Hrs**

**Objectives of the Course:**

*To familiarize the students with the constituents of financial market, their interactions and the services provided by them.*

**Module I**

**Indian financial system** : structure- Role of financial system in economic development –Financial markets and instruments

[4Hours]

**Module II**

**Money market** –Meaning –functions and components – Call money market – Treasury bill-Commercial bills – Commercial papers – Certificate of Deposits

[12Hours]

**Module III**

**Capital Market-** Meaning –Primary and Secondary market - Stock exchange- Functions Dematerialization and Depository services

[13 hours]

**Module IV**

**Financial Services** – meaning – nature and scope – Types - Merchant banking –Meaning, objectives and functions- Mutual funds – Meaning, objectives and types of schemes - Credit rating –Meaning, functions and major agencies (CRISIL,ICRA,CARE)- Factoring- Meaning, objectives and mechanism - Venture Capital –meaning, features, funding pattern

[25Hours]

**Reference:**

1. Financial Institutions & Markets : I.M. Bhole.
2. Marketing of Financial Services : V.A Avdhani.
3. Investment Management : V.K Bhalla.
4. Indian Financial System :Vasant Desai
5. A profile of Indian Capital Market :Vinayakan.
6. Financial Markets & Services : Gordon and Natarajan.
7. Financial Markets, Institutions & Services : N.K Gupta & Monika Chopra Hours]

**6B20 COM (CORE - XX): PROJECT**

## Optional -A CO- OPERATION

### 3B06 COM (CORE - VI Optional A: CO-OPERATION-I) CO-OPERATIVE PRINCIPLES

**No.of Credits -3**

**No.of Contact hours -90 Hours per week 5**

**Objective:**

To acquaint the students with the principles of cooperation, and to familiarise them with the evolution of cooperative movement in India.

**Module I**

**Philosophy and genesis of co-operative movement** - Definition and meaning of Cooperation – ICA definition- characteristics. Evolution of co-operative principles – Rochdale principles- Reformulated principles of 1966- Redefined principles of 1995 – Application of the principles. Co-operatives as economic enterprises – its importance – differences between other forms of organizations and co-operative enterprise. Role of co-operatives in market economy – Role of co-operatives as social organizations – cooperation as a balancing factor – Co-operation as peoples’ movement – membership of co-operatives- Autonomy and democratic control - co-operation and role of leadership.

[20 Hours]

**Module II**

**Evolution of co-operative movement:** Origin of co-operative movement in England – Experiments of Robert Owen (Doctrine of circumstances – Friendly societies – Labour colonies – Labour exchanges) – Rochdale pioneers – C.W.S.S, C.W.S.-Credit societies in Germany –Raiffiesen and Schulze movement –Dairy and poultry co-operatives in Denmark – M.P.C.S in Japan –industrial co-operatives in China – collective farms in U.S.S.R. Marketing co-operatives in U.S.A – Consumer societies in Sweden.

[25 Hours]

**Module III**

**Co-operation in India** – Early experiments –Frederic Nicholson’s Report-Maclegan committee on co-operation –Co-operative planning Committee 1945 – All India Rural Credit Survey Committee –All India Rural Credit Review Committee –CRAFICARD – Kapoor Committee –Recent trends in co-operative movement with special reference to Kerala.(An over view)

[20 Hours]

**Module IV**

**Rural credit** – classification of credit based on period, purpose and security- structure of co-operative credit- three tier and two tier credit –Multi agency approach to rural credit- Institutional agencies providing rural credit – state aid to co-operatives – central assistance to co-operatives- promotional efforts and monetary assistance by government, NCDE, NHB, NABARD, etc; National Rural Credit Stabilisation Fund and National Rural Credit (L.T.O) Fund. Constitution and working of N.C.D.C – Role of N.C.D.C in the development of non credit co-operatives.

[10 Hours]

**Module V**

**Co-operative education and training** – objectives and significance – International cooperative Alliance –National Co-operative Union of India –constitution and working – NCCT-NCCE-VAMNICOM-ICM.Structural arrangement for training –co-operative training centres- co-operative training colleges- member education units – other functions. Publicity and propaganda –journal - co-operative week celebrations-co-operative flag  
CAPE-ACSTI-KICMA.Organisational, structural and administrative set up of co-operative department.

[15 Hours ]

**Reference:**

1. Theory and Practice of Co-operation in India : Kulkarni
2. Co-operative Movement in India : J. Banerjee
3. Co-operative Movement in India : F.M Hough
4. Co-operation –Principles and Practice : T.N Hajela
5. All India Rural Credit Survey Report
6. Co-operation in India : Dr. M.S Mathur
7. Theory, History and Practice of Co-operation : R.D Bedi
8. Co-operation at Home and Abroad : C.R Fay
9. Co-operation in Foreign Countries :Rajagopalan
10. Co-operation in India and Abroad : K.P Bhatnagar

## **4B09 COM (CORE -IX Optional A : CO-OPERATION-II )**

### **MANAGEMENT OF CO-OPERATIVES**

**No.of Credits - 3**

**No.of Contact hours -72 Hours per week 4**

**Objectives:**

To acquaint the students with the management and administration of different types of cooperative institutions functioning in India

**Module I**

**Primary Agricultural Credit Societies** – definition –membership-constitution, objectives and working-differences between Primary Agricultural Credit Societies and Farmers Service co-operative Societies – Deposit Scheme –crop loan system –scale of finance – preparation of annual credit limit statement – seasonality in lending and recovery – linking of credit with marketing –kissan credit card –procedure to sanction loans –needfor credit planning –development action plan –district credit plan of lead bank. Central co-operative banks – membership- objectives-constitution of board of management – problems – over dues- suggestions for improvement. Kerala State co-operative Bank – origin- membership-constitution- objectives- constitution of board of management – problems and suggestions for improvement. [16 Hours]

**Module II**

**Long term credit** –Agricultural and rural development – need for separate institutions -debentures – trustee- trust deed- Debenture Redemption Fund- Primary co-operative agricultural and rural development bank- constitution, objectives and working – Kerala State Co-operative Agricultural and Rural Development Bank -membership- constitution of board of management – objectives and working-problems and suggestions forimprovement. Procedure in granting loans- over dues in long term credit societies –NPA. [10Hours]

**Module III**

**Non Agricultural credit societies** – Primary co-operative urban banks- membership constitution, objectives and working (in brief)- Employees credit societies – membership –constitution, objectives and working (in brief)- Co-operative housing societies – importance and advantages – types of housing societies – HOUSEFED –constitution and working (in brief) – sources of funds – problems. [10Hours]

**Module IV**

**Marketing and Processing Societies** – meaning of co-operative marketing – need, importance and advantages of co-operative marketing –types of marketing societies general and commodity based marketing - objectives and functions of primary marketing societies –Kerala State Co-operative Marketing Federation Ltd.- Kerala State Co-operative Rubber Marketing Federation Ltd.- Brief study of the functioning of NAFED- Processing co-operatives – meaning and importance of co-operative marketing. Consumer co-operatives – Origin of consumer cooperative in India – need and importance of consumer co-operatives - constitution and workingof primary co-operative consumer stores –Kerala State Co-operative Consumers’ Federation - National Co-operative Consumers Federation- role of

consumer co-operatives in holding the price line –active price policy- double compartmental system- super market- Neethistore - students’ consumer store. [16 Hours]

### **Module V**

**Industrial co-operatives** – handloom societies – types- cottage and factory type constitution, objectives and working of primary handloom weaver’s co-operative societies and HANTEX-Coir co-operatives – types-objects and working- primary coir societies and COIRFED-Dairy co-operatives - Anand pattern-objects and working primary milk producer’s co- operative society- Regional co- operative milk producer’s union –MILMA-NDDB- problems of dairy co-operatives –role of co-operatives in rural development. Brief study of handicraft societies –khadi and village industrial societies – serified societies –SC/ST societies –Federation (brief study) –NSFDC –Fisheries societies- MATSYAFED –Federation of women co-operative societies – Labour contract cooperatives –Farming societies –Motor transport co-operatives- Co-operative printing press- Dinesh Beedi –RAIDCO-SPCS-CAMPCO-RUBCO-IFFCO-KRIBHCO. [20 Hours]

### **Reference:**

1. Theory and practice of co-operation in India : Kulkarni
2. Co-operative Movement in India : J. Banerjee
3. Co-operation Principles and Practice : T.S Balan
4. Co-operation principles and practice : T.N Hajela
5. Co-operation in India : Dr. M.S Mathur
6. Theory, history and practice of co-operation : R.D Bedi
7. Madras co-operative Manual co-operativemovement in India : Vol. I, II and III : J.C Rajan
8. Co-operation at home and abroad : C.R Fay
9. Co-operation in foreign countries :Rajagopalan
10. Co-operation in India and abroad : K.P Bhatnagar.



**5B14 COM (CORE -XIV Optional A : CO-OPERATION-III)**  
**CO-OPERATIVE LAWS**

**No.of Credits - 3**

**No.of Contact hours -72 Hours per week 4**

**Objectives:**

*To give the students an awareness of the historical perspective of co-operative legislation in India and Kerala and to equip them with the Kerala Co-operative Societies Act and Rules,1969.*

**Module I**

**History of co-operative legislation in India (A brief study)-**Co-operative Credit Societies Act 1904 and Co-operative Societies Act 1912- Multi- State Co-operative Societies Act (Broad features only)  
 [15 Hours]

**Module II**

**Kerala Co-operative Societies Act and Rules 1969** – Historical back ground- Definitions – Registration of co-operative societies –Byelaws - Amendment- Amalgamation and division of societies- Membership- Rights, duties and liabilities – Withdrawal and expulsion.  
 [12Hours]

**Module III**

**Management of co-operatives** – general body –Managing committee- disqualification of committee members- Election of committee members- supersession of committee. Election of president –Privileges of societies- State aid to co-operatives.Appointment of employees - Co-operative Service Examination Board.  
 [15 Hours]

**Module IV**

**Meetings** – Annual general body meeting- special meetings. Requisites of a valid meeting – agenda - quorum- notice- minutes- duties of secretary- inspection, inquiry and surcharge.  
 [15 Hours]

**Module V**

**Winding up of societies** – liquidator- powers- cancellation of registration .  
 [15 Hours]

**References:**

1. Kerala Co. op. Societies Act and Rules : Pillai
2. Kerala Co.op Societies Act and Rules : T.S Balan
3. Law for the Co.operatives : R.O Bedi
4. Law and Management of Co. operatives : Trivedi. BB
5. Co.operative Act and Rules : N.A Kareem
6. Co.operative Societies Act and Rules :Thankappan
7. Bare Act
8. Cooperative democracy in Action : O.R Krishnswami
9. Legal aspects of co-operation : P.M Natesan,N.JShaji, &V.S Anilkumar.

**6B19 - COM (CORE -XIX-Optional A : CO-OPERATION-IV)**  
**CO-OPERATIVE ACCOUNTING AND LEGISLATIONS**

**No.of Credits -3**

**No.of Contact hours -90 Hours per week 5**

**Objectives:**

*To familiarize the students with co-operative accounting techniques and the legal framework underlying it.*

**Module I**

**Co-operative Accounting** – features- Day book- R &D – Profit and loss account – Balance sheet. [20 Hours]

**Module II**

Books and Registers to be maintained by co-operative societies- Audit of co-operative societies– Director of Co-operative Audit. [15 Hours]

**Module III**

**Disputes and their settlement** – co-operative Arbitration court- co-operative Tribunal. [15 Hours]

**Module IV**

Co-operative unions – objectives- constitution- functions . [10 Hours]

**Module V**

Indian Penal code – offence – misappropriation- criminal breach of trust –Forgery .Code of civil procedure – service of summons – properties not liable to attachment-writ– injunction- appeal, revision and review. Indian Evidence Act – oral and documentary evidence - primary and secondary evidence – Kerala Chitties Act. [30 Hours]

**Reference:**

1. Cooperative Societies Laws in Kerala : P.N Mohanan
2. Kerala Co.op Societies Act and Rules : T.S Balan
3. Law for the Co.operatives : R.O Bedi
4. Law and Management of Co. operatives : Trivedi. BB
5. Co-operative Act and Rules : N.A Kareem
6. The Co-operative Societies Act and Rules ,1969 : E.O Thankappan
7. Advanced Accountancy-Vol. I : S.P Jain & K.L Narang

**OPTIONAL - B**  
**COMPUTER APPLICATION**

**3B06COM (CORE -VI Optional B : COMPUTER APPLICATIONS-I )**  
**COMPUTER LANGUAGES AND SOFTWARES**

**No.of Credits -3**

**No.of Contact hours -90 ( Theory :54 hours; Practical : 36 hours) Hours per week 5**

Objectives:

To acquire knowledge about programming languages and to develop skill in creating power point and blog.

**Module 1**

Computer –meaning – definition-characteristics-merits- demerits- historical overview-generation of computer-structure-peripherals-memory-types of memory-input output devices-secondary storage devices latest invention- (10 Hours)

**Module II**

**System concepts-** meaning –definition-features-types of system -control in information system-system design-Operating system –introduction-functions-objectives-types of operating system- multi programming-batch processing -online, real-time processing system-time sharing-Concept of GUI-Artificial Intelligence-Virtual Reality-application of both (14 Hours)

**Module– III**

**Computer language** –low level and high level language-meaning-features-advantages and disadvantages- Programming concepts – Algorithms – Flow charts –symbols used -Characteristics – programming languages –C ,C++ ,java uses and importance (26 Hours)

**Module IV**

Software-meaning definition, types –concept of blog – creation of blog-uses- (18 Hours)

**Module V**

**Application software Power point** – Introduction- pp terminology-features-steps-creating presentation-uses of PowerPoint presentation –advantages –demerits-preparing master slides-Formatting-layouts-insertions -color scheme-adding graphic presentation-special effects-running the slide show (22 Hours)

**Theory – 3 Hours / week.**

**Practical – 2 Hours / week. -Blog creation & Power point presentation**

**References**

1. Programming in ANSI C, E. Balagurusamy.
2. The C programming Language, Kernighan BW and Ritchie.
3. Let us C, Yeshavant. P. Kanetkar.

**4B09COM (CORE -IX OptionalB: COMPUTER APPLICATIONS-II )  
ELECTRONIC DATA PROCESSING & COMPUTER APPLICATION**

**No.of Credits -3**

**No.of Contact hours -72 (Theory :36 hours; Practical : 36 hours) Hours per week 4**

**Objectives:**To update and expand skills in electronic data processing and computer application in business operation

**Module I**

Data processing and numbering system – data-information –Types of dta processing – manual – mechanical – electronic – data processing cycles – advantages of EDP – Logical Gates – AND, OR, NOT, NOR, Truth Tables – Number System – binary – octal – hexadecimal [15 Hours]

**Module II**

Operating System – Introduction of DOS – Internal Commands – External Commands – Introduction to Windows – Elements of Windows – Cascading & tiling of windows – my computer – windows explorer – Searching of files & Folders – Creating, deleting, renaming, copying and merging folders – Free software – Linux an overview [15 Hours]

**Module III**

E Commerce – E Governance – B2B- B2C, C2C, C2B – Busiess application of E commerce- E Governance – Online financial service- Stock Trading – E Broking – E Filing - Page maker-use – characteristics- Creating & opening publications –working in Page maker window – setting defaults and preferences – viewing pages – using tool box – working with text & Graphics – moving between pages – adding & deleting pages – naming & saving a publication- closing a publication [20 Hours]

**Module V**

Soft ware packages in Social Science (SPSS) Starting SPSS- terminology – Case – Variables and levels – system missing & User – defined missing values – identification numbers & case numbers – Procedure – Fundamental definitions – Sample, descriptive statistics –nominal scale – ordinal scales- interval scales – ratio scales – quantitative data – categorical or frequency data- Parametric & non parametric data & test- dependent & independent variables - [22 Hours]

**Theory: 2 Hours/week**

**Practical: 2 Hours/week – Page maker & SPSS**

## **5B14COM (CORE -XIV OptionalB: COMPUTER APPLICATIONS-III ) PROGRAMMING LANGUAGES**

**No.of Credits -3**

**No.of Contact hours -4 Hrs per week / 72 Hrs (Theory : 36 hours; Practical : 36 hours)**

**Objectives:**

1. To acquire knowledge about programming in Java.
- 2 To develop skill in writing program in Java.

**Module I**

**Introduction to object oriented programming** – characteristics of OOP – data abstraction – encapsulation – polymorphism – inheritance – advantages of OOP – application of OOP.

[8 Hours]

**Module II**

**Introduction to java** – features – elements of java language – execution fo Java program – JVM – Java tokens – java character set – data types – keywords – identifiers – literals – operators – expressions – constants – variables and data types. Looping – if statement etc

[16 Hours]

**Module III**

**SQL – DDL- DML- statements** – CREATE TABLE – constraints – Adding constraints – NOT NULL – UNIQUE – PRIMARY \_ KEY \_ ALTER TABLE MODIFY \_ TABLE\_ DROP- TABLE INSERT- INTO – UPDATE – SELECT statements- DISTINCT – WHERE Clause using relational and logical operators with WHERE clause- conditions based on a range – BETWEEN – Conditions based on pattern matches – LIKE – Aggregate – functions – AVG – sum count – MAX – MIN- group by – order by

[18 Hours]

**Module IV**

**The internet and WWW-** overview – meaning – history – internet services- Using browser – navigating Web – Closing browsing – Searching – web sites – mail services – features of internet – on line business – commerce & WWW -

[16Hours]

**Module V**

**Hyper text Markup Language** - structure of HTML document – Tags & attributes – Syntax of Tag – starting and ending Tag – tag without ends – document content – document element - <html> tag – dir and lang – attributes; <title> tag; documents body - <body> tag; text basics, division & paragraphs, heading, physical styles tags, action attributes, <input> tags – Controls, check boxes, radio buttons, submission buttons, hidden fields, labeling & grouping

[14 Hours]

**Theory – 2 Hours / week.**

**Practical – 2 Hours / week.Java, HTML, SQL**

**References:**

1. The Complete Reference, Herbert Schildt.
2. Programming with Java, A Primer, E. Balagurusamy.

**6B19COM (CORE -XIX OptionalB: COMPUTER APPLICATIONS-IV)  
ACCOUNTING PACKAGES – TALLY**

**No.of Credits -3**

**No.of Contact hours – 5 Hrs 90 Hrs( Theory :54 hours; Practical : 36 hours)**

Objectives :

1. To acquire knowledge about the tally accounting package.
2. To develop skill in preparing financial statements in Tally.

**Module I**

Basics of accounting, features of tally – technological advantages, Transactions, journal, ledger, rules for debit and credit.- Creation of company – group – default group – ledger etc. – modification – alteration – deletion of company – voucher entry – default vouchers – [22Hours]

**Module II**

Creation of trial balance – balance sheet – profit and loss account.- detailed form- centred form- alterations – Printing reports & options [19 Hours]

**Module III**

Cost category – cost centre – stock group – stock item – ( creation – deletion – alteration – modification). [20 Hours]

**Module IV**

Budget – creation– deletion – alteration – Bank Reconciliation Statements [9 Hours]

**Module 5**

TDS – Generation & reconciliation of TDS – Chellan- filling of returns E TDS returns – Calculation of VAT – Fund flow statements- Calculating financial ratios (20 Hours)

**Theory – 3 Hours / week.**

**Practical – 2 Hours / week. – Final Statement of Account preparation, Cost Category, Bank reconciliation , Budgets , TDS & VAT**

**Record keeping is compulsory for internal valuation**

**References**

Tally 7.2 – Nadhani.

Accounting – Laser.

## OPTIONAL- C

### FINANCE

#### 3B06 COM (CORE - VI Optional C: FINANCE- I)

##### FINANCIAL MANAGEMENT

**No.of Credits -3**

**No.of Contact hours -90 Hours per week 5**

**Objective :**To acquaint the students with the fundamental concepts of corporate finance and the various finance functions.

#### **Module I**

**Financial Management** :-Finance - Definition - Nature and scope of finance function - Financial Management - Meaning – Scope, goals and Objectives – Profit maximization Vs Wealth maximization – finance, investment and dividend functions - Role of finance manager.

[10 Hours]

#### **Module II**

**Economic evaluation of investment projects:** Nature of investment decisions – investment evaluation criteria – payback period method -Average rate of return method- - NPV – IRR – capital rationing- capital budgeting under risks and uncertainty.

[25 Hours]

#### **Module III**

**Working capital management:** Meaning, significance, factors and types of working capital –principles of working capital management- operating cycle method of estimating working capital.

[15Hours]

#### **Module IV**

**Capital structure** — Meaning- planning the pattern of capital structure – factors influencing the pattern of capital structure- Theories of capital structure – NI approach ;NOI approach- traditional theory- MM theory (Theoretical aspects only)

[20 Hours]

#### **Module V**

**Cost of capital:**– Meaning- significance – determination of cost of capital – computation of cost of individual components – cost of debt – preference capital –equity capital-retained earnings-Weighted average cost of capital.

[20 Hours]

#### **Reference :**

1. Financial Management : I.M Pandey.
2. Financial Management : M.Y Khan & S.P. Jain
3. Financial Management : Dr. Prasannachandra
4. Financial Management : Ravi M. Kishore
5. Financial Management : Dr. S.N. Maheswari
6. Financial Management : P.V. Khulkarni
7. Financial Management : R.K Sharma &ShasiK.Guptha.

**4B09 COM (CORE -IX OptionalC :FINANCE II )**  
**INVESTMENT MANAGEMENT**

**No.of Credits - 3**

**No.of Contact hours -72 Hours per week 4**

**Objectives:**

*To facilitate the students to understand the concepts of investments and to enable them to analyze the risk and returns characteristics of securities and portfolios in a dynamic market environment.*

**Module I**

**Investment** – Meaning, Definition- Need – Benefits –Investment alternatives-Investment attributes-Investment v/s speculation-gambling- Role in Economic Development – Factors influencing investment-Different investment avenues – Salient features – Return – Meaning – Types – Risk- Meaning – Sources of Risk. [12 Hours]

**Module II**

**Securities:** Different types of securities – Equity, Debt, Preference shares, money market instruments, Government securities, swaps, options and derivatives,- Mutual funds: entities in mutual funds –types of schemes [15 Hours]

**Securities Market:** Participants-Primary Equity market- methods of raising equity-stock invest- book building-Secondary equity market-BSE and NSE-Sensex and Nifty-Procedure for buying and selling share. [18 Hours]

**Module IV:**

**Security Analysis:** Fundamental analysis – Economic, industry and company analysis – Technical analysis – Tools- Charting techniques-(Basic concepts only) [12 Hours]

**Module V**

**Portfolio Management Process** : Meaning and types of portfolio – Scope and Objectives of Portfolio Management - Portfolio Management Process (Theory only) [15 Hours]

**Reference:**

1. Investment Analysis & Portfolio Management :Prasanna Chandra, Tata McGraw Hill
2. Investment Management :Saram Harry , Prentice Hall
3. Portfolio Management : Francis &Aricher
4. Portfolio Management : S. Kevin
- 5.Security Analysis & Portfolio Management : PunithavathyPandyan, VikasPublishing House, Pvt. Ltd



**5B14 COM (CORE-XIV Optional C :FINANCE-III)**  
**SERVICE TAX AND VAT**

**No.of Credits -3**

**No.of Contact hours -72 Hours per week 4**

**Objectives:** This course aims to provide knowledge on the Indirect Tax. On successful completion of this course, the student should be able to file Service tax and VAT

**Module I**

Indirect Taxes – Introduction - Special features of Indirect Taxes - Contribution to government revenues - Taxation under the constitution - Advantages and Disadvantages of Indirect Taxes - Basic Concepts of service and service tax – extent and application – Charge of service tax(section 66B)- Person and deemed person – Definition of service - concept of section 65B(44)- Role of consideration – Activity of transfer of title of goods/immovable properties – transactions in Money or actionable claim

(15 HOURS)

**Module II**

General provisions on Point of taxation – Valuation, Section 67 and Section 67(13) – Inclusion/exclusion of expenditure from cost – Bundled service, Section 66F(3) – Payment of service Tax, Section 68 – Manner of Payment – Credit of service tax - Registration and Records for service tax

(20 HOURS)

**Module III**

Taxable services – Renting of immovable property – Transport of passenger and related services – Transportation of goods – Goods Transport Agency- Works contract service – Tour Operator Service

(12HOURS)

**Module IV**

Concepts and scope of VAT – VAT and CST – Operation of VAT – Variance of VAT – Extend of credit on input/ capital goods – methods of computation of VAT – Merits and demerits – concept of input and output tax – Input tax credit, meaning and scope – Utilisation and treatment of credit – Small dealers – meaning and treatment – Compensation scheme – VAT Incentives - Registration and cancellation (General and Kerala VAT Act 2003) – VAT invoice – VAT records – VAT Return - Assessment and audit .

(25 HOURS)

**Consider the Current rate for calculations**

**Books for Reference:**

1. V.S. Datey, “Indirect Taxes”, Taxmann Publications (P) Ltd., New Delhi 2002
2. Balachandran, “Indirect Taxation”, Sultan Chand &Co., New Delhi 2006.
3. R.L. Gupta &V.K.Gupta, “Indirect Tax”
4. VineethSodhani –“Indirect Tax laws- Module II” Tax Mann Publications (P) Ltd., New Delhi 2002
5. Muhd Rafi – –“Indirect Tax laws- Bharat Publishing House in Karol Bagh, Delhi
6. Bangar’s –“Indirect Tax laws– AadhyaPrakashanPvt. Ltd
7. Kerala VAT Act

**6B19 - COM (CORE -XIX-Optional C :FINANCE -IV)**  
**CORPORATE TAX PLANNING**

**No.of Credits -3**

**No.of Contact hours -90 Hours per week 5**

**Objective:** To provide in-depth knowledge of direct tax laws and their impact on decision making.

**Expected learning outcome:** Students will get working knowledge regarding legitimate way of tax planning under different provisions of the Income-tax Act, 1961. A study of this paper will be helpful in taking different financial/managerial decisions after taking into consideration the impact of direct tax laws.

**Module I**

Tax planning, Tax management, Tax evasion, Tax avoidance. Corporate tax in India - Types of companies - Residential status of companies and tax incidence - Tax liability and Minimum Alternate Tax- Tax on distributed profits [12 Hours]

**Module II**

Tax planning with reference to setting up of a new business: Locational aspect, nature of business, form of organization - Tax planning with reference to financial management decision -Capital structure, dividend including deemed dividend and bonus shares - Tax planning with reference to specific management decisions -Make or buy; own or lease; repair or replace- Tax planning with reference to employees' remuneration - Tax planning with reference to sale of scientific research assets - Tax planning with reference to receipt of insurance compensation - Tax planning with reference to distribution of assets at the time of liquidation- [40 Hours]

**Module III**

Special provisions relating to non-residents - Double taxation relief - Provisions regulating transfer pricing - Advance rulings [15 Hours]

**Module IV**

Tax planning with reference to business restructuring – Amalgamation – Demerger- Slump sale- Conversion of sole proprietary concern/partnership firm into company - Transfer of assets between holding and subsidiary companies [23 Hours]

**References:**

1. Singhania, Vinod K., KapilSinghania and Monica Singhania, “Direct Taxes Planningand Management” ,Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish., and Ravi Gupta, “Corporate Tax Planning and Management” , BharatLaw House, Delhi.
3. Pagare, Dinkar., “Direct Tax Planning and Management” , Sultan Chand and sons,New Delhi.
4. Goyal, S.P., “Direct Tax planning” ,SahityaBhawan, Agra.
5. Acharya, Shuklendra and M.G. Gurha, “Tax Planning under Direct Taxes” , ModernLaw Publication, Allahabad.
6. Mittal, D.P., “Law of Transfer Pricing” ,Taxmann Publications Pvt. Ltd., New Delhi.

**Journals**

1. Income Tax Reports, Company Law Institute of India Pvt. Ltd., Chennai.
2. Taxman, Taxmann Allied Services Pvt. Ltd., New Delhi.
3. Current Tax Reporter, Jodhpur.

**OPTIONAL - D**  
**MARKETING**  
**3B06COM (CORE -VI Optional D : MARKETING-I )**  
**MARKETING PRINCIPLES**

**No.of Credits -3**

**No.of Contact hours -90 Hours per week 5**

**Objectives :**

To provide basic knowledge about the concepts, principles, tools and techniques of marketing

**Module I**

**Introduction**-Marketing – Meaning- Nature scope and importance of marketing-modern concepts of marketing – marketing functions.

[10 Hours]

**Module II.**

**Marketing mix:** Marketing mix – meaning- importance- product- meaning- product planning and development – product life cycle (PLC) – Product time/ mix- Building brand equity- packing- labeling- product positioning.

[20 Hours]

**Module III**

**Pricing-** Meaning and definition- steps in pricing – pricing strategies – types- consumer reactions – factors influencing consumer reactions.

[15 Hours]

**Module IV.**

**Channels of distribution-** Meaning and definition – Physical distribution – middlementypes-functions of middlemen- factors to be considered in selecting channels – modern channels of marketing – tele-marketing - internet marketing- net work marketing customer relationship marketing.

[25 Hours]

**Module V.**

**Services Marketing:** Introduction – nature-types- bank marketing - insurance- tourismconsultancy – hospitals (An Overview).

[20 Hours]

**References:**

1. Principles of Marketing - Philip Kotler
2. Fundamentals of marketing - William Stanton
3. Marketing Management - VS Ramaswamy& S Namakumari
4. Marketing Management - RajanSaxena
5. Marketing Management - Sherlakar .S.A
6. Marketing Management - Raman B.S
7. Services Marketing - S.M. Jha
8. An . Essence of Services Marketing - Pay naAdrim
9. Services Marketing - Christopher .H Lovelock

## 4B09COM (CORE -IX Optional D : MARKETING-II)

### CONSUMER BEHAVIOUR

**No.of Credits - 3**

**No.of Contact hours -72 Hours per week 4**

#### **Objectives :**

To enable the students to understand the factors and processes underlying the buying behavior of consumers.

#### **Module I**

**Introduction to Consumer Behaviour-** A managerial & consumer perspective; Need for studying consumer behaviour- Applications of consumer behavior knowledge; current trends in Consumer behaviour; Market segmentation & consumer behavior [12 hours]

#### **Module II**

**Individual determinants of Consumer behaviour:** Consumer needs & motivation; personality and self concept; consumer perception; learning & memory; nature of consumer attitudes; Consumer attitude formation and change [15 hours]

#### **Module III**

**Environmental determinants of consumer behaviour:** Family influences; the influence of culture; subculture & cross cultural influences; group dynamics and consumer reference groups; social class & consumer behaviour. [15 hours]

#### **Module IV**

**Consumer decision making process-** types of buying- straight buy- Modified re-buy- New task buying- types of products & decision making process- conveyance goods, shopping goods specialty goods Steps in decision making process - problem recognition- need, description, information – search- evaluation of alternatives – selection criteria- buying- post purchase behavior. [18 hours]

#### **Module V**

**Concept of Consumer Satisfaction;** Working towards enhancing consumer satisfaction; sources of consumer dissatisfaction; dealing with consumer complaint. Concept of consumerism; consumerism in India; the Indian consumer; Reasons for growth of consumerism in India-Relevance of Consumer Protection Act, 1986.

[12 hours]

#### **References**

1. Consumer behaviour :Hawkings, Best Mc.Graw Hill International .
2. Consumer behaviour : Leon. G Schiffman
3. Consumer behaviour- Concepts & Applications :Loudson Dalla
4. Principles of Marketing : Philip Kotler
5. Consumer Behaviour In Marketing Strategy : John .A. Howard.
6. Consumer Behaviour In India :Anitha Ghatale
7. Problems of Consumer Behaviour in India : A. Sarkar
8. Consumer Behaviour :Sontakki

**5B14COM (CORE -XIV Optional D : MARKETING-III)  
PROMOTION MANAGEMENT**

**No.of Credits - 3**

**No.of Contact hours – 72 Hours per week 4**

**Objectives :**

This course is intended to familiarize the students with the theory and practice of advertising and the sales promotion measures and techniques.

**Module 1.**

**Promotion:** Meaning and definition – importance of sales promotion- promotion mix tools-factors deciding promotion mix.

[15 Hours]

**Module II.**

**Advertising** – meaning, objectives & importance - advantages – advertising effects – economic and social – advertising agency-advertising budgets - media – types – print - radio- TV & others – advantages & disadvantages.

[18 Hours]

**Module III.**

**Personnel Selling:** Meaning- importance- principles of personal selling- steps in personal selling process

[12 Hours]

**Module IV**

**Sales promotion and publicity:** Objectives – purpose- dealer promotion- consumer promotion- methods and techniques – publicity- meaning, scope and objectives elements of publicity- public relations- press relation.

[22 Hours]

**Module V**

**Advertisement Copy:** Preparation of advertisement copy- project work

[5 Hours]

**Reference:**

1. Advertising : Morris James .S
2. Advertising theory & practice :Sandya C.H and Trybanger
3. Marketing Practices and Marketing Strategy : B. Rasheed Ajay.
4. Foundations of Advertising Theory &Practice :Chunnawalia& K.C Sethia
5. Sales Promotion : Tony Puelus
6. Advertisement Management :Aaker Paul.

**6B19COM (CORE –XIX- Optional D : MARKETING-IV)**  
**MARKET RESEARCH**

**No.of Credits -3**

**No.of Contact hours -90 Hours per week 5**

**Objectives :**

To enable the students to understand the process, tools and techniques of marketing research.

**Module I**

**Marketing Research: Introduction** – Meaning - definition- importance- nature and scope- objectives- Marketing Information System- need, importance and types- market research Vs marketing research- limitations. [15 Hours]

**Module II**

**Marketing Research Process:** Problem identification – definition – developing a research proposal – research design – meaning and importance – steps in marketing research process. [15 Hours]

**Module III**

**Sources of Data:** Primary and secondary data- Relative advantages and disadvantages; methods of collection of primary data; construction of questionnaire and interview schedule; scaling and measurement; Sampling designs and sample size- decisions; organizing data collection & field force - collection methods- observationsquestionnaire- interview schedule – pilot survey and online survey. [20 Hours]

**Module IV**

**Data analysis & interpretation:** Need and importance –Editing, coding and tabulation of data- tools - parametric and non- parametric tests. –; techniques of data analysis; testing of hypothesis; tests of significance; analysis of associations; analysis of experiments; interpretation of data. [30 hours]

**Module V**

**Report Writing and Presentation:** Role & types of report; content of report; principles of report preparation; Presentation & Communication. [10 Hours]

**Suggested assignment :** Preparation of a project report based on the market survey of a consumer product.

**References:**

1. Marketing Research : David. J Lucle& Ronald S. Robin
2. Marketing Research : Measurement & methods – Donald. S Tull& Dell Hoclis
3. Marketing Research Principles: Applications and cases - Sharma D.D
- 4 Marketing Research :Geol .B.S
5. Market Research : Paul Hague
6. Statistical Methods : S.P Guptha
7. Business Statistics : B.N Gupta
8. Research Methodology : O.R Krishnaswamy.
9. Research Methodology : C.R. Kothari



**OPEN COURSES**  
**5D01COM(Open Course-1):BASIC ACCOUNTING**

**No. of Credits: 2**

**No. of Contact Hours: 36 Hours per week 2**

**Objectives:**

To enable the students to acquire knowledge of accounting principles and practice

**Module- I**

**Introduction** :Basic Accounting concepts - Kinds of Accounts – Double Entry BookKeeping – Rules of Debit and Credit.

[6Hours]

**Module- II**

**Recording of Transactions:** – Preparation of Journal and Ledger Accounts- Simpleproblems .

[8 Hours]

**Module- III**

**Subsidiary books** - cash book – types of cash book – problems(single column and twocolumn only) - purchase book - sales book - sales return - purchase return books –Journal proper

[6 Hours]

**Module - IV**

**Trial balance** – Meaning and purpose-Preparation of trial balance

[6 Hours]

**Module -V**

**Financial Statements** –Trading and Profit & Loss Account – Balance sheet – Simple Problems

[10Hours]

**(Theory and problems may be in the ratio of 30% and 70% respectively)**

**Reference Books:**

1. Grewal, T.S: Double Entry Book Keeping
2. Jain and Narang: Advanced Accountancy
3. Shukla and Grewal: Advanced Accountancy
4. Gupta and Radhaswamy: Advanced Accountancy
5. Gupta R.L: Advanced Accountancy

## **5D01COM (Open Course-1): FINANCIAL SERVICES**

**No. of Credits: 2**

**No. of Contact Hours: 36 Hours per week 2**

### **Objective:**

To give an understanding to the students about the various financial services rendered by the commercial banks and financial institutions in India in the globalised economic scenario.

### **Module I**

**Financial system**-Meaning-Nature and Role- Indian Financial System-Financial Intermediaries: Banking Institutions.-Non- Banking Institutions: Mutual Funds-Insurance companies -Housing finance Companies-Financial markets-Capital Markets & Money Markets -Financial Instruments: short-medium-long term

[15 Hours]

### **Module II**

**Financial Services**-meaning-importance- components-Depository Services- Custodial services-Credit Rating-Credit rating agencies- procedure-methodology-symbols and grades.Factoring- Forfeiting - merchant Banking-Leasing-Hire purchase-Guaranteeing-Portfolio management-Under writing-Venture capital. (Basic Concepts only)

[16 hours]

### **Module III**

**Stock broking**- Stock brokers-Sub brokers-Foreign brokers- Stock market trading-Derivative trading

[5 hours]

### **Reference:**

1. Indian Financial System Bharati V .Pathak
2. Merchant Banking and Financial services Dr .S.Gurusamy
3. Indian Financial system Dr .S. Gurusamy
4. Indian Financial system P.N.|Varshney D.K.Mittal
5. Financial Services D.Joseph Anbarasa , V.K.Boominathan P.Manoharan & G.Gnanaraj
6. Financial Services : M.Y Khan. .

## 5D01COM (Open Course –I) E-COMMERCE

**No.of Credits -2**

**No.of Contact hours -36 Hours per week 2**

### **Objectives :**

To give an understanding to the students about the need for E-commerce, its operational framework, the major areas of E- Commerce applications and to give an exposure to the cyber laws.

### **Module I**

**Introduction :** Business operations – Basic features – Elements- limitations of traditional commerce – E-commerce- origin- growth- basic technologies- features- components advantages- limitations- types of E-commerce.

[6 Hours]

### **Module II**

**E-Commerce – operational framework & security .** Computer system- Hardware –Software- Networks- Types- Extranet- Internet- Basics- feature- internet-services- Email– Internet Addressing – URL- www- web browsers- types- internet protocol- HTML –HTTP- Internet vulnerable- Hacking, Data theft, vandalism, cyber frauds, cookies, spanner etc- protection measures- pass words- firewalls, encryption , website protection .

[10Hours]

### **Module III**

**Web Commerce:** Electronic market place- features- advertising and online marketing purchase online- Handling money on net – Electronic Payment Systems- types- credit cards- electronic Cheque- Electronic Data Interchange – meaning, components- business application.

[10 Hours]

### **Module IV**

**Cyber Laws:** Information Technology Act 2000 – scope- definitions – objectives authentication of electronic records – powers of central Govt.- Certifying authority duties of subscribers – digital signature- private key, public key- penalties and adjudication - CRAT- Offences.

[10 Hours]

### **Reference:**

1. Information Technology : BS Jolly & K.S Jolly (Suchitha Prakashan)
2. A profile of information Technology-Computer Digest : HR Banerjee (Jaico)
3. Electronic Commerce : Efraim Turban, Jae Lee, David King & Michael Chung (Pearson Edn. Asia, Delhi)
4. Frontiers of electronic commerce : Ravi Kalkotta & Andrew B Whinston (Wesley, Delhi)
5. E-Commerce John Wiley & Sons, Heary Et al.

**5DO1COM (Open Course- I) INSURANCE AND RISK  
MANAGEMENT**

**No. of credits : 2**

**No. of contact hours : 36 Hours per week 2**

**Objective**

The objective of this course is to give an exposure to the students to the recent developments in the insurance industry and risk management in India.

**Module I:**

**Introduction-** Meaning, definition, nature and functions of insurance-Principles of insurance- insurance documents.

(6 hours)

**Module II:**

**Insurance sector reforms in India-** IRDA- Role and functions-TAC-Insurance Ombudsman.

(10 hours)

**Module III:**

**Types of insurance-** Meaning and features of life – Marine, Health, Fire and other diversified insurance products-Micro insurance- Rural insurance.

(8 hours)

**Module IV:**

**Insurance risk-** meaning and types-sources of risk- Risk Management : meaning and definition-personal and corporate risk management-stages in risk management process (A brief study).

(12 hours)

**Reference:**

1. Principles of Risk management & Insurance : George E Rejda
2. Risk Management & Insurance : Scott Harrington
3. Risk Management & Insurance : C. Arthur Williams
4. Insurance Industry : ICFAI Publication.

**Question Paper Pattern of Common, Core, Complimentary and Open Courses**

**Part A)** 4 questions (answer in one word) carrying 1/2 mark each - Compulsory ..... 2 marks

**Part B)** 4 out of 6 questions (answer in one or two sentences ) carrying 1 each .....4 marks

**Part C)** 6 out of 8 questions(answer in a paragraph) carrying 3 each.....18 marks

**Part D)**2 out of 3 questions (Essay type) carrying 8 each ..... 16 marks

**Total 40 marks**

**Question Paper Pattern of Courses having Practical Examinations**

**Part A)** 4 questions (answer in one word) carrying 1/2 mark each - Compulsory ..... 2 marks

**Part B)** 2 out of 3 questions (answer in one or two sentences ) carrying 1 each ..... 2 marks

**Part C)**3 out of 4questions(not more than one page) carrying 3 each..... 9 marks

**Part D)** 1 out of 2 questions (Essay type) carrying 7 each ..... 7 marks

**Total 20 marks**

## Model Questions

### 1B01 COM (CORE- I) MANAGEMENT CONCEPTS & PRINCIPLES

**Time :3 hours**

**Maximum Marks : 40**

#### PART A

**Answer all questions. Each carries ½ marks**

1. What is PERT?
2. Management optimizes constraining -----
3. The concept of administrative theory was developed by -----
4. What is MBO

[4 x ½ = 2 ]

#### PART B

**Answer any four questions. Each carries one mark.**

5. What is social audit
6. What is esprit de corps
7. What is budgeting
8. What is pen system approach
9. What is theory of expectancy
10. What is Gantt chart

[ 4 x 1= 4]

#### PART C

**Answer any six questions (not exceeding one page) Each carries three marks.**

11. “Management principles are universally applicable” critically comment
12. How policies and procedures of an organization influence planning
13. Explain scope of authority, responsibility and accountability
14. Why the study of attitude is essential for HRD
15. Critically review the contributions of Maslow theory
16. “Leaders are born and not made” Do you agree with this statement? Justify your answer
17. Discuss in what way planning and controlling are related
18. Why is it important for structuring an organization

[6 x 3 = 18]

#### PART D

**Answer any two questions. Each carries eight marks.**

19. Explain different approach to management
20. Explain recruitment functions and why such functions are important for an organization
21. Discuss how morale can influence productivity

[2 x 8 = 16]

## 1B02COM(CORE –II): Financial Accounting

Time :3 hours

Maximum Marks : 40

### PART A

Answer all questions. Each carries ½ marks

1. Document sent by the consignor to the consignee indicating the details regarding the goods sent by him is called .....
2. Accounting for understanding the contribution of natural resources to economic development and costs imposed by resource degradation is called .....
3. The result of Income and expenditure account is called .....
4. A transaction relating to erecting charges of machinery being debited to erection charges account is an example of .....

[4 x ½ = 2 ]

### PART B

Answer any four questions. Each carries one mark.

5. What is memorandum joint venture account?
6. What is capital fund?
7. Define Trial Balance.
8. What do you mean by going concern concept?
9. What is del credere commission?
10. What is accounting cycle?

[ 4 x 1= 4]

### PART C

Answer any six questions (not exceeding one page) Each carries three marks

11. What are subsidiary books? Explain the advantages of maintaining subsidiary books?
12. Define Accounting Standards. Mention its objectives.
13. What are the different methods calculating interest in account current?
14. State the basic principles which help you in deciding whether any particular item should be regarded as capital, revenue or deferred revenue.
15. Pass journal entries to rectify the following errors.
  - (a) Sale of office car recorded as sales ₹70,000
  - (b) Cash received from Lal ₹5,000 has been recorded in cash book as ₹500
  - (c) Payment for installation of machinery debited to wages account ₹1,000
  - (d) Under casting of sales book by ₹700
  - (e) Total of discount column on credit side of cash book posted to the credit ₹230
  - (f) ₹1,500 paid to Y wrongly posted to the account of X

16. From the following particulars of bills of exchange find the average due date

| <u>Date of drawing the bill</u> | <u>Amount</u> | <u>Tenure of the bill</u> |
|---------------------------------|---------------|---------------------------|
| 5.3.2012                        | 2000          | 3 months                  |
| 8.4.2012                        | 6000          | 60 days                   |
| 20.6.2012                       | 5000          | 30 days                   |
| 10.7.2012                       | 3000          | 2 months                  |

17. Williams of Chennai consigned 300 chests of tea at ₹7,000 on July 2012, to Johnson of Mumbai paying a freight of ₹14,000 and insurance of ₹7,000. Johnson sold 250 chests at ₹7,700 per chest. He spent ₹5,500 as freight and ₹3,500 as godown rent. He is entitled to a commission of 8% on sales. Show consignment account in the books of Williams
18. on 2<sup>nd</sup> January 2012, Adarsh opened an account current with Punjab National Bank and deposited a sum of ₹1,00,000. **He further deposited the following amounts.**

15<sup>th</sup> January ₹36,000    12<sup>th</sup> March ₹24,000    10<sup>th</sup> May ₹48,000

**His withdrawals are as follows:**

15<sup>th</sup> February ₹78,000    10<sup>th</sup> April ₹90,000    15<sup>th</sup> June ₹42,000

Show the account of Adarsh with Punjab National Bank . Interest is to be calculated at 7% on debit balance and 3% on credit balance.

[6 x 3 = 18]

#### PART D

**Answer any Two questions. Each carries eight marks.**

19. Following is the receipts and Payments account of Kennedy Club for the year ended 31.12.2012

| <u>Receipts</u> | ₹             | <u>Payment</u>         | ₹             |
|-----------------|---------------|------------------------|---------------|
| To Balance b/d  | 25,000        | By Salaries            | 8,000         |
| „ Subscription  | 55,000        | „ Rent                 | 9,000         |
| „ Donations     | 6,500         | „ Postage and telegram | 1,500         |
|                 |               | „ Stationery           | 900           |
|                 |               | „ Investments          | 4,000         |
|                 |               | „ Sundry expenses      | 18,500        |
|                 |               | „ Balance c/d:         |               |
|                 |               | Cash in hand           | 18,600        |
|                 |               | Cash at Bank           | 26,000        |
|                 | -----         |                        | -----         |
|                 | <b>86,500</b> |                        | <b>86,500</b> |
|                 | =====         |                        | =====         |

You are required to prepare an Income and Expenditure account and Balance sheet after making the following adjustments:

- Subscription outstanding on 31.12.2012 amounted to ₹5,000 and subscription received include ₹2,000 for 2011
  - Salaries unpaid on 1.1.2012 ₹1,500 and at 31.12.2012, ₹1,000
  - Rent was paid to the extent of ₹750 at 31.12.2012
  - One half of the donations should be capitalized.
  - On 1.1.2012, the club had sports equipment worth ₹ 25,000 and furniture ₹15,000
- 20. You are given a Trial Balance as at 31.12.2012. Prepare Trading and Profit and Loss account and Balance sheet for the period after taking into consideration the following adjustments.**

- Wages ₹1500 paid for erecting machinery was debited in wages account
- Write off depreciation on Plant 5%, furniture 6% per annum
- Provide for bad debts 5% and discount on debtors 2%



4. Stock on hand on 31.12.2012 ₹ 45,500  
 5. Provide 2% provision for discount on creditors  
 6. On 23<sup>rd</sup> December, a fire broke out and destroyed stock of the value of ₹10000. The insurance company admitted the claim for ₹6000 only and paid the amount on 10<sup>th</sup> January 2013

**Trial Balance as at 31.12.2012**

|                          | ₹             |                  | ₹             |
|--------------------------|---------------|------------------|---------------|
| Drawings                 | 15000         | Capital          | 203000        |
| Premises                 | 90000         | Bills Payable    | 2000          |
| Plant and Machinery      | 43000         | Sundry creditors | 40000         |
| Bills receivable         | 3000          | Purchase returns | 2650          |
| Stock                    | 40000         | Sales            | 115000        |
| Materials purchased      | 51000         | Commission       | 1800          |
| Manufacturing wages      | 25000         |                  |               |
| Carriage inward          | 8500          |                  |               |
| Carriage outward         | 500           |                  |               |
| Salaries                 | 5000          |                  |               |
| Rent rates and taxes     | 2800          |                  |               |
| Discount and allowances  | 1500          |                  |               |
| Cash at bank             | 25000         |                  |               |
| Cash in hand             | 400           |                  |               |
| Sundry debtors           | 45000         |                  |               |
| Repairs and replacements | 1800          |                  |               |
| Bad debts written off    | 1200          |                  |               |
| Advertisement            | 1300          |                  |               |
| Sales returns            | 2000          |                  |               |
| Oil , grease and waste   | 800           |                  |               |
| Printing and stationery  | 450           |                  |               |
| Furniture and fittings   | 1200          |                  |               |
|                          | <b>364450</b> |                  | <b>364450</b> |

21. (a) Define Joint Venture account. Distinguish between Joint Venture and Partnership.  
 (b) Swasthik Ltd of Kochi purchases 20,000 meters of tarpaulin at ₹30 per meter and sent it to Rajaratnam of Palakkad to be sold for the benefit of both. Swasthik Ltd spent ₹2000 on packing, and forwarding. Rajaratnam received the consignment and paid ₹5200 as carriage. Swasthik Ltd drew upon Rajaratnam for ₹50,000 which were duly accepted. He got it discounted for ₹48,000. Rajaratnam sold 18000 meters the whole tarpaulin at ₹50 per meter and had to pay ₹5000 as expenses. Rajaratnam was allowed a commission of 6% on sales and profits are to be shared equally. Prepare Joint Venture account in the books of Swasthik Ltd.

[2 x 8 = 16]

## 1C01 COM (COMP. - 1) BUSINESS STATISTICS

Time : 3 hours

Maximum Marks : 40

### PART- A

**Answer all questions. Each carries  $\frac{1}{2}$  Mark.**

1. ----- is a one dimensional representation
2. Representative part of a population is called
3. What is class boundary
4. Median is ----- average

4 x  $\frac{1}{2}$  =2)

### PART – B

**Answer four questions. Each carries 1 mark**

5. What is leptokurtic curve
6. Define harmonic mean
7. What is meant by frequency distribution
8. Define splicing of index number
9. Define statistical unit
10. What is permutation

(4x1=4)

### PART-C

**Answer any six questions. (Not exceeding one page) Each carries 3 marks.**

11. Distinguish between primary and secondary data
12. Discuss the merits of census study
13. Explain the properties of an ideal average
14. Discuss the problems of construction of cost of living index numbers
15. Calculate Karl Pearson's coefficient of correlation from the following details
 

|                    | X    | Y    |
|--------------------|------|------|
| Mean               | 31   | 61   |
| Standard deviation | 3.25 | 3.35 |

Sum of the product of deviation of X and Y from their respective means = 75  
Number of pairs of X and Y = 10
16. X speaks truth 5 times out of 8 and Y speaks truth 3 times out of 8. What is the probability that will contradict each other in stating the same fact
17. In a batch of 15 students 5 students failed in a test. The marks of 10 students who passed were 9, 6, 7, 8, 8, 9, 6, 5, 4, 7. What is the median of the marks of all the 15 students

18. Draw a histogram for the following grouped frequency distribution

|                 |      |       |       |       |       |       |       |
|-----------------|------|-------|-------|-------|-------|-------|-------|
| Daily income    | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
| No. of Families | 4    | 12    | 20    | 28    | 24    | 18    | 12    |

(6x3=18)

**PART- D**

**Answer any two questions. Each carries 8 marks.**

19. Explain the functions of statistics

20. Prices of a particular commodity in 5 cities are given which commodity had more stable price

|             |    |    |    |    |    |
|-------------|----|----|----|----|----|
| Commodity X | 20 | 22 | 17 | 23 | 26 |
| Commodity Y | 16 | 20 | 18 | 12 | 15 |

21. From the following find out price index number by Fisher's ideal index number

| Commodity | 2010  |     | 2014  |     |
|-----------|-------|-----|-------|-----|
|           | Price | Qty | Price | Qty |
| A         | 12    | 100 | 20    | 120 |
| B         | 4     | 200 | 4     | 240 |
| C         | 8     | 120 | 12    | 150 |
| D         | 20    | 60  | 24    | 50  |

(2x8=16)

## 2B03 COM (CORE - 3) PRINCIPLES OF MARKETING

Time : 3 hours

Maximum Marks : 40

### PART- A

**Answer all questions. Each carries ½ Mark.**

1. ----- is the policy to get success in marketing
2. ----- is the last process of marketing
3. What is Macro marketing
4. What is selling

4 x ½ =2)

### PART – B

**Answer four questions. Each carries 1 mark**

5. Define marketing
6. What is marketing mix
7. What is social marketing
8. What do you mean by market planning
9. Define market segmentation
10. What is MIS

(4x1=4)

### PART-C

**Answer any six questions. (Not exceeding one page) Each carries 3 marks.**

11. Is marketing science or art? Explain
12. Distinguish between marketing and selling
13. Explain the factors influencing marketing
14. Marketing begins before production – explain
15. What are marketing functions
16. Explain about consumer orientation
17. State various classifications of markets
18. Write note on classification of consumer goods

(6x3=18)

### PART- D

**Answer any two questions. Each carries 8 marks.**

19. Critically evaluate the problems of Indian consumer market
20. Bring out the role of marketing in the economic development of our country
21. Trace the evolution and development of marketing

(2x8=16)

## 2B04 COM (CORE- IV) HUMAN RESOURCE MANAGEMENT

**Time :3 hours**

**Maximum Marks : 40**

### PART A

**Answer all questions. Each carries ½ marks**

1. Demotion means-----
2. What is graphic rate scale
3. What is on the job training
4. What is job analysis

[4 x ½ = 2 ]

### PART B

**Answer any four questions. Each carries one mark.**

5. What is the concept of training
6. What is job grading
7. What is performance appraisal
8. What is wage incentives
9. What is dismissal
10. What do you mean by grievance

[ 4 x 1= 4]

### PART C

**Answer any six questions (not exceeding one page) Each carries three marks.**

11. Explain the functions of Trade Union
12. Discuss the process of career planning
13. What are the causes of indiscipline
14. Explain the pre requisites of sound incentive plan
15. Explain the need for training
16. What are the uses of job evaluation
17. Explain the conventional method of HRM training
18. Mention the different methods of finding labour turn over ratio

[6 x 3 = 18]

### PART D

**Answer any two questions. Each carries eight marks.**

19. Explain the objectives of HRD
20. Explain the uses of job analysis
21. Describe the process of manpower planning

[2 x 8 = 16]

**2C02COM (COMPL - I1): QUANTITATIVE TECHNIQUES FOR  
BUSINESS DECISIONS**

**Time :3 hours**

**Maximum Marks : 40**

**PART A**

**Answer all questions. Each carries ½ marks**

1.  $P(A \cup B)$  is the probability that \_\_\_\_\_ will occur.  
(a) A (b) B (c) A and B (d) A or B
2. The range of the correlation coefficient is?  
(a) -1 to 0 (b) 0 to 1 (c) -1 to 1 (d) None of the above
3. Variations that occur without any degree of regularity beyond one year is  
(a) secular trend (b) seasonal variation (c) cyclic variation (d) irregular variation
4. For the normal distribution, the mean plus and minus 1.96 standard deviations will include what percent of the observations?  
(a) 80% (b) 84% (c) 90% (d) 95% [4 x ½ = 2]

**PART B**

**Answer four questions. Each carries one mark.**

5. What are dependent and independent variable in regression.
6. What is scatter diagram?
7. What is moving average?
8. What are mutually exclusive events?
9. Define Poisson distribution.
10. What is the probability of drawing an ace or a spade from a pack of cards?  
[ 4 x 1= 4]

**PART C**

**Answer any six questions (not exceeding one page) Each carries three marks.**

11. Distinguish between regression and correlation.
12. Explain (a) Mutually exclusive events (b) Permutation (c) Combination (d) Random experiment.
13. Find coefficient of correlation from the following
 

|    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|
| X: | 10 | 12 | 15 | 13 | 22 | 25 | 20 | 24 |
| Y: | 12 | 15 | 14 | 18 | 20 | 24 | 40 | 25 |

14. Calculate the trend values by the method of least squares. Assuming that the same rate continues, what would be the sales of 2013?

|                   |   |      |      |      |      |      |
|-------------------|---|------|------|------|------|------|
| Year              | : | 2007 | 2008 | 2009 | 2010 | 2011 |
| Sales(Rs in '000) | : | 12   | 15   | 16   | 18   | 17   |

15. A bag contains 7 white and 9 black balls. 3 balls are drawn together. What is the probability that (a) all are black (b) all are white (c) 1 white and 2 black.

16. A basket contains 20 bad oranges and 80 good oranges. Three oranges are drawn at random from the basket. Find the probability that of three (a) exactly 2 (b) atleast 2 and (c) utmost 2 are good oranges.

17. Obtain the rank correlation coefficient for the following data.

|    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|
| X: | 68 | 64 | 75 | 50 | 64 | 80 | 75 | 40 | 55 | 64 |
| Y: | 62 | 58 | 68 | 45 | 81 | 60 | 68 | 48 | 50 | 70 |

18. Distinguish between binomial distribution and normal distribution.

[6 x 3 = 18]

#### PART D

**Answer any Two questions. Each carries eight marks.**

- Define time series. Explain the different components of a time series.
- From the following data of the age of Husband and the age of Wife, form the two regression equations.

|           |   |    |    |    |    |    |    |    |    |    |    |
|-----------|---|----|----|----|----|----|----|----|----|----|----|
| Husband's |   |    |    |    |    |    |    |    |    |    |    |
| Age       | : | 36 | 23 | 27 | 28 | 28 | 29 | 30 | 31 | 33 | 35 |
| Wife's    |   |    |    |    |    |    |    |    |    |    |    |
| Age       | : | 29 | 18 | 20 | 22 | 27 | 21 | 29 | 27 | 29 | 28 |

Also calculate (a) husband's age when the wife's age is 19 and (b) Wife's age when the husband's age is 40.

- There are two urns one containing 5 white and 4 black balls and the other containing 6 white and 5 black balls. One urn is chosen and one ball is drawn. If it is white, what is the probability that the urn is the second.

[2 x 8 = 16]

## 3A11COM (COMMON-XI) DISASTER MANAGEMENT

**Time :3 hours**

**Maximum Marks : 40**

### PART A

**Answer all questions. Each carries ½ marks**

1. The Bhopal gas tragedy was in the year-----
2. The Disaster Management Act was passed in the year-----
3. IMS means
4. What is land slide

[4 x ½ = 2 ]

### PART B

**Answer any four questions. Each carries one mark.**

5. Define disaster
6. What is cold wave
7. What is biological hazards
8. What is population explosion
9. What is the use of hydrology laboratory
10. What do you mean by man induced hazards

[ 4 x 1= 4]

### PART C

**Answer any six questions (not exceeding one page) Each carries three marks.**

11. Explain the functions of NEMA
12. Explain the steps to mitigate the impact of earthquakes
13. Explain the role of media in disaster management
14. Write note on industrial disaster
15. Explain the components of community preparedness plan
16. Explain the different approaches to manage the environmental hazards
17. Write note on recent tsunami hit in the coastal region of your country
18. State the functions of Meteorological observatory

[6 x 3 = 18]

### PART D

**Answer any two questions. Each carries eight marks.**

19. Explain the pre disaster stage preparedness
20. Explain the role of various disaster mitigation institutions
21. Examine the impact of natural disaster on the economic development

[2 x 8 = 16]



### 3A12 COM (COMMON - XII): NUMERICAL SKILLS FOR BUSINESS

**Time :3 hours**

**Maximum Marks : 40**

#### PART A

**Answer all questions. Each carries ½ marks**

1. Formula for scrap value is-----

a)  $p(1 - i)^n$    b)  $p(1 + i)^n$    c)  $\frac{A}{(1-i)^n}$    d)  $A(1 - i)^{-n}$

2.  $\emptyset$  is -----

a) Not a set   b) Not a sub set   c) Sub set of every set   d) Not existing

3. The solution of the equation  $4 = \frac{2}{3} X$  is-----

a) 6   b) 12   c) 8   d) 16

4. Total PV of annuity A payable for n years, with rate of interest r% p.a is

a)  $\frac{A}{i}(1 + i)^n$    b)  $\frac{A}{i}[1 - (1 + i)^{-n}]$    c)  $\frac{A}{i}(1 + i)^n - 1$    d)  $\frac{A}{i}[1 - (1 + i)^n]$

[4 x ½ = 2 ]

#### PART B

**Answer four questions. Each carries one mark.**

5. Solve  $8x + 7y = 10$

$$11x = 10(1 - y)$$

6. 13kg. of rice at ₹ 30 per kg. is mixed with 3kg. of rice at ₹ 20 per kg. what would be the selling price per kg. of the mixture, if a profit of 25% of sale is to be made?

7. Rationalize the denominator of  $\frac{\sqrt{5} + \sqrt{2}}{3 - \sqrt{2}}$

8. Find the total present value of annuity of ₹ 150 payable at the end of every year and for 10 years, rate of interest being 8% p.a.

9. Find the value of  $\frac{3a+5b}{3a+2b}$ , if a:b = 3:2.

$$\frac{3a+5b}{3a+2b}$$

10. From the following matrix, calculate A+B

$$A = \begin{bmatrix} 2 & 3 & 5 \\ 5 & 4 & 2 \\ 2 & 5 & 9 \end{bmatrix}$$

$$B = \begin{bmatrix} 5 & -9 & 6 \\ 2 & 3 & -5 \\ 4 & -9 & 7 \end{bmatrix}$$

$$A = \begin{bmatrix} 2 & 3 & 5 \\ 5 & 4 & 2 \\ 2 & 5 & 9 \end{bmatrix}$$

$$B = \begin{bmatrix} 5 & -9 & 6 \\ 2 & 3 & -5 \\ 4 & -9 & 7 \end{bmatrix}$$

$$B = \begin{bmatrix} 5 & -9 & 6 \\ 2 & 3 & -5 \\ 4 & -9 & 7 \end{bmatrix}$$

$$B = \begin{bmatrix} 5 & -9 & 6 \\ 2 & 3 & -5 \\ 4 & -9 & 7 \end{bmatrix}$$

[ 4 x 1 = 4 ]

#### PART C

**Answer any six questions (not exceeding one page) Each carries three marks.**

11. A man sells 7 horses and 8 cows at R. 2940 and 5 horses and 6 cows at Rs.2150. What is the selling price of each?.

12. Find the solution set graphically for the system of inequalities.

$$4x + y - 12 < 0$$

$$x > 0$$

$$y > 0$$

13. A debt of Rs.3000 is to be cleared in 6 equal installments, interest payable is 8% per annum. Find how much loan is amortized in the first two years.
14. Two chemicals A and B are mixed in the proportion of 4:1 and the mixture stored in a container. The same two chemicals are mixed in the proportion 7:3 and the mixture stored in another container. What quantities should be drawn from the two containers to prepare 11 litres of mixture in which two chemicals are in the proportion 8:3.
15. Construct the truth table for the compound statement  $\sim (\sim p) \wedge (\sim q)$
16. For the marriage of 2 daughters, Mr. A requires 50000 after 4 years and 60000 after 6 years from now. How much money he must deposit in a bank paying 10% compound interest p.a.
17. Solve the equation  $x + x = 6$
18. Problem from matrix [6 x 3 = 18]

### PART D

**Answer any Two questions. Each carries eight marks.**

19. Solve

$$7x - 4y - 20z = 0$$

$$10x - 13y - 14z = 0$$

$$3x + 4y - 9z = 11$$

20. Let  $P = \begin{pmatrix} 0 & 1 \\ 2 & 3 \end{pmatrix}$ ,  $Q = \begin{pmatrix} -1 & 2 \\ 4 & 3 \end{pmatrix}$ ,  $R = \begin{pmatrix} 2 & -1 \\ 6 & 5 \end{pmatrix}$   
 Prove  $P(Q+R) = PQ+PR$ .

21. Prove the following relation.

$$\sim (p \vee \sim q) \equiv \sim p \wedge q$$

$$\sim (\sim p \wedge q) \equiv p \vee \sim q$$

$$\sim (\sim p \vee \sim q) \equiv p \wedge q$$

$$p \vee q = \sim (\sim p \wedge \sim q)$$

[2 x 8 = 16]

## 3C03 COM (COMPL - III) BASICS OF RESEARCH METHODOLOGY

Time : 3 hours

Maximum Marks : 40

### PART- A

**Answer all questions. Each carries ½ Mark.**

1. The purpose of a research report is to .....the interested persons the methodology and the result of the study.
2. Research aims to analyse .....between variables.
3. The first terminal item presented at the end of the research report is .....
4. The final step in research study is .....

4 x ½ =2)

### PART – B

**Answer four questions. Each carries 1 mark**

5. What is meant by research?
6. What is meant by research problem?
7. Define social science research.
8. What is research design?
9. What is operational definition?
10. Write three sources of secondary data

(4x1=4)

### PART-C

**Answer any six questions. (Not exceeding one page) Each carries 3 mark.**

11. What are the limitations of social science research?
12. What do you mean by research hypothesis?
13. What is meant by research problem formulation?
14. What are the functions of research design?
15. What is cluster sampling?
16. What are the different sources of research problem?
17. What are the criteria of a good research?
18. What is meant by review of literature?

(6x3=18)

### Part-D

**19. What is meant by research and what are the different steps in research process?**

**20. What are the contents of a research report?**

**21. What are the different non-probability sampling techniques used in research?**

**(2x8=16)**

### 3B05COM(CORE –V): ADVANCED ACCOUNTING

Time : 3 hours

Maximum Marks : 40

#### PART A

**Answer all questions. Each carries ½ marks**

1. When Head Office meet branch expenses, .....account is to be debited in Head office books.
2. First payment on signing the agreement in HP system is called .....
3. Excess of Minimum rent over royalty is called .....
4. In single entry system, the amount of credit sales is ascertained by preparing ..... account.

[4 x ½ = 2 ]

#### PART B

**Answer four questions. Each carries one marks**

5. What is sectional -balancing?
6. What do you mean by partial repossession?
7. What is meant by Statement of Affairs?
8. What is the journal entry for inter departmental transfer at cost price?
9. What is sublease?
10. What is Contra account in self-balancing?

[ 4 x 1= 4]

#### PART C

**Answer any six questions (not exceeding one page) Each carries three marks.**

11. Distinguish between Hire Purchase and Sale?
12. Write short notes on (a) stock and debtors system (b) Branch adjustment account (c) inter branch transactions.
13. Give the meaning of the terms (a) Royalty (b) Dead rent (c) Minimum Rent (d) Recouping of short workings
14. Briefly narrate the steps in converting single entry to double entry
15. The Assam coal company holds a lease of coal mines for a period of 10 years, commencing from 1.1.2000. According to the lease agreement the company is to pay ₹ 1.5 as royalty per ton with a minimum rent of ₹30,000 per year. Short workings can, however be recovered out of the royalty in excess of the minimum rent of the next two years only. In the year of strike, the minimum rent is to be reduced to 60%. The output for the 6 years has been as under: I year -10,000 units, II year 12,000 units, III year 28,000 units, Iv year 25,000 units, V year 50,000 units and VI year 15,000 units. Prepare the analysis table showing the amount paid as royalty for the 6 years.
16. From the following particulars prepare the necessary Adjustment accounts under self-balancing system

|       |                                   |     |       |
|-------|-----------------------------------|-----|-------|
| Jan 1 | Purchase Ledger balances          | Cr. | 30000 |
|       |                                   | Dr. | 750   |
| 31    | Purchase as per Purchase Day Book |     | 45000 |
|       | Returns as per Returns Day book   |     | 1000  |
|       | Cash paid as per Cash Book        |     | 43500 |

|                                |       |
|--------------------------------|-------|
| Cash received as per Cash Book | 250   |
| Discounts received             | 2000  |
| Discounts Allowed              | 650   |
| Bills Payable                  | 1250  |
| Transfer from Purchase Ledger  | 100   |
| Closing debit balance          | 500   |
| Cash purchases                 | 20000 |

17. Honda spares Chennai has a branch at Kottayam at which complete sets of books are kept. Give journal entries for the following in the HO books assuming that the books are closed on 31st December

- Goods valued at ₹35000 were transferred from HO on 28<sup>th</sup> December reached the branch only on 2<sup>nd</sup> January next year
- A remittance of ₹60000 made by branch to HO in December has not reached the HO till the closing date
- Depreciation of fixed assets of branch (accounts being maintained at HO) ₹18000
- Branch collected ₹6000 from HO customer at Kochi

18. The following are the figures relating to a departmental store:

|               | Dept. A<br>₹ | Dept. B<br>₹ | Dept. C<br>₹ |
|---------------|--------------|--------------|--------------|
| Opening stock | 6000         | 7000         | 3000         |
| Purchases     | 7000         | 6500         | 4700         |
| Sales         | 12000        | 10000        | 6000         |

Closing stock couldn't be valued but the normal gross profit rate for the departments concerned are 40%, 30% and 20% on turnover respectively.

The total indirect expenses of the departments were ₹2800 which is to be apportioned in the ratio of sales.

Prepare departmental Trading and P/L Account

[6 x 3 = 18]

### PART D

Answer any Two questions. Each carries eight marks.

19. From the following records kept on single entry basis, prepare final accounts for the year ending 31.12.2013

|              | Opening | Closing |
|--------------|---------|---------|
| Cash         | ?       | 5000    |
| Debtors      | 20000   | 30000   |
| Stock        | 10000   | 30000   |
| Fixed Assets | 50000   | 60000   |
| Creditors    | 15000   | 25000   |

Summary of the transactions during the year is :

|                            |       |       |
|----------------------------|-------|-------|
| (a) Total sales            | ..... | 30000 |
| (b) Cash purchases         | ..... | 12000 |
| (c) Drawings               | ..... | 8000  |
| (d) Cash paid for expenses | ..... | 15000 |

|                                     |                           |
|-------------------------------------|---------------------------|
| (e) Purchases of fixed assets ..... | 10000                     |
| (f) Credit sales .....              | Two- third of total sales |
| (g) Credit purchases .....          | 22000                     |
| (h) Fresh capital introduced .....  | 32000                     |

Adjustments to be made:

- (1) Depreciation on fixed assets at 10%. No depreciation to be charged on fixed assets purchases during the year
- (2) Prepaid expenses at the end amounted to ₹1000
- (3) Provide 5% for doubtful debts

**20.** From the following particulars relating to Bangalore branch for the year ending 31.12.2013, prepare branch A/C in the books of the HO to ascertain branch profit

**Ledger Balances as on 1.1.2013**

|                 |       |                        |       |                      |      |
|-----------------|-------|------------------------|-------|----------------------|------|
| Stock at branch | 40000 | Debtors at branch      | 14000 | Petty cash           | 1500 |
| Furniture       | 12000 | Prepaid fire insurance | 1150  | Salaries outstanding | 2100 |

Goods sent tot branch during the year

280000

Cash sales during the year

330000

Credit sales during the year

183000

Cash received from debtors

135000

Cash paid by debtors direct to HO

22000

Discount allowed to debtors

1100

Cash sent to branch for branch expenses: Rent 12000, Salaries 5400, Petty cash 4000, and Insurance for one year upto 31.3.2014 1600

Goods returned by branch to HO

4000

Goods returned by debtors

7000

Stock at branch on 31.12.2013

38000

petty cash paid by branch manager

2850

Provide depreciation on furniture at 10%

**21.** (a) Explain the methods of recording HP transactions in the books of the buyer and seller

(b) On 1<sup>st</sup> April 2013, Balan purchased from Warriar & Co., a machine on hire purchase basis. The hire purchase price ₹800000 is payable as follows.

₹200000 down payment and three annual instalments of ₹200000 each, the first annual instalment being payable on 31<sup>st</sup> March 2014. Interest charged by vendor is @5% per annum. Mr. Balan writes off depreciation @10% per annum on diminishing balance method.

Assuming that the cash price of the machine is ₹744600, prepare Machine A/C. Accounts are closed on 31<sup>st</sup> march.

[2 x 8 = 16]

**3B06 COM (CORE-VI OPTIONAL –A: CO-OPERATION-I)  
CO-OPERATIVE PRINCIPLES**

Time: 3 hours

Max. Marks: 40

**PART A**

**This part consists of FOUR questions carrying ½ marks each.  
Answer ALL questions in one word.**

1. Which was the first co-operative society established in the world?
2. Give the expansion of CAMPCO.
3. Which is the non official body of co-operative movement in Kerala?
4. In which year the NCDC was established? (1/2X4=2)

**PART B**

**Answer any FOUR questions in one or two sentences each.  
Each question carries ONE mark each.**

5. What are the main aims of Raiffiesen Society?
6. What is co-partnership?
7. What is co-operative commonwealth?
8. Who were Rochdale Pioneers?
9. What are pools?
10. What is NCUI? (1X4=4)

**PART C**

**Answer any SIX questions. Answer should not exceed one page each.  
Each question carries THREE marks each.**

11. Write short note on CRAFTCARD Report.
12. Explain the objectives and functions of ICA.
13. Explain the three tier system of credit.
14. Write a short note on CAPE.
15. Write a note on NABARD.
16. Explain the functions of NCCT.
17. What are the arguments for multipurpose societies?
18. State the objectives of co-operative education.

(3X6=18)

**PART D**

**Answer any TWO questions. Answer should not exceed FOUR pages each.**

**Each question carries EIGHT marks each.**

19. Explain the role of NABARD in providing rural credit.
20. Define co-operation. State the major principles of co-operation.
21. Give a brief account of co-operative movement in Japan.

(8X2=16)

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**3B06 COM (CORE - VI- OPTIONAL -B : COMPUTER APPLICATIONS-I)  
COMPUTER LANGUAGES AND SOFTWARES**

**Time :2 hours**

**Maximum Marks : 20**

**PART A**

**Answer all questions. Each carries ½ marks**

1. Key board is an example of -----unit
2. RAM stands for -----
3. COBOL is a -----language
4. Step by step procedure to solve problem is termed as -----

[4 x ½ = 2 ]

**PART B**

**Answer any two questions. Each carries one mark.**

5. Define computer
6. What is GUI?
7. What do you mean by Artificial Intelligence?

[ 2 x 1= 2]

**PART C**

**Answer any three questions (not exceeding one page) Each carries three marks.**

8. Explain the historical overview of computers
9. Enumerates about high level and low-level computer languages
10. What are the features of Power point?
11. What is software and what are the types of software?

(3 x 3 = 9)

**PART D**

**Answer any one questions. Each carries seven marks.**

12. Enumerates the features merits and demerits of computer.
13. Define software and what are the types of software's

(1 x 7 = 7)

### 3C04 COM (COMP. - IV) BUSINESS REGULATORY FRAMEWORK

Time : 3 hours

Maximum Marks : 40

#### PART- A

**Answer all questions. Each carries ½ Mark.**

1. All agreements are contracts if they are made by -----
2. The delivery of goods by one person to another for some specific purpose is called
3. ----- is the mercantile agent to whom possession of goods are given
4. An agreement with or by a minor is -----

4 x ½ =2)

#### PART – B

**Answer four questions. Each carries 1 mark**

5. Define quasi contract
6. What is contingent contract
7. What is meant by undue influence
8. Who is liable to perform contract
9. What do you mean by consideration
10. What is bailment

(4x1=4)

#### PART-C

**Answer any six questions. (Not exceeding one page) Each carries 3 marks.**

11. Distinguish sale and agreement to sell
12. Explain the remedies for breach of contract
13. Explain the essentials of sale of goods act
14. Explain the different ways of termination of contract of agency
15. Explain different types of guarantee
16. Explain the elements of contract
17. What are the circumstances in which an agreement becomes unlawful
18. Distinguish between condition and warranty

(6x3=18)

#### PART- D

**Answer any two questions. Each carries 8 marks.**

19. Define offer and explain the essential features of a valid offer
20. Discuss about the rights of a surety against creditors and the co-sureties
21. Explain the duties and rights of bailer and bailee

(2x8=16)

## 4A13COM (COMMON - XIII) ENTREPRENEURSHIP

**Time :3 hours**

**Maximum Marks : 40**

### PART A

**Answer all questions. Each carries ½ marks**

1. Knowledge + Skill + Traits = -----
2. MSME Act came into force on -----
3. KINFRA stands for
4. What is intrapreneur

[4 x ½ = 2 ]

### PART B

**Answer any four questions. Each carries one mark.**

5. Who is an entrepreneur
6. What is bridge capital
7. What is occupational mobility
8. What is motive
9. What is social marginality
10. What is KITCO

[ 4 x 1= 4]

### PART C

**Answer any six questions (not exceeding one page) Each carries three marks.**

11. What are the objectives of EDPs
12. Explain the functions of DICs
13. Explain the problems faced by the small units
14. Explain the economical factors affecting entrepreneurial growth
15. Explain the features of small scale industries
16. Explain about the entrepreneurial competency
17. Distinguish entrepreneur and intrapreneur
18. What are the external factors which motivate entrepreneurs

[6 x 3 = 18]

### PART D

**Answer any two questions. Each carries eight marks.**

19. Critically evaluate the role of entrepreneurship in economic development of a nation
20. Explain the hindrances in the field of entrepreneurship
21. Explain in detail about the phases of EDPs

[2 x 8 = 16]

## 4A14COM (COMMON - XIV) ENVIRONMENTAL STUDIES

**Time :3 hours**

**Maximum Marks : 40**

### PART A

**Answer all questions. Each carries ½ marks**

1. What is E waste
2. What is meant by deciduous forest
3. Ozone layer is present in-----
4. The study of soil is known as -----

[4 x ½ = 2 ]

### PART B

**Answer any four questions. Each carries one mark.**

5. What is NGO
6. What is EIA
7. What is green peace
8. What is biosphere
9. What is green revolution
10. What is silent valley

[ 4 x 1= 4]

### PART C

**Answer any six questions (not exceeding one page) Each carries three marks.**

11. Write note on air pollution
12. Explain the elements of ecology
13. How rivers in Kerala get polluted
14. Explain the functions of Pollution Control Board
15. Explain the causes and effects of depletion of Ozone layer
16. Explain the social obligations of business from the point of view of environment
17. Describe global warming
18. Explain different forms of land pollution

[6 x 3 = 18]

### PART D

**Answer any two questions. Each carries eight marks.**

19. Give an account of the water pollution in Kerala
20. Explain the cause and effects of land pollution
21. Explain the important provisions of Environment Protection Act

[2 x 8 = 16]

**4B07 COM (CORE - VII) INCOME TAX LAW & PRACTICE -I****Time :3 hours****Maximum Marks : 40****PART A****Answer all questions. Each carries ½ marks**

1. The highest authority of income tax is.....
2. HRA stands for -----
3. Any gain arising from the transfer of a long term capital asset is called .....
4. Rate of depreciation of intangible asset is equal to .....

[4 x ½ = 2 ]

**PART B****Answer any four questions. Each carries one mark.**

5. Define assessment year?
6. Define annual value?
7. What do you mean by perquisites?
8. What is meant by block of assets?
9. What is less tax commercial security?
10. What are capital assets?

[ 4 x 1= 4]

**PART C****Answer any six questions (not exceeding one page) Each carries three marks.**

11. How will you determine the residential status of an individual?
12. Name the perquisites taxable for all employees.
13. Define capital gain? What are the transactions that are regarded as transfer?
14. Mr. Roy, who is covered under Payment of Gratuity Act, received gratuity of Rs.800000 when he retired on 30-06-2012, after serving 34 years and 9 months. His average salary at the time of retirement was Rs.52000. What amount of gratuity is taxable for the Assessment Year 2013-14?
15. Mr.Ramesh has the following incomes for the previous year 2012-13.

|                                                              |         |
|--------------------------------------------------------------|---------|
| Income from House property in London                         | 30,000  |
| Income from salary in India for services rendered in London. | 48,000  |
| Profit from business in London controlled from India         | 90,000  |
| Profit from Kanpur business                                  | 100,000 |
| Agricultural Income in India                                 | 10,000  |
| Agricultural income from Germany                             | 20000   |

Compute total income if he is Resident

16. Mr.John a foreign national came to India for the first time on 15<sup>th</sup> June 2006. From 2006-07to 2011-12, he stayed in India for 125 days in each of the years and in 2012-13 he stayed for 75 days. Determine his residential status for the Assessment year 2013-14?.

17. Mr.A is the owner of a house property with a M.V of Rs.75000 and fair rent Rs.80000. The property is let out for a monthly rent of Rs.8000. Municipal tax paid amounted to Rs.5000, and due Rs.2500. Compute income from house property for the assessment year 2013-14, if the house remained vacant for 1 month?.
18. Compute income from other sources of Mr. Arun from particulars given below for the assessment year 2013-14:
- |                                                            |             |
|------------------------------------------------------------|-------------|
| (a) Interest(gross) on deposits with a company             | Rs. 10, 000 |
| (b) University remuneration for working as examiner        | Rs. 8, 000  |
| (c) Royalty for writing books                              | Rs. 80, 000 |
| He claims to have spent Rs. 20, 000 on writing these books |             |
| (d) Family pension received                                | Rs. 48, 000 |

[6 x 3 = 18]

**PART D****Answer any two questions. Each carries eight marks.**

19. Explain any ten items of income that are exempt from tax?
20. Mr. Rajiv furnished the following particulars of his income for the year 2012-13.

|                                               |                 |
|-----------------------------------------------|-----------------|
| Salary                                        | : Rs.20000 p.m. |
| Dearness Allowance                            | : Rs.1250 p.m.  |
| Entertainment Allowance                       | : 1000 p.m.     |
| Employer's and employee's contribution to RPF | : Rs.24000 each |
| Interest on PF @ 9.5% p.a.                    | : Rs.19000      |
| City Compensatory Allowance                   | : Rs.200 p.m.   |
| Medical allowance                             | : Rs.10000      |

He has been provided with an unfurnished accommodation (population less than 25 lakhs) for which the employee paid Rs.500 p.m. The house is owned by the employer. A sweeper @Rs.300 p.m. and a servant @ Rs.800 p.m. were provided by the employer. Compute taxable income under the head Salary for the A.Y.2013-14?

21. . The profit & loss account of a merchant for the year ended 31-03-2013 is given below:

**Profit & Loss account**

|                        |               |                  |               |
|------------------------|---------------|------------------|---------------|
| Office salary          | 4800          | Gross profit     | 135532        |
| General expenses       | 2550          | Commission       | 1205          |
| Bad debts              | 2100          | Sundry receipts  | 953           |
| Reserve for bad debts  | 3000          | Rent of building | 52640         |
| Fire insurance premium | 450           | Capital gain     | 3000          |
| Advertisement          | 2500          |                  |               |
| Interest on capital    | 1000          |                  |               |
| Interest on bank loan  | 1550          |                  |               |
| Donations              | 3875          |                  |               |
| Depreciation           | 1200          |                  |               |
| Net profit             | <u>170305</u> |                  |               |
|                        | <u>193330</u> |                  | <u>193330</u> |

Amount of depreciation allowable is Rs.1000. Compute business income.

[2 x 8 = 16]

## 4B08 COM (CORE – VIII): INFORMATICS SKILLS

**Time : 2 hours**

**Maximum Marks : 20**

### PART A

**Answer all questions. Each carries ½ marks**

1. ....is a spread sheet program.
2. ....is a temporary storage location in a computer
3. ....key combination is used to change Current Period in Tally
4. In computer Raw facts and figures are called -----

[4 x ½ = 2 ]

### PART B

**Answer any two questions. Each carries one mark.**

5. Define Hardware
6. what do you mean by “ Digital Divide”?
7. What do you mean by E-Mail?

[ 2 x 1= 2 ]

### PART C

**Answer any three questions (not exceeding one page) Each carries three marks.**

8. What are the uses of Excel Worksheet?
9. Differentiates between Ms Excel and Ms Word
10. What are the Uses of Page Maker ?
11. Explain Different forms of cyber crimes

[3 x 3 = 9]

### PART D

**Answer any one questions. Each carries seven marks.**

12. Explain the application of Information technology
13. Define Computer and what are its features uses and limitations?

[1 x 7 = 7]

**4B09 COM (CORE-IX OPTIONAL – A: CO-OPERATION-II)**  
**MANAGEMENT OF CO-OPERATIVES**

Time: 3 hours

Max. Marks: 40

**PART A**

**This part consists of FOUR questions carrying ½ marks each.  
 Answer ALL questions in one word.**

1. Which is the popular name of the Kerala State Co-operative Milk Marketing Federation?
2. Name the state in which KRIBHCO is situated?
3. At which level the central co-operative banks are organized in Kerala?
4. What does N P A stand for? (1/2X4=2)

**PART B**

**Answer any FOUR questions in one or two sentences each.  
 Each question carries ONE mark each.**

5. What is crop loan system?
6. What is kissan credit card?
7. What is meant by double compartment system?
8. State the main objective of NAFED?
9. What is industrial co-operative bank?
10. What is a supermarket? (1X4=4)

**PART C**

**Answer any SIX questions. Answer should not exceed one page each.  
 Each question carries THREE marks each.**

11. List the functions of primary agricultural credit societies.
12. Explain the causes of over dues in co-operative credit institutions.
13. Explain the different types of industrial co-operatives.
14. Write a short note on co-operative urban bank.
15. Write a note on MILMA.
16. Examine the need for co-operative processing societies.
17. Explain different types of housing societies.
18. State the objectives and functions of co-operative marketing.

(3X6=18)



**PART D**

**Answer any TWO questions. Answer should not exceed FOUR pages each.  
Each question carries EIGHT marks each.**

19. Explain the constitution and objectives of the Kerala State Co-operative Agricultural and Rural Development Bank Ltd. Also give the problems faced by the bank and suggestions for improvement.
20. Describe the membership, constitution, objectives and working of co-operative urban bank. Also explain the difficulties faced by them.
21. Discuss different types of housing societies. List the advantages and problems of housing co-operatives.

(8X2=16)

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**4B09 COM (CORE - IX OPTIONAL- B: COMPUTER APPLICATIONS-II )  
ELECTRONIC DATA PROCESSING & COMPUTER APPLICATION**

**Time : 2 hours**

**Maximum Marks : 20**

**PART A**

**Answer all questions. Each carries  $\frac{1}{2}$  marks**

1. Raw facts and figures are known as-----
2. EDP Stands for.....
3. The fundamental building blocks of computer circuits are called-----
4. DOS stands for.....

[4 x  $\frac{1}{2}$  = 2 ]

**PART B**

**Answer any two questions. Each carries one mark.**

5. Define Information
6. What is an Octal Number system?
7. How can you delete a folder from desk top?

[ 2 x 1= 2]

**PART C**

**Answer any three questions (not exceeding one page) Each carries three marks.**

8. Distinguish between data and Information
9. What are the advantages of EDP?
10. Write a short note on Linux software
11. What are the features of SPSS?

[3 x 3 = 9]

**PART D**

**Answer any one questions. Each carries seven marks.**

14. What is E- commerce ,what are the application of e-Commerce
15. What is software and what are the uses of software packages?

[1 x 7 = 7]

## 4C05 COM (COMP.- V) CORPORATE LAW & BUSINESS REGULATIONS

Time : 3 hours

Maximum Marks : 40

### PART- A

**Answer all questions. Each carries ½ Mark.**

1. The present Indian Companies Act came into force in
2. The prospectus of a company must be issued within ----- days of the date of registration
3. The companies act gives a model set of Articles of Association in -----
4. Who is a liquidator

4 x ½ =2)

### PART – B

**Answer four questions. Each carries 1 mark**

5. Define underwriting
6. What is qualification shares
7. What is voluntary winding up
8. What is meant by lifting corporate veil
9. What do you mean by minimum subscription
10. What is meant by motion

(4x1=4)

### PART-C

**Answer any six questions. (Not exceeding one page) Each carries 3 marks.**

11. List the functions of a company promoter
12. What are the important powers of a director
13. Describe the administrative authorities of a company law
14. Explain different types of company meeting
15. What is memorandum of association
16. Explain Table A
17. Explain the obligations on misstatement in prospectus
18. Explain about different modes of winding up

(6x3=18)

### PART- D

**Answer any two questions. Each carries 8 marks.**

19. What is the Articles of Association? Explain the contents of articles of association and how it differ from memorandum of association
20. Explain about different types of company meeting
21. Discuss the grounds for compulsory winding up. Explain the rights and duties of the liquidator

(2x8=16)

## 5B10 COM (CORE –X): COST ACCOUNTING

Time :3 hours

Maximum Marks : 40

### PART A

**I Answer all questions. Each carries ½ marks**

1. The value of benefit sacrificed in favour of an alternative course of action is known as .....
2. Carrying cost is also known as ..... cost
3. The guidance and regulation of cost of operating by an executive action is called .....
4. Costs which can be easily and clearly traced with a product is .....

[4 x ½ = 2 ]

### PART B

**II Answer any four questions. Each carries one mark.**

5. What is inter process profit?
6. What is ABC analysis?
7. What is Taylor's differential piece rate system?
8. What is scrap? How is treated?
9. What is operating costing?
10. What is classification of overhead?

[ 4 x 1= 4]

### PART C

**III Answer any six questions (not exceeding one page) Each carries three marks.**

11. "Cost accounting has become an essential tool of management" Give your comments on this statement
12. Explain the steps in purchasing?
13. Explain the advantages of time rate system of wage payment?
14. What are the causes of labour turn over?
15. From the following information in respect of a material, calculate the reorder level, average level, maximum and minimum level. ROQ 4000 units; delivery time 4-5 weeks; average rate of consumption/week 250 units maximum consumption in a week 300 units.
16. A workman's wages for a guaranteed 44 hours week is ₹50 per hour. The estimated time to produce one article is 30 minutes and under an incentive plan the time allowed is increased by 20%. During a week, a worker produced 100 articles calculate the wages under (a) Halsey plan and (b) Rowan plan
17. The manager of a concern consults you to fix a competitive price for his product. The following particulars are available from his past records. Production and sales for one month : **100 units,**

| Cost in ₹         |              |
|-------------------|--------------|
| Materials         | 3,900        |
| Wages             | 2,100        |
| Direct charges    | 300          |
| Works on cost     | 2,100        |
| Office on cost    | 840          |
| Selling overheads | 960          |
| Profit            | <u>1,500</u> |
| <b>Total cost</b> | <b>11700</b> |
|                   | =====        |

It is anticipated that during next year, he can sell 1500 units. It is estimated that cost of raw materials will increase by 20% and labour by 10%. 50% of the overheads are fixed. The selling expenses per unit

will be reduced by 20%. The rate of profit will remain the same. Prepare the cost sheet and fix the selling price.

18. Calculate machine hour rate from the following particulars

Cost of machine ₹500000  
 Estimated scrap value ₹12500  
 Estimated working life 15000 hours  
 Working hours per year 2000 hours  
 Cost of repairs per year ₹15000  
 Wages of operator per month ₹7500  
 Chemicals per month ₹1000  
 Overheads chargeable to this machine per month ₹2000  
 Power per hour 20 units at ₹ 1.4 per unit  
 No. of operators looking after 4 machines 2 persons

[6 x 3 = 18]

#### PART D

#### IV Answer any Two questions. Each carries eight marks.

19. Cochin chemicals Ltd. manufactures and sells chemicals produced by consecutive processes. The products of these processes are dealt with as under:

|                              | Process I | II    | III  |
|------------------------------|-----------|-------|------|
| Raw materials (Units)        | 1400      | 160   | 1260 |
| Rate per unit (Rs)           | 10        | 16    | 7    |
| Wages and other expenses(Rs) | 5152      | 3140  | 2898 |
| Transfer to next process     | 66.67%    | 33.33 | ---  |
| Transferred to warehouse     | 33.33%    | 40%   | 100% |

In each process 4% of the weight put in is lost and 6% is scrap which from process I realized Rs. 3 per unit, Rs. 5 per unit from Process II and Rs.13.50 per unit from process III. Prepare Process Accounts showing cost per unit of each process.

20. (a) What is overhead control? How is it effected in an organization?

(b) A company has four departments. The following are the expenses for the departments.

|              | ₹    |                     | ₹    |
|--------------|------|---------------------|------|
| Rent         | 1000 | Supervision         | 1500 |
| Repairs      | 600  | Insurance of plant  | 500  |
| Depreciation | 450  | Employees insurance | 150  |
| Light        | 100  | Power               | 900  |

The following further details are available

|                 | A      | B     | C     | D     |
|-----------------|--------|-------|-------|-------|
| Area (Sq.ft)    | 75     | 55    | 45    | 25    |
| Total wages (₹) | 4,000  | 3,000 | 2,000 | 1,000 |
| No of workers   | 12     | 08    | 06    | 04    |
| Value of Plant  | 12,000 | 9,000 | 6,000 | 3,000 |

Prepare a statement showing the apportionment of overheads to various departments and then

Re-apportion the overheads of service departments C in the ratio of number of workers and department D equally between A and B departments

21. Kerala constructions Ltd undertook a contract for 10,00,000 on 1.1.2013. The contract was completed on 31<sup>st</sup> December 2013. The details of the contract are:

|                           | ₹      |
|---------------------------|--------|
| Materials bought directly | 350000 |
| Materials from stores     | 70000  |
| Wages                     | 180000 |
| Direct expenses           | 70000  |
| Establishment charges     | 80000  |
| Plant                     | 342000 |
| Scrap sold                | 18200  |

Further information are as follows:

- (a) Accruals on 31<sup>st</sup> December 2013 were- wages ₹9000, direct expenses ₹12000
- (b) The cost of work uncertified include materials ₹26000, wages ₹1000 and expenses ₹15000
- (c) ₹20000 worth of plant and ₹30000 worth of materials were destroyed by fire at the end December
- (d) Depreciation on plant 10 %per annum
- (e) Materials at site ₹50000
- (f) Cash received from contractee ₹600000, being 80% of work certified.

Show contract account and items in the Balance sheet

[2 x 8 = 16]

## 5B11 COM (CORE –XI): CORPORATE ACCOUNTING

Time :3 hours

Maximum Marks : 40

### PART A

**I Answer all questions. Each carries ½ marks**

1. Excess of purchase consideration over the net asset value is debited to .....
2. On amalgamation by purchase, accumulated profits are transferred to .....A/C
3. Tax deducted at source on the dividend received is shown on the .... side of the B/S
4. In India, banking companies are governed by the Banking Regulations Act 1949 and should prepare its Final accounts as per ..... of the Act.

[4 x ½ = 2 ]

### PART B

**II Answer any four questions. Each carries one mark.**

5. Who is a liquidator?
6. What do you mean by profit and loss appropriation account?
7. Name the different methods of calculating purchase consideration?
8. What is Deficiency Account?
9. Give two examples of expenses chargeable to pre incorporation period only.
10. What is amalgamation?

[ 4 x 1= 4]

### PART C

**III Answer any six questions. (not exceeding one page) Each carries three marks.**

11. . Explain the methods of calculating purchase consideration on acquisition of a business by a company.
- 12.
13. What is amalgamation in the nature of merger?
14. Write short notes on (a) Non Performing Assets (b) Rebate on bills discounted (c) Statutory Reserve
15. On 1<sup>st</sup> January 2011, a company has a credit balance on its profit and loss account Rs500000 And net profit for the year ended 31.12.2011 was Rs1900000. During the year a half year's dividend was paid on Rs 50,00,000, 6 % preference shares. The directors now propose that the balance available is to be used for the following purposes:
  - a) To pay final dividend on pref. shares
  - b) To pay a dividend of 10 percent on Rs. 1 crore equity shares
  - c) To transfer Rs 5,00,000 to general reserve
  - d) To transfer Rs 2,50,000 to dividend equalization reserve
 Show P&L Appropriation account for the year ended 31<sup>st</sup> December 2011.

16. From the following data, compute the amount of provision to be made on the Profit and Loss account of PNB for the year ended 31.3.2014

|                                                                                           |              |
|-------------------------------------------------------------------------------------------|--------------|
| Standard assets                                                                           | 75,00,00,000 |
| Substandard assets                                                                        | 50,00,00,000 |
| Doubtful assets for one year (secured)                                                    | 20,00,00,000 |
| Doubtful assets for more than one year                                                    | 15,00,00,000 |
| Doubtful assets for more than 3 years<br>(Secured by mortgage of plant worth 3,50,00,000) | 6,00,00,000  |
| Loss assets                                                                               | 12,00,00,000 |

17. Anjali Ltd. Incorporated on 1-8-2007, acquired the running concern of Mr. Mohan with effect from 1-4-2007. Following details for the year ended 31-3-2008 are given below:

Gross profit – 270000;

Total sales for the year – 900000; Sales upto 31-7-2007 – 200000

Depreciation – 54000; Directors fee – 25000; Preliminary expense – 6000

Selling expense – 36000; Office expense – 46500; Salaries – 12000

Compute pre,post incorporation profit and loss.

18. From the following information, find out the discount to be credited to P/L A/C

Rebate on bills discounted on 1.1.2012, 3,24,800

Discount received during the year 10,80,000

An analysis of bills discounted showed the following on 31.12.2012 un matured bills

| Amount    | Rate of discount | Due date                    |
|-----------|------------------|-----------------------------|
| 7,30,000  | 12% pa           | 14 <sup>th</sup> March 2013 |
| 14,60,000 | 11% pa           | 19 <sup>th</sup> April 2013 |
| 43,80,000 | 10% pa           | 10 <sup>th</sup> May 2013   |

[6 x 3 = 18]

#### PART D

#### IV Answer any Two questions. Each carries eight marks.

19. Following is the TB of Amritha Trading Company as on 31.12.2013.

|                          |         |                                       |         |
|--------------------------|---------|---------------------------------------|---------|
| Discount Allowed         | 17000   | General reserve                       | 200000  |
| Salaries                 | 210000  | Equity share capital (shares of Rs10) | 800000  |
| Office expenses          | 186000  | 12% Pref.Shares (shares of Rs10)      | 600000  |
| Interest on secured loan | 24000   | 10% Debenture                         | 500000  |
| Stock on 1-1-2013        | 90000   | Sales                                 | 1800000 |
| Purchases                | 545000  | Purchase returns                      | 10000   |
| Sales returns            | 4000    | Sundry creditors                      | 320000  |
| Wages                    | 114000  | Bills payable                         | 100000  |
| Plant and Machinery      | 600000  | P&L Account                           | 10000   |
| Land & Buildings         | 300000  | Commission                            | 12000   |
| Furniture                | 50000   | Discount received                     | 8000    |
| Sundry debtors           | 320000  | Secured loans                         | 200000  |
| Bank                     | 230000  |                                       |         |
| 10%govt securities       | 1000000 |                                       |         |
| Goodwill                 | 870000  |                                       |         |
|                          | -----   |                                       | -----   |
|                          | 4560000 |                                       | 4560000 |
|                          | =====   |                                       | =====   |



## Additional information:

- a. The authorized capital of the company is Rs 2000000 consisting of 100000 equity shares and 100000 preference shares
- b. Stock on 31.12.2013 was valued at Rs.82000
- c. Provide D/P on L&B 10%, P&M 20%, Furniture 5%
- d. Interest on Govt. securities due for 6 months
- e. Provide for taxation Rs 260000
- f. Transfer Rs20000to general reserve ad Rs 30000 to dividend equalization reserve
- g. Directors proposed a dividend of 10% on equity shares.

Prepare final accounts of the company

20. The following is the summarized balance sheet of Pavithra Limited. As at 31.3.2013

|                                            |        |           |        |
|--------------------------------------------|--------|-----------|--------|
| Share capital<br>(40000 shares of 10 each) | 400000 | Furniture | 80000  |
| General Reserves                           | 180000 | Buildings | 200000 |
| P/L/ account                               | 60000  | Machinery | 100000 |
| 10% debentures                             | 200000 | Stock     | 40000  |
| Sundry creditors                           | 20000  | Debtors   | 60000  |
|                                            |        | Bank      | 300000 |
|                                            |        | Cash      | 80000  |
|                                            | -----  |           | -----  |
|                                            | 860000 |           | 860000 |
|                                            | =====  |           | =====  |

On April 1, 2013, Surya Limited took over the business of Pavithra Ltd. as per the following conditions:

1. Debentures are to be discharged at a premium of 5% in Surya Ltd.
2. Creditors are to be paid off by Surya Ltd.
3. Surya Ltd. Will issue 5 equity shares of 10 each at a market price of Rs. 11 for every 4 shares of Pavithra Ltd.
4. Cost of liquidation Rs.10000 is to be paid by Surya Ltd.

Close the books of Pavithra Ltd.(journal not required) and pass entries in the books of Surya Ltd. assuming that amalgamation is in the nature of purchase.

## 5B12COM (CORE- XII): AUDITING

**Time :3 hours**

**Maximum Marks : 40**

### PART A

**I Answer all questions. Each carries ½ marks**

1. The word Audit is derived from the Latin word .....
2. Statutory Audit is .....
3. A voucher is a ..... evidence to prove a transaction.
4. CAAT means ..... [4 x ½ = 2 ]

### PART B

**II Answer four questions. Each carries one mark.**

5. List out five advantages of auditing.
6. What is Internal Check?
7. Define Vouching.
8. What is Transmission of shares?
9. What is verification of assets?
10. What is EDP Audit?

[ 4 x 1= 4]

### PART C

**III Answer any six questions (not exceeding one page).Each carries three marks.**

11. Explain the advantages of Continuous Audit over final Audit .
12. What are Audit Working papers? What are its uses?
13. Explain the essentials of a valid voucher?
14. What are the disqualifications of an Auditor?
15. Write on the need for Audit of Partnership firms?
16. How does a casual vacancy of an Auditor arise? How is it filled up?
17. What is Civil Liability for Negligence of an Auditor?
18. Explain Audit Trails and Computer Assisted Auditing Techniques.

[6 x 3 = 18]

### PART D

**IV Answer any Two questions. Each carries eight marks.**

19. What are the objectives of Auditing? How does it differ from Investigation?
20. What is Audit Report? What are the different types of reports?
21. Explain the rights, duties and powers of a Company Auditor.

[2 x 8 = 16]

**5B13 COM (CORE - XIII) INCOME TAX LAW & PRACTICE -II****Time :3 hours****Maximum Marks : 40****PART A****Answer all questions. Each carries ½ marks**

1. Including the income of others into the income of the assessee is called.....
2. MAT stands for -----
3. Speculation loss can be set off from .....
4. Amount of deduction under section 80C is limited to .....

[4 x ½ = 2 ]

**PART B****Answer any four questions. Each carries one mark.**

5. What is meant by set off ?
6. Define domestic company ?
7. What do you mean by book profit ?
8. What is self assessment?
9. What is TDS?
10. What is advance payment of tax ?

[ 4 x 1= 4]

**PART C****Answer any six questions (not exceeding one page) Each carries three marks.**

11. How will you determine the allowable remuneration for partners in a firm?
12. Name the income tax authorities ?.
13. Mention the items from which tax is deducted at source?
14. Mr.Ramesh has the following incomes for the previous year 2012-13.

|                                                              |         |
|--------------------------------------------------------------|---------|
| Income from House property in London                         | 30,000  |
| Income from salary in India for services rendered in London. | 48,000  |
| Profit from business in London controlled from India         | 90,000  |
| Profit from Kanpur business                                  | 100,000 |
| Agricultural Income in India                                 | 10,000  |
| Agricultural income from Germany                             | 20000   |

Compute total income if he is Resident

15. Mr.John a foreign national came to India for the first time on 15<sup>th</sup> June 2006. From 2006-07 to 2011-12, he stayed in India for 125 days in each of the years and in 2012-13 he stayed for 75 days. Determine his residential status for the Assessment year 2013-14?.
16. Mr.A is the owner of a house property with a M.V of Rs.75000 and fair rent Rs.80000. The property is let out for a monthly rent of Rs.8000. Municipal tax paid amounted to Rs.5000, and due Rs.2500. Compute income from house property for the assessment year 2013-14, if the house remained vacant for 1 month?.
17. Compute income from other sources of Mr. Arun from particulars given below for the assessment year 2013-14:

|                                                            |             |
|------------------------------------------------------------|-------------|
| (e) Interest(gross) on deposits with a company             | Rs. 10, 000 |
| (f) University remuneration for working as examiner        | Rs. 8, 000  |
| (g) Royalty for writing books                              | Rs. 80, 000 |
| He claims to have spent Rs. 20, 000 on writing these books |             |
| (h) Family pension received                                | Rs. 48, 000 |

[6 x 3 = 18]

**PART D****Answer any two questions. Each carries eight marks.**

18. Explain any ten items of income that are exempt from tax?

19. Mr. Rajiv furnished the following particulars of his income for the year 2012-13.

|                                               |                 |
|-----------------------------------------------|-----------------|
| Salary                                        | : Rs.20000 p.m. |
| Dearness Allowance                            | : Rs.1250 p.m.  |
| Entertainment Allowance                       | : 1000 p.m.     |
| Employer's and employee's contribution to RPF | : Rs.24000 each |
| Interest on PF @ 9.5% p.a.                    | : Rs.19000      |
| City Compensatory Allowance                   | : Rs.200 p.m.   |
| Medical allowance                             | : Rs.10000      |

He has been provided with an unfurnished accommodation (population less than 25 lakhs) for which the employee paid Rs.500 p.m. The house is owned by the employer. A sweeper @Rs.300 p.m. and a servant @ Rs.800 p.m. were provided by the employer. Compute taxable income under the head Salary for the A.Y.2013-14?

20. The profit &amp; loss account of a merchant for the year ended 31-03-2013 is given below:

**Profit & Loss account**

|                        |               |                  |               |
|------------------------|---------------|------------------|---------------|
| Office salary          | 4800          | Gross profit     | 135532        |
| General expenses       | 2550          | Commission       | 1205          |
| Bad debts              | 2100          | Sundry receipts  | 953           |
| Reserve for bad debts  | 3000          | Rent of building | 52640         |
| Fire insurance premium | 450           | Capital gain     | 3000          |
| Advertisement          | 2500          |                  |               |
| Interest on capital    | 1000          |                  |               |
| Interest on bank loan  | 1550          |                  |               |
| Donations              | 3875          |                  |               |
| Depreciation           | 1200          |                  |               |
| Net profit             | <u>170305</u> |                  |               |
|                        | <u>193330</u> |                  | <u>193330</u> |

Amount of depreciation allowable is Rs.1000. Compute business income.

[2 x 8 = 16]

**5B14 COM (CORE-XIV OPTIONAL – A: CO-OPERATION-III)  
CO-OPERATIVE LAWS**

Time: 3 hours

Max. Marks: 40

**PART A**

**This part consists of FOUR questions carrying ½ marks each.  
Answer ALL questions in one word.**

1. In which year the co-operative legislation was enacted in India?
2. With whom the final authority in a co-operative society is vested?
3. Who is the chief executive officer of a co-operative society?
4. Which Act governs the co-operative societies in Kerala? (1/2X4=2)

**PART B**

**Answer any FOUR questions in one or two sentences each.  
Each question carries ONE mark each.**

5. Explain the main objects of 1904 Act.
6. Define a committee.
7. Who is an ordinary member?
8. What is the restriction on withdrawal of shares?
9. What is the term of office of the adhoc committee?
10. What are the essential requirements of meeting of a society? (1X4=4)

**PART C**

**Answer any SIX questions. Answer should not exceed one page each.  
Each question carries THREE marks each.**

11. Name the causes of slow growth of co-operative movement before independence?
12. What are the various functions of co-operative registrar?
13. Name the important provisions of Multi-State Co-operative Societies Act,2002.
14. What are the various circumstances of winding up of a society?
15. Distinguish between Co-operative Societies Act of 10904 and 1912.
16. Explain the circumstances of cancellation of registration certificate.
17. Mention the qualifications required for a person for being admitted as a member of a society.
18. What are the subject matter of bye laws of a society?

(3X6=18)

**PART D**

**Answer any TWO questions. Answer should not exceed FOUR pages each.**

**Each question carries EIGHT marks each.**

19. Examine the procedure relating to the registration of co-operative societies.
20. What are the rights and liabilities of members of co-operative societies?
21. Explain the features of the Kerala Co-operative Societies Act, 1969.

(8X2=16)

=====

**5B14 COM (CORE - XIV. OPTIONAL - B: COMPUTER APPLICATIONS-III)  
PROGRAMMING LANGUAGES**

**Time :2 hours**

**Maximum Marks : 20**

**PART A**

**Answer all questions. Each carries ½ marks**

1. The name of a Java Program file must match the name of the class with the extension.....
2. A Package is a collection of -----
3. The member function of a derived class can directly access the ..... data
4. The binding of data and functions together in to a single class-type variable is referred to as.....

[4 x ½ = 2 ]

**PART B**

**Answer any two questions. Each carries one mark.**

5. Define abstract class
6. What is polymorphism?
7. What do you mean by a control variable?

[ 2x 1= 2]

**PART C**

**Answer any three questions (not exceeding one page) Each carries three marks.**

8. Explain java constants
9. List the basic data types used in java.
10. Write the general form of switch statement.
11. Write the execution of the FOR statement

[6 x 3 = 18]

**PART D**

**Answer any one questions. Each carries seven marks.**

12. What is OOP? What are the basic concept of OOP?
13. Briefly explain the application of Internet and WWW in industry and commerce
14. Explain the characteristics merits of programming, briefly enumerate different types of programming

(1X7=7)

**5D01 COM(OPEN COURSE 1):BASIC ACCOUNTING****Time :2 hours****Maximum Marks : 30****PART A****I Answer all questions. Each carries ½ marks**

1. Trial balance checks .....
2. Sales journal records .....sale of goods.
3. Bank Account is ..... account.
4. ....is the principal book of account.

[4 x ½ = 2 ]

**PART B****II Answer four questions. Each carries one mark.**

5. Define Accounting.
6. What is business entity concept?
7. Distinguish between gross profit and net profit.
8. What do you mean by journal proper?
9. What are debit notes and credit notes?
10. What is do you mean by ledger?

[ 4 x 1= 4]

**PART C****III Answer any four questions (not exceeding one page) Each carries three marks.**

11. Explain (a) journal (b) journal entry (d) compound journal entry (e) narration.
12. What is an account? State the rules of debit and credit in case of real, personal and nominal account.
13. Briefly explain the different accounting concepts.
14. Enter the following transactions in proper subsidiary books.  
2013  
March 4 Bought of India Silk House, 500 metres of suitings @Rs 135; 200 metres of drill @Rs. 12.25; trade discount 10% in each case.  
10 Sold to T.William 40 metres curtain material @27.50  
11 Bought show case and counter for showroom from Universal supplies Ltd Rs. 14500  
12 Bought of Sri Ram Mills 300 metressuitings at @ Rs. 175 , less 25% trade discount; 250 metres rayon suitings @ Rs. 160, net.  
20 Sold to Bright Shop, 3000 metressuitings @ Rs. 200, net and 600 metres drill @ Rs. 22.75 less 5% trade discount.

**15. Prepare Mr. Das Account**

|                          |            |
|--------------------------|------------|
| Opening balance (Credit) | Rs. 10,000 |
| Purchase made from Das   | Rs.60,000  |
| Goods returned to Das    | Rs. 6,000  |
| Paid to Das by cheque    | Rs.40,000  |



16. From the following ledger balances prepare trial balance as on 31<sup>st</sup> March, 2013

|                 |        |                       |           |
|-----------------|--------|-----------------------|-----------|
| Purchases       | 82,000 | Sundry debtors        | 28,000    |
| Wages           | 7,200  | Bills Receivable      | 6,500     |
| Opening stock   | 15,000 | Carriage inwards      | 800       |
| Rates           | 750    | Bad debts             | 600       |
| Bills Payable   | 4,300  | Sales                 | 1, 30,000 |
| Commission (Cr) | 1,200  | Sundry creditors      | 23,800    |
| Rent(Cr)        | 3,600  | Capital               | 43,300    |
| Furniture       | 6,000  | Printing & Stationery | 650       |
| Land & Building | 48,000 | Discount allowed      | 580       |
| Cash in hand    | 920    | Salaries              | 9,200     |

17. Prepare trading account from the following.

|                   | Rs.    |
|-------------------|--------|
| Opening Stock     | 35000  |
| Sales             | 220000 |
| Purchases         | 133000 |
| Return inwards    | 10000  |
| Return outwards   | 3000   |
| Wages             | 10000  |
| Carriage inwards  | 6000   |
| Carriage outwards | 5000   |

Rate of gross profit on cost is 25%.

18. Rule a petty cash book with suitable analysis columns. The book is kept on the imprest system, the amount of the imprest being Rs. 150 for a week.

| 2006    |                                 | Rs.    |
|---------|---------------------------------|--------|
| March 1 | Petty cash in hand              | 7.50   |
| 1       | Received from cashier           | 142.50 |
| 1       | Postage stamps purchased        | 15.50  |
| 2       | Cost of registered letter       | 2.70   |
| 3       | Paid railway fares              | 13.40  |
| 4       | Paid for repairs to type writer | 17.00  |
| 5       | Paid for office cleaning        | 12.00  |
|         | Carriage on small parcels       | 8.50   |
| 6       | Paid for refreshment            | 13.75  |
|         | Envelopes purchased             | 6.25   |
| 7       | Postage on parcel               | 9.25   |
|         | Carriage on parcel              | 7.50   |
|         | Paid bus fare                   | 10.00  |
|         | Railway fare to manager         | 20.50  |

[4 x 3 = 12]

**PART D****IV Answer any Two questions. Each carries eight marks.**

19. From the following Trial Balance, prepare trading and profit and loss account for the year ended 31<sup>st</sup> March 2013 and a Balance Sheet as on that date.

Trial Balance as at 31<sup>st</sup> March 2013

| Particulars            | Debit<br>Rs.  | Credit<br>Rs. |
|------------------------|---------------|---------------|
| Capital                |               | 54000         |
| Stock(1-4-2012)        | 9500          |               |
| Machinery              | 18000         |               |
| Purchases              | 19500         |               |
| Sales                  |               | 30750         |
| Purchases Returns      |               | 630           |
| Sales returns          | 490           |               |
| Direct Wages           | 1100          |               |
| General Expenses       | 590           |               |
| Discount allowed       | 385           |               |
| Drawings               | 700           |               |
| Salaries               | 1100          |               |
| Carriage inwards       | 530           |               |
| Vehicles               | 14000         |               |
| Furniture              | 2400          |               |
| Sundry Creditors       |               | 4035          |
| Sundry Debtors         | 3950          |               |
| Cash in hand           | 540           |               |
| Cash at Bank           | 15340         |               |
| Insurance              | 850           |               |
| Commission<br>recieved | 850           | 410           |
| Rent                   |               |               |
|                        | <b>89,825</b> | <b>89,825</b> |

Adjustments:

1. Closing stock was valued Rs.10500
2. Wages outstanding Rs.350
3. Insurance prepaid Rs.50
4. Depreciate Machinery by 10%.

20. Record the following transactions in a cashbook.

| 2005    |                                                     | Rs.   |
|---------|-----------------------------------------------------|-------|
| April 1 | Cash in hand                                        | 35000 |
| 4       | Received from Anil (after allowing discount Rs.160) | 4200  |
| 5       | Paid into bank                                      | 14200 |
| 8       | Bought furniture by cash                            | 2500  |

|    |                                                        |      |
|----|--------------------------------------------------------|------|
| 12 | Paid cash to Paul (after discount Rs. 100)             | 2500 |
| 15 | Received cash from Basu (after discount Rs. 300)       | 4700 |
| 20 | Drew from bank                                         | 2000 |
| 22 | Goods purchased for cash                               | 1800 |
| 26 | Cash sales                                             | 4600 |
| 28 | Paid cash to Quader                                    | 5000 |
| 29 | Received cash from Chandran<br>(After discount Rs.200) | 3700 |
| 30 | Paid salaries                                          | 2400 |

21. Describe various subsidiary books.

[1x 12 = 12]

## 6B15 COM(CORE –XV): MANAGEMENT ACCOUNTING

Time :3 hours

Maximum Marks : 40

### PART A

**I Answer all questions. Each carries ½ marks**

1. Stock velocity indicates .....
2. Changing the Sales mix may result in improving .....
3. If equity is more compared to debentures and preference shares, the company is said to be on .....
4. A technique which uses standards for costs and revenues for the purpose of control is called .....

[4 x ½ = 2 ]

### PART B

**II Answer any four questions. Each carries one mark.**

5. Who are the users of financial statements?
6. What is trend analysis?
7. What do you mean by flexible budget?
8. What is an angle of incidence?
9. Define marginal costing
10. What is P/E ratio?

[ 4 x 1= 4]

### PART C

**III Answer any six questions (not exceeding one page) Each carries three marks.**

11. Explain the scope of management accounting
12. What is marginal costing? Point out the managerial uses of marginal costing.
13. Explain the procedure for effecting budgetary control in an organization.
14. Explain the important tools used for the interpretation and analysis of financial statements
15. Find out (a) BEP sales if budgeted output is 80000 units, fixed cost is ₹4,00,000, selling price per unit is ₹20 and variable cost per unit is ₹10  
(b) Calculate selling price if marginal cost is ₹2400, and P/V ratio is 20%  
(c) Margin of safety, if profit is ₹20,000 and P/V ratio is 40%
16. Using the following information, calculate labour variances. Gross direct wages ₹30,000, standard hours for production 1600, Actual hours paid 1500 hours.
17. From the following, fix the production priority. Pongal limited manufacturing 3 equipments using the same rawmaterial, the supply of which is limited. The information about the cost of 3 products are as under

A

B

C

|                                           |      |      |      |
|-------------------------------------------|------|------|------|
| Materials                                 | 250  | 300  | 150  |
| Labour                                    | 150  | 170  | 100  |
| Direct expenses                           | 30   | 30   | 20   |
| Variable overheads                        | 70   | 90   | 30   |
| Selling Price                             | 600  | 800  | 400  |
| Materials required per unit of production | 5 Kg | 6 Kg | 3 Kg |

18. Prepare comparative statement from the following

|                            | (Rupees in lakhs) |           |
|----------------------------|-------------------|-----------|
|                            | 2012              | 2013      |
| Sales                      | 676               | 818       |
| Cost of goods sold         | 440               | 495       |
| Gross Profit               | 236               | 323       |
| Operating expenses         | 199               | 262       |
| Operating profit           | 37                | 61        |
| Other incomes              | 3                 | 1         |
| Total income               | <b>40</b>         | <b>62</b> |
| Less expense including tax | 21                | 48        |
| Net Profit after tax       | <b>19</b>         | <b>14</b> |

[6 x 3 = 18]

#### PART D

IV Answer any Two questions. Each carries eight marks.

19. (a) Following is the income statement of REEBOK Ltd. For the year ended 31.12.2013

|                               |                               |                        |
|-------------------------------|-------------------------------|------------------------|
|                               |                               | ₹                      |
| Gross sales                   |                               | 32,00,000              |
| Less returns                  |                               | <u>2,00,000</u>        |
|                               |                               | 30,00,000              |
| Less cost of goods sold:      |                               |                        |
| Opening stock                 | 5,00,000                      |                        |
| Purchases                     | 20,00,000                     |                        |
| Less closing stock            | <u>7,00,000</u>               | <u>18,00,000</u>       |
| <b>Gross profit</b>           |                               | <b>12,00,000</b>       |
| Less operating expenses       |                               | <u>4,80,000</u>        |
| Operating profit              |                               | 7,20,000               |
| Less interest charges         |                               | <u>1,80,000</u>        |
| <b>Profit before taxation</b> |                               | <b>5,40,000</b>        |
|                               |                               | =====                  |
| Additional information:       |                               |                        |
| Current assets ₹9,75,000      | current liabilities ₹6,00,000 | Fixed Assets ₹5,25,000 |

Compute (a) Operating profit ratio (b) G.P ratio (c) NP ratio assuming 40% tax (d) ITR (e) Return on Capital employed (f) Current ratio

**(b) Also explain the significance of the above ratios**

**20.** Shankar limited presents you the following balance sheets for the year ended 31.12.2012 and 31.12.2013 and some additional information. Prepare cash flow statement

**Balance sheet**

|                        | 31.12.2012    | 31.12.2013    |                   | 31.12.2012    | 31.12.2013    |
|------------------------|---------------|---------------|-------------------|---------------|---------------|
| Share capital          | 100000        | 150000        | Fixed assets      | 80000         | 100000        |
| P/L Account            | 60000         | 80000         | Add additions     | <u>20000</u>  | <u>30000</u>  |
| Creditors              | 30000         | 25000         |                   | <b>100000</b> | <b>130000</b> |
| Provision for taxation | 20000         | 25000         | Less depreciation | <u>9000</u>   | <u>12000</u>  |
| Proposed dividend      | 10000         | 15000         |                   | <b>91000</b>  | <b>118000</b> |
|                        |               |               | Investments       | 4000          | 8000          |
|                        |               |               | Stock             | 80000         | 109000        |
|                        |               |               | Debtors           | 30000         | 40000         |
|                        |               |               | Cash              | 15000         | 20000         |
|                        | <u>220000</u> | <u>295000</u> |                   | <u>220000</u> | <u>295000</u> |
|                        | =====         | =====         |                   | =====         | =====         |

(a) Tax and dividend were paid Rs 22000 and Rs 12000 respectively during the year

(b) Profit for the year before charging depreciation amounted to Rs 67000

**21.** Prepare a cash budget of the three months ended 31th September 2013, based on the following information

Cash at bank on 1<sup>st</sup> July 2013 -- ₹25,000

Salaries and wages estimate (monthly) ---₹10,000

Interest payable (August 2013 ----₹5,000

| Details        | June     | July     | August   | September |
|----------------|----------|----------|----------|-----------|
| Cash sales     | -----    | 1,40,000 | 1,52,000 | 1,21,000  |
| Credit sales   | 1,00,000 | 80,000   | 1,40,000 | 1,20,000  |
| Purchases      | 1,60,000 | 1,70,000 | 2,40,000 | 1,80,000  |
| Other expenses | -----    | 20,000   | 22,000   | 21,000    |

Credit sales are collected 50 % in the month of sales made and the balance in the following month. Collections from credit sales are subject to 5% discount if payment is received during the month of purchase and 2.5% if payment is received in the month following. Creditors are paid either on a 'prompt' or 30 days basis. It is estimated that 10 % of the creditors are in the 'prompt' category.

[2 x 8 = 16]

## 6B16 COM (CORE-XVI) INTERNATIONAL BUSINESS

**Time :3 hours**

**Maximum Marks : 40**

### PART A

**Answer all questions. Each carries ½ marks**

1. EXIM bank was set up in -----
2. GSPS stands for -----
3. What is GATT
4. What is cross rate

[4 x ½ = 2 ]

### PART B

**Answer any four questions. Each carries one mark.**

5. Define EOU
6. What is balance of trade
7. Define foreign exchange risk
8. What is futures contract
9. What is global business
10. What is strategic partnership

[ 4 x 1= 4]

### PART C

**Answer any six questions (not exceeding one page) Each carries three marks.**

11. Explain LPG
12. Explain factor endowment theory
13. Explain WTO
14. Distinguish Tariff and non Tariff barriers to trade
15. State the theory of mercantilism
16. What is globalization
17. Explain import licensing producers
18. Explain new trade theory

[6 x 3 = 18]

### PART D

**Answer any two questions. Each carries eight marks.**

19. Explain the factors influencing the globalization
20. Which factors are stimulating foreign trade investment in India
21. Explain the role of international business in the economic development of the country

[2 x 8 = 16]

## 6B17 COM (CORE XVII) MODERN BANKING

**Time :3 hours**

**Maximum Marks : 40**

### PART A

**Answer all questions. Each carries ½ marks**

1. Current deposits are also known as .....
2. SWIFT stands for .....
3. RBI started its operations on.....
4. Pledge is connected with ..... property. [4 x ½ = 2 ]

### PART B

**Answer four questions. Each carries one mark.**

5. List out different types of loan.
6. What is a Smart Card?
7. Define Banker.
8. What is SLR?
9. Mention the circumstances in which a banker can close the customer's account.
10. Define bill of exchange. [ 4 x 1= 4]

### PART C

**Answer any six questions (not exceeding one page) Each carries three marks**

11. Explain the role of RBI in Industrial finance.
12. State the primary functions of commercial banks.
13. Explain different types of crossing.
14. What is virtual banking? State the advantages and limitations.
15. Explain the principles of sound lending.
16. Explain the steps in opening a bank account.
17. What are the need and importance of technology in banking?
18. Explain types of mortgage. [6 x 3 = 18]

### PART D

**Answer any Two questions. Each carries eight marks.**

19. Explain the special relationship between banker and customer.
20. What is credit creation? Explain its process and limitations.
21. Discuss the monetary functions of RBI. [2 x 8 = 16]



## 6B18 COM (CORE 18) FINANCIAL MARKETS & SERVICE

Time : 3 hours

Maximum Marks : 40

### PART- A

**Answer all questions. Each carries ½ Mark.**

1. The sensx consist of ----- stocks
2. Credit rating can be done by
3. ICICI was started in the year
4. Financial system comprises of

4 x ½ =2)

### PART – B

**Answer four questions. Each carries 1 mark**

5. Who is a factor
6. What is ADR
7. What is futures
8. What is derivatives
9. What is meant by listed securities
10. What is capital market

(4x1=4)

### PART-C

**Answer any six questions. (Not exceeding one page) Each carries 3 marks.**

11. Explain credit rating
12. Explain three promotional assistance by IDBI
13. Explain loan syndication
14. Discuss the functions of financial systems
15. Explain Zero coupon Bonds
16. Explain insider trading
17. Distinguish between capital market and money market
18. Explain the functions of credit cards

(6x3=18)

### PART- D

**Answer any two questions. Each carries 8 marks.**

19. Discuss the guidelines of SEBI on public issue
20. Explain the merits and problems of listing the securities
21. Critically evaluate the problems of Indian money market

(2x8=16)

**6B19 COM (CORE-XIX OPTIONAL – A: CO-OPERATION-IV)  
CO-OPERATIVE ACCOUNTING AND LEGISLATIONS**

Time: 3 hours

Max. Marks: 40

**PART A**

**This part consists of FOUR questions carrying ½ marks each.  
Answer ALL questions in one word.**

1. Which is the document containing the articles of agreement between the foreman and the subscribers of chitty?
2. What is the punishment for committing criminal breach of trust?
3. What is the name given to the intimation issued from complaint court to the defendant when a formal complaint has been filed against him with the court?
4. Which book is considered as the book of original entry in the case of a co-operative society or bank? (1/2X4=2)

**PART B**

**Answer any FOUR questions in one or two sentences each.  
Each question carries ONE mark each.**

5. Define dispute?
6. What is audit programme?
7. What is reserve fund?
8. What is injunction?
9. Define writ.
10. What is co-operative tribunal? (1X4=4)

**PART C**

**Answer any SIX questions. Answer should not exceed one page each.  
Each question carries THREE marks each.**

11. State the functions of state co-operative union.
12. With whom the responsibility for audit of co-operative societies is vested?
13. Explain the functions of the tribunal.
14. Explain how the profit of a society is distributed?
15. Briefly the procedure of audit classification.
16. Briefly explain the contents of variola.
17. Explain the contents of audit memorandum.
18. Briefly explain appeal, revision and review. (3X6=18)

**PART D**

**Answer any TWO questions. Answer should not exceed FOUR pages each.  
Each question carries EIGHT marks each.**

19. Briefly explain the various books and registers to be maintained by co-operative societies.  
20. What is summons? Explain the manner of service of summons on a defendant.  
21. Prepare a balance sheet from the following balances as on 30-03-2010 taken from the books of Mattanur Urban o-operative Bank Ltd.,

|                    |        |                        |        |
|--------------------|--------|------------------------|--------|
| Furniture          | 2,200  | honarium               | 500    |
| Admission fees     | 430    | stationery             | 450    |
| DCB share          | 5,500  | bank remittance        | 70,000 |
| Loan from DCB      | 50,000 | deposits received      | 15,000 |
| Share from members | 4,500  | interest from members  | 1,800  |
| Loan to members    | 4,500  | loan repaid to members | 8,600  |
| Bank withdrawals   | 60,500 | cash in hand           | 1,500  |
| Salaries           | 4,300  |                        |        |

**Adjustments:**

1. Salary outstanding Rs. 185.
2. Interest due from members Rs. 950.
3. Interest due to DCB Rs. 600.

(8X2=16)

=====

**6B19 COM (CORE – XIX) OPTIONAL - B: COMPUTER APPLICATIONS-IV)  
ACCOUNTING PACKAGES – TALLY**

**Time :2 hours**

**Maximum Marks : 20**

**PART A**

**Answer all questions. Each carries ½ marks**

- 1.The function key used to change current period is -----
2. There are ----- number of reserved groups in Tally
3. Profit and Loss A/c can be displayed through -----menu.
4. ----- is a pre defined ledger in Tally

[4 x ½ = 2 ]

**PART B**

**Answer any two questions. Each carries one mark.**

5. Define Account
6. What is double entry system?
7. Who is a Debtor?

[ 2x 1= 2]

**PART C**

**Answer any three questions (not exceeding one page) Each carries three marks.**

8. Explain the rule for Debit and Credit
9. List the components of Tally startup screen.
10. What are the information given in ledger creation?
- 11.How can you Alter and Delete Stock Category

[3x 3 = 9]

**PART D**

**Answer any one questions. Each carries seven marks.**

- 19.Enumerate the features of Tally. Also explain the technological advantages of Tally
- 20.List out the different types of vouchers used in Tally

[1 x 7 = 7]

**6B20 COM (CORE – XX) PROJECT REPORT**



**KANNUR UNIVERSITY**  
(Abstract)

*BSc Chemistry / Polymer Chemistry/Bio Chemistry - Revised Scheme & Syllabi of Core, Complementary and Open Courses under Choice Based Credit Semester System for Under Graduate Programme - implemented with effect from 2014 admission - Orders Issued.*

**ACADEMIC BRANCH**

No. Acad/C2/190/2014

Dated, Civil Station P.O, 28- 05-2014

Read: 1.U.O No. Acad/C2/2232/2014 dated 14-03-2014

2. Minutes of the meeting of the Board of Studies in Chemistry (UG) held on 01-01-2014.
3. Minutes of the meeting of the Faculty of Science held on 25-03-2014
4. Letter dated 29-03-2014 from the Chairman, BOS in Chemistry (UG).

**ORDER**

1. The Revised Regulations for UG Programmes under Choice based Credit Semester System were implemented in this University with effect from 2014 admission as per paper read (1) above.

2. As per paper read (2) above the Board of Studies in Chemistry finalized the Scheme, Syllabi & model Question Papers for Core, Complementary & open courses of BSc Chemistry/Polymer Chemistry/Bio Chemistry programmes to be implemented with effect from 2014 admission.

3. As per read (3) above the Faculty of Science held on 25-03-2014 approved Scheme, syllabi & model question papers for core/complementary & open courses of BSc Chemistry/Polymer Chemistry/Bio Chemistry programmes to be implemented with effect from 2014 admission.

4. The Chairman, Board of Studies in Chemistry (UG) vide paper read (4) above has submitted the finalized copy of Scheme, syllabi & Model question papers for core/complementary and open courses of BSc Chemistry/Polymer Chemistry/ Bio Chemistry programmes for implementation with effect from 2014 admission.

5. The Vice Chancellor, after examining the matter in detail, and in exercise of the powers of the Academic Council as per section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, has accorded sanction to implement the Revised scheme, syllabi & model question papers of BSc Chemistry/Polymer Chemistry/Bio Chemistry Programmes with effect from 2014 admission.

6. Orders, are therefore issued implementing the revised scheme, syllabi & model question papers for core, complementary & open courses of BSc Chemistry/Polymer Chemistry/Bio Chemistry programmes under CBCSS with effect from 2014 admission subject to report to Academic Council

7. Implemented revised Syllabi are appended.

SD/-  
DEPUTY REGISTRAR (ACADEMIC)

FOR REGISTRAR

To

1. The Principals of Affiliated Colleges offering B.Sc Chemistry/ Polymer Chemistry/ Bio Chemistry Programmes
2. The Examination Branch (through PA to CE)

Copy To:

1. The Chairman, BOS Chemistry (UG)
2. PS to VC/PA to PVC/PA to Registrar
3. DR/AR I Academic
4. Central Library
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Approved/By Order

  
Section Officer

❖ For more details log on to [www.kannur\\_university.ac.in](http://www.kannur_university.ac.in)





# **KANNUR UNIVERSITY**

***COURSE STRUCTURE***

***&***

***SYLLABUS***

***FOR***

***UNDERGRADUATE PROGRAMME***

***IN***

***CHEMISTRY***

***CORE & COMPLEMENTARY***

***COURSES***

***CHOICE BASED CREDIT SEMESTER SYSTEM***

***w.e.f 2014 ADMISSION***

# Curriculum

## Introduction

The B Sc degree programme in Chemistry aims to provide the students with an in-depth understanding of Chemical Sciences. The syllabus has been designed to stimulate the interest of the students in Chemistry and to equip them with a potential to contribute to the academic and industrial requirements of the society. The new updated syllabus is based on an interdisciplinary approach and is infused with a new vigour and depth. Chemistry being an experimental science, due importance is given to the development of laboratory and instrumentation skills.

The main objective is to provide to the students a deep understanding of the basic concepts of chemical sciences by acquiring the knowledge of terms, facts, concepts, processes, techniques and principles of the subject. It attempts to equip the students to cater to the industrial needs and to utilise them in the utmost practical manner.

The syllabus has been prepared after discussions with a number of faculty members in the subject and also after evaluating the existing syllabi of BSc, the new syllabi of XI & XII standards, the UGC model curriculum and syllabi of other Universities. The reference materials have been recommended after a thorough study. The revised course pattern, distribution of credits, scheme of evaluation and syllabus approved by the board are given below.

## BSc Chemistry Programme

The BSc programme in Chemistry is offered in six semesters within a period of three academic years. The programme shall include four types of courses, viz.,

- Common course -English & Additional language (Code A)
- Core course(Code B)
- Complementary course(Code C)
- Open course(Code D)

The Common and Complementary courses will be conducted during semester I to IV and the Core courses from semester I to VI. Open course will be during V semester.

## COURSE STRUCTURE FOR CHEMISTRY (UG) PROGRAMME

### 2014 ADMISSION

#### SEMESTER 1

| No. | Title of the Course                                          | Hours /week | Credit    | Marks     |            |            |
|-----|--------------------------------------------------------------|-------------|-----------|-----------|------------|------------|
|     |                                                              |             |           | IA        | ESE        | Total      |
| 1   | Common Course I English I                                    | 5           | 4         | 10        | 40         | 50         |
| 2   | Common Course 2 English II                                   | 4           | 3         | 10        | 40         | 50         |
| 3   | Common Course - Additional Language Course I                 | 4           | 4         | 10        | 40         | 50         |
| 4   | <b>Core Course 1 (Theoretical &amp; Inorganic Chemistry)</b> | 2           | 2         | 10        | 40         | 50         |
| 5   | Core Course 2, Practical I                                   | 2           | -         | -         | -          | -          |
| 6   | Complementary 1 (Course I)                                   | 2           | 2         | 8         | 32         | 40         |
| 7   | Complementary 1 Practical                                    | 2           | -         | -         | -          | -          |
| 8   | Complementary 2 (Course I)                                   | 4           | 3         | 10        | 40         | 50         |
|     | <b>Total</b>                                                 | <b>25</b>   | <b>18</b> | <b>58</b> | <b>232</b> | <b>290</b> |

#### SEMESTER 2

| No. | Title of the Course                           | Hours /week | Credit    | Marks     |            |            |
|-----|-----------------------------------------------|-------------|-----------|-----------|------------|------------|
|     |                                               |             |           | IA        | ESE        | Total      |
| 1   | Common Course 3 English III                   | 5           | 4         | 10        | 40         | 50         |
| 2   | Common Course 4 English IV                    | 4           | 3         | 10        | 40         | 50         |
| 3   | Common Course - Additional Language Course II | 4           | 4         | 10        | 40         | 50         |
| 4   | <b>Core Course 3 (Analytical Chemistry)</b>   | 2           | 2         | 10        | 40         | 50         |
| 5   | Core Course 2, Practical I, Part II           | 2           | 3         | 10        | 40         | 50         |
| 6   | Complementary 1 (Course II)                   | 2           | 2         | 8         | 32         | 40         |
| 7   | Complementary 1 (Course II) Practical         | 2           | -         | -         | -          | -          |
| 8   | Complementary 2 (Course II)                   | 4           | 3         | 10        | 40         | 50         |
|     | <b>Total</b>                                  | <b>25</b>   | <b>21</b> | <b>68</b> | <b>272</b> | <b>340</b> |

**SEMESTER 3**

| No. | Title of the Course                            | Hours /week | Credit    | Marks     |            |            |
|-----|------------------------------------------------|-------------|-----------|-----------|------------|------------|
|     |                                                |             |           | IA        | ESE        | Total      |
| 1   | Common Course 5 English V                      | 5           | 4         | 10        | 40         | 50         |
| 2   | Common Course - Additional Language Course III | 5           | 4         | 10        | 40         | 50         |
| 3   | <b>Core Course 4 (Organic Chemistry-I)</b>     | 3           | 3         | 10        | 40         | 50         |
| 4   | Core Course 5, Practical 2,Part I              | 2           | -         | -         | -          | -          |
| 5   | Complementary 1 (Course III)                   | 3           | 2         | 8         | 32         | 40         |
| 6   | Complementary 1 (Course III) Practical         | 2           | -         | -         | -          | -          |
| 7   | Complementary 2 (Course III)                   | 5           | 3         | 10        | 40         | 50         |
|     | <b>Total</b>                                   | <b>25</b>   | <b>16</b> | <b>48</b> | <b>192</b> | <b>240</b> |

**SEMESTER 4**

| No. | Title of the Course                           | Hours /week | Credit    | Marks     |            |            |
|-----|-----------------------------------------------|-------------|-----------|-----------|------------|------------|
|     |                                               |             |           | IA        | ESE        | Total      |
| 1   | Common Course 6 English VI                    | 5           | 4         | 10        | 40         | 50         |
| 2   | Common Course - Additional Language Course IV | 5           | 4         | 10        | 40         | 50         |
| 3   | <b>Core Course 6 (Organic Chemistry -II)</b>  | 3           | 3         | 10        | 40         | 50         |
| 4   | Core Course 5, Practical 2,Part II            | 2           | 3         | 10        | 40         | 50         |
| 5   | Complementary 1 (Course IV)                   | 3           | 2         | 8         | 32         | 40         |
| 6   | Complementary 1 (Course IV) Practical         | 2           | 4         | 8         | 32         | 40         |
| 7   | Complementary 2 (Course IV)                   | 5           | 3         | 10        | 40         | 50         |
|     | <b>Total</b>                                  | <b>25</b>   | <b>23</b> | <b>66</b> | <b>264</b> | <b>330</b> |

**SEMESTER 5**

| No. | Title of the Course                     | Hours /week | Credit    | Marks     |            |            |
|-----|-----------------------------------------|-------------|-----------|-----------|------------|------------|
|     |                                         |             |           | IA        | ESE        | Total      |
| 1   | Open Course                             | 2           | 2         | 5         | 20         | 25         |
| 2   | Core Course 7 (Inorganic Chemistry -I)  | 3           | 4         | 10        | 40         | 50         |
| 3   | Core Course 8 (Inorganic Chemistry-II)  | 3           | 4         | 10        | 40         | 50         |
| 4   | Core Course 9 (Physical Chemistry-I)    | 3           | 4         | 10        | 40         | 50         |
| 5   | Core Course 10 (Physical Chemistry-II)  | 3           | 4         | 10        | 40         | 50         |
| 7   | Core Course 11,Practical 3              | 5           | -         | -         | -          | -          |
| 8   | Core Course 12, Practical 4             | 5           | -         | -         | -          | -          |
| 9   | Core Course 13 Project/Industrial Visit | 1           | -         | -         | -          | -          |
|     | <b>Total</b>                            | <b>25</b>   | <b>18</b> | <b>45</b> | <b>180</b> | <b>225</b> |

## SEMESTER 6

| No.          | Title of the Course                            | Hours /week | Credit    | Marks     |            |            |
|--------------|------------------------------------------------|-------------|-----------|-----------|------------|------------|
|              |                                                |             |           | IA        | ESE        | Total      |
| 1            | Core Course 14 (Organic Chemistry-III)         | 4           | 4         | 10        | 40         | 50         |
| 2            | Core Course 15 (Physical Chemistry-III)        | 3           | 3         | 10        | 40         | 50         |
| 3            | Core Course 16 (Physical methods In Chemistry) | 3           | 3         | 10        | 40         | 50         |
| 4            | Core Course 17(Elective)                       | 3           | 3         | 10        | 40         | 50         |
| 5            | Core Course 18, Practical 5                    | 3           | 3         | 10        | 40         | 50         |
| 6            | Core Course 11& 12 Practical 3& 4              | 7           | 6         | 10+       | 40+        | 50+        |
|              |                                                |             |           | 10        | 40         | 50         |
| 7            | Core Course 13 Project Industrial Visit        | 2           | 2         | 4         | 16+        | 25         |
|              |                                                |             |           | 5         |            |            |
| <b>Total</b> |                                                | <b>25</b>   | <b>24</b> | <b>74</b> | <b>301</b> | <b>375</b> |

**Total Credit**

**120**

**Total Marks**

**1800**

## Scheme of Mark distribution - B Sc Chemistry Programme

| Course                           | No.of Papers              | Marks per paper | Total Marks |
|----------------------------------|---------------------------|-----------------|-------------|
| Common Course-English            | 6                         | 50              | 300         |
| Common Course-Addl.language      | 4                         | 50              | 200         |
| Complimentary Course-Physics     | 5(4 Theory +1Practical)   | 40              | 200         |
| Complimentary Course-Mathematics | 4                         | 50              | 200         |
| Core Course-Chemistry            | 17(12Theory +5Practicals) | 50              | 850         |
| Project                          | 1                         | 25              | 25          |
| Open Course                      | 1                         | 25              | 25          |

## Credit distribution - B Sc Chemistry programme (Semester I to VI)

| Programme          | Sem.  | Common* |       | Core Chemistry  | Complementary |         | Open | Total |
|--------------------|-------|---------|-------|-----------------|---------------|---------|------|-------|
|                    |       | Eng     | Addl. |                 | Maths         | Physics |      |       |
| BSc<br>(Chemistry) | I     | 4+3     | 4     | 2               | 3             | 2       |      | 18    |
|                    | II    | 4+3     | 4     | 2+3             | 3             | 2       |      | 21    |
|                    | III   | 4       | 4     | 3               | 3             | 2       |      | 16    |
|                    | IV    | 4       | 4     | 3+3             | 3             | 2+4     |      | 23    |
|                    | V     |         |       | 4+4+4+4         |               |         | 2    | 18    |
|                    | VI    |         |       | 4+3+3+3+3+3+3+2 |               |         |      | 24    |
|                    | Total |         | 22    | 16              | 56            | 12      | 12   | 2     |

## Components of Core (Chemistry)

The core courses of BSc Chemistry programme will consist of the following components.

- Theory
- Practical
- Project (Investigatory)
- Study tour (Visiting Factory/ science institute/laboratory).

### Scheme of Core course (Chemistry)

| No. | Semester | Course code       | Title of the Course                                      | Credits | Contact hr/week         |
|-----|----------|-------------------|----------------------------------------------------------|---------|-------------------------|
| 1   | I        | 1B01CHE           | Theoretical and Inorganic Chemistry                      | 2       | 2                       |
| 2   | II       | 2B03CHE           | Analytical Chemistry                                     | 2       | 2                       |
| 3   | II       | 1B02CHE & 2B02CHE | *Core Course Practical I Volumetric Analysis             | 3       | 2—I Sem<br>2—II Sem     |
| 4   | III      | 3B04CHE           | Organic Chemistry-I                                      | 3       | 3                       |
| 5   | IV       | 4B06CHE           | Organic Chemistry-II                                     | 3       | 3                       |
| 6   | IV       | 3B05CHE & 4B05CHE | *Core Course Practicals 2 Inorganic Qualitative Analysis | 3       | 2—III Sem<br>2—IV Sem   |
| 7   | V        | 5B07CHE           | Inorganic Chemistry-I                                    | 4       | 3                       |
| 8   | V        | 5B08CHE           | Inorganic Chemistry-II                                   | 4       | 3                       |
| 9   | V        | 5B09CHE           | Physical Chemistry- I                                    | 4       | 3                       |
| 10  | V        | 5B10CHE           | Physical Chemistry- II                                   | 4       | 3                       |
| 11  | VI       | 6B14CHE           | Organic Chemistry III                                    | 4       | 4                       |
| 12  | VI       | 6B15CHE           | Physical Chemistry III                                   | 3       | 4                       |
| 13  | VI       | 6B16CHE           | Physical Methods in Chemistry                            | 3       | 3                       |
| 14  | VI       | 6B17CHE           | Elective                                                 | 3       | 3                       |
| 15  | VI       | 5B11CHE & 6B11CHE | *Core Course Practicals 3 Gravimetric Analysis           | 3       | 5—V Sem<br>2—VI Sem     |
| 16  | VI       | 5B12CHE & 6B12CHE | *Core Course Practicals 4 Organic Chemistry              | 3       | 5---V Sem<br>3---VI Sem |
| 17  | VI       | 6B18CHE           | *Core Course Practicals5 Physical Chemistry              | 3       | 5                       |
| 18  | VI       | 5B13CHE & 6B13CHE | Project & Industrial Visit                               | 2       | 1—Sem V<br>1---Sem VI   |

\* External examination will be held at the end of II/ IV/VI semester

### Scheme for Core Elective Course

| No | Semester | Course code | Title of the course     | Contact hour/Week | Credit |
|----|----------|-------------|-------------------------|-------------------|--------|
| 1  | VI       | 6B17CHE-A   | Environmental Chemistry | 3                 | 3      |
| 2  | VI       | 6B17CHE-B   | Applied Chemistry       | 3                 | 3      |
| 3  | VI       | 6B17CHE-C   | Polymer Chemistry       | 3                 | 3      |
| 4  | VI       | 6B17CHE-D   | NanoChemistry           | 3                 | 3      |

### Scheme--- Complementary Course ( Chemistry)

| No | Semester        | Course code | Title of the course                               | Contact hour/week | Credit |
|----|-----------------|-------------|---------------------------------------------------|-------------------|--------|
| 1  | I               | 1C01CHE     | Chemistry<br>(For Physical & Biological Sciences) | 2                 | 2      |
| 2  | II              | 2C02CHE     | Chemistry<br>(For Physical & Biological Sciences) | 2                 | 2      |
| 3  | III             | 3C03CHE(BS) | Chemistry (For Biological Science)                | 3                 | 2      |
| 4  | III             | 3C03CHE(PS) | Chemistry (For Physical Science)                  | 3                 | 2      |
| 5  | IV              | 4C04CHE(BS) | Chemistry (For Biological Science)                | 3                 | 2      |
| 6  | IV              | 4C04CHE(PS) | Chemistry (For Physical Science)                  | 3                 | 2      |
| 5  | I,II,<br>III&IV | 4C05CHE*    | Complementary Chemistry<br>practical              | 2                 | 4      |

\* External examination will be conducted at the end of IV semester.

## Scheme of Open course

The open course is meant for all the students in the institution except the students of BSc Chemistry programme. External examination will be conducted at the end of V<sup>th</sup> semester.

### Options available for Open course (Chemistry)

| No | Semester | Course code | Title of the course         | Contact hour/ week | Credit |
|----|----------|-------------|-----------------------------|--------------------|--------|
| 1  | V        | 5D01CHE     | Chemistry in Service to man | 2                  | 2      |
| 2  | V        | 5D02CHE     | Drugs-Use & Abuse           | 2                  | 2      |
| 3  | V        | 5D03CHE     | Environmental Studies       | 2                  | 2      |
| 4  | V        | 5D04CHE     | Nanomaterials               | 2                  | 2      |

### Evaluation pattern

Mark system will be followed instead of direct grading for each question. For each course in the semester letter grade, grade point and % of marks are introduced in 7-point indirect grading system as per KUCBCSSUG 2014. Accordingly 20% of the total marks in each course are for internal evaluation and the remaining 80% for external evaluation.

#### Internal Evaluation (Core , Complementary & Open )

Components with percentage of marks of Internal Evaluation of Theory

- Attendance-25%
- Test papers-50%
- Assignment/ Seminar/Viva-25%

Internal evaluation is conducted by the concerned Department in mark system. Marks secured for internal evaluation need be send to University.

#### External Evaluation (Core , Complementary & Open )

External assessment will include Theory, Practical and Project evaluation conducted by University after the completion of a semester. Duration of theory examination for Core & Complementary courses will be 3 hours, where as for Open course is 2 hours. The practical examination for Core & Complementary will be of 4 hour duration.

#### Project work:

Project works will be carried out in fifth and sixth semesters. Not more than five students can form a group and undertake a project. Each individual student should submit a copy of the project report duly attested by the supervising teacher and Head of the



department. The report has to be presented at the time of practical examination conducted at the end of VI semester for evaluation.

**Study tour:**

**Students are required to visit a factory/Laboratory/Research Institute of repute during the course** and have to submit the report of the study tour at the end of the sixth semester during the time of practical examination. No credit will be separately given for study tour report.

Practical record, Project report & Study tour report must be certified by the teacher in charge and countersigned by the Head of the Department. Students should submit certified record of respective practical work at the time of University practical examination.

**Mark distributions**

Table 1: Internal and External marks for Core (Chemistry) courses:

| Item             | Marks    |          | Total |
|------------------|----------|----------|-------|
|                  | Internal | External |       |
| Theory           | 10       | 40       | 50    |
| Practical        | 10       | 40       | 50    |
| Industrial visit | --       | 5        | 5     |
| Project          | 4        | 16       | 20    |

Table 2: Internal and External marks for Complementary (Chemistry)

| Item      | Marks    |          | Total |
|-----------|----------|----------|-------|
|           | Internal | External |       |
| Theory    | 8        | 32       | 40    |
| Practical | 8        | 32       | 40    |

Table 3: Internal and External marks for Open Course (Chemistry)

| Item   | Marks    |          | Total |
|--------|----------|----------|-------|
|        | Internal | External |       |
| Theory | 5        | 20       | 25    |

Table 4: Distribution of Internal marks for Theory courses (Core, Complementary & Open).

|                          |     |
|--------------------------|-----|
| Attendance               | 25% |
| Assignment /Seminar/Viva | 25% |
| *Test paper              | 50% |

\* At least two test papers are to be conducted and average of these two is to be taken for awarding mark.

Table 5: Distribution of Internal marks for Practical courses

|                           |     |
|---------------------------|-----|
| Attendance                | 25% |
| Record + Lab involvement* | 50% |
| Test papers               | 25% |

\*On completion of each experiment, a report should be presented to the course teacher. It should be recorded in a bound note-book. The experimental description should include aim, principle, materials/apparatus required/used, method/procedures, and tables of data collected, equations, calculations, graphs, and other diagrams etc. as necessary and final results.

Table 6: Distribution of internal and external marks for Project

| Internal (20% of Total)           | %    | External (80 % of total)                                   | %    |
|-----------------------------------|------|------------------------------------------------------------|------|
| Punctuality                       | 20 % | Relevance of Topic/Statement of Objectives and Methodology | 20%  |
| Use of data                       | 20%  | Presentation/Quality of analysis and findings              | 30 % |
| Scheme and Organization of report | 30%  | Viva Voce                                                  | 50%  |
| Viva Voce                         | 30 % |                                                            |      |

#### Criteria for awarding marks for Attendance:

Table 7: Distribution of marks for attendance

| Attendance % | Marks% |
|--------------|--------|
| Above 90%    | 100%   |
| 85 to 89%    | 80%    |
| 80 to 84%    | 60%    |
| 76 to 79%    | 40%    |
| 75%          | 20%    |

#### Grading of students

Internal marks alone need to be sent to the University. External examination will be conducted and assessed by the University using mark system. The semester wise performance called SGPA (Semester Grade Point Average) and overall performance on completion of the programme called CGPA (Cumulative Grade Point Average) of a student will be made by the University by taking the marks of internal and external assessments using a 7 Point Indirect Grading System as per KUCBCSSUG 2014. Finally an overall letter grade (called Cumulative Grade) for the entire programme will be awarded by the University. For the detailed calculations of SGPA, CGPA & Overall letter grade readers are directed to refer KUCBCSSUG 2014.

Table 8: Seven Point Indirect Grading System.

| Marks        | Grade | Interpretation | Grade point average | Range of grade | Class                        |
|--------------|-------|----------------|---------------------|----------------|------------------------------|
| 90 and above | A+    | Outstanding    | 6                   | 5.5 - 6        | First class with distinction |
| 80 to 89     | A     | Excellent      | 5                   | 4.5 - 5.49     |                              |
| 70 to 79     | B     | Very good      | 4                   | 3.5 - 4.49     | First class                  |
| 60 to 69     | C     | Good           | 3                   | 2.5 - 3.49     |                              |
| 50-59        | D     | Satisfactory   | 2                   | 1.5 - 2.49     | Second class                 |
| 40-49        | E     | Adequate       | 1                   | 0.5 - 1.49     | Pass                         |
| Below 40     | F     | Failure        | 0                   | 0.0 - 0.49     | Fail                         |

**Distribution of Marks & type of questions for Core (Chemistry), Complementary (Chemistry) & Open (Chemistry) courses.**

Table 9. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

Table 10. Type of Questions & Marks for External Examination- Complementary Chemistry

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                      | 5           |
| Short answer         | 6               | 4                               | 2                      | 8           |
| Short essay/Problems | 5               | 3                               | 3                      | 9           |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 20              | 14                              |                        | 32          |

Table 11. Type of Questions & Marks for External Examination - Open Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Marks for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|---------------------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                                     | 5           |
| Short answer         | 5               | 3                               | 2                                     | 6           |
| Short essay/Problems | 5               | 3                               | 3                                     | 9           |
| Total                | 15              | 11                              |                                       | 20          |

**Distribution of marks for the practical examination:**

The distribution of marks will be decided by the concerned Board of Examinations.

**ANNEXURE I**

**Guidelines for the Evaluation of Projects**

1. Evaluation of the Project Report shall be done under Mark System.
2. The evaluation of the project will be done at two stages:
  - a) Internal Assessment (supervising teachers will assess the project and award internal Marks)
  - b) External evaluation (external examiner appointed by the University)
  - c) Marks secured for the project will be awarded to candidates, combining the internal and external Marks

3. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

| Internal(20% of total)        |                     | External( 80% of Total)                                                                  |                     |
|-------------------------------|---------------------|------------------------------------------------------------------------------------------|---------------------|
| Components                    | % of internal Marks | Components                                                                               | % of external Marks |
| Punctuality                   | 20                  | Relevance of the Topic, Statement of Objectives, Methodology (Reference/ Bibliography)   | 20                  |
| Use of Data                   | 20                  | Presentation, Quality of Analysis/Use of Statistical tools, Findings and recommendations | 30                  |
| Scheme/Organization of Report | 30                  | Viva-Voce                                                                                | 50                  |
| Viva-Voce                     | 30                  |                                                                                          |                     |

4. Internal Assessment should be completed 2 weeks before the last working day of VI<sup>th</sup> semester.
5. Internal Assessment marks should be published in the department.
8. Project evaluation shall be done in the VI semester along with practical exams.
9. Chairman Board of Examinations, may at his discretion, on urgent requirements, make certain exception in the guidelines for the smooth conduct of the evaluation of project.

**2. PASS CONDITIONS-**

1. Submission of the Project Report and presence of the student for viva are compulsory for internal evaluation. No marks shall be awarded to a candidate if she/he fails to submit the Project Report for external evaluation.
2. The student should get a minimum of 40 % marks for pass in the project.
3. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re- done and the report may be re-submitted along with subsequent exams through parent department.

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# **SYLLABUS**

## Semester-1

### 1B01CHE :THEORETICAL AND INORGANIC CHEMISTRY

**Credit-2**

**Contact hours-36**

#### **UNIT 1. EVALUATION OF ANALYTICAL DATA (9hrs.)**

Terms used in evaluation of analytical data – significant figures – Rounding of the numerical expression – Errors – Precision and accuracy – Ways of expressing precisions – Ways to reduce systematic errors - Average deviation from the mean - Standard Deviation – Relative standard deviation – Reporting of analytical data- Statistical treatment of analytical data – Population and samples – Confidence limit- Test of significance – students t-test, f-test.

#### **UNIT 2. WAVE MECHANICAL CONCEPT OF ATOMIC STRUCTURE (9 hrs.)**

Bohr model of hydrogen atom – Bohr's equation for the energy of electron in hydrogen atom – Limitations of Bohr theory- Hydrogen spectrum – Classical mechanics – concept, failure. Black body radiation- Planck's law of radiation. Photoelectric effect- Heisenberg's uncertainty principle and its significance, dual nature of electrons – Davisson and Germer's experiment. - de Broglie hypothesis - Schrodinger wave equation ( derivation not expected), significance of  $\psi$  and  $\psi^2$  - Nodal planes in atomic orbitals - Postulates of quantum mechanics. Quantum numbers - Shapes of orbitals - Aufbau, Pauli's and Hund's rule - Electronic configuration of atoms.

#### **UNIT 3. CHEMICAL BONDING (9 hrs)**

Factors effecting the formation of ionic compound - Lattice energy – Born- Lande equation with derivation - Born Haber cycle and its application - Covalent bond - Valence bond theory and its limitations - Hybridization and shapes of simple molecules ( $\text{BeF}_2$ ,  $\text{PCl}_3$ ,  $\text{SF}_6$ ,  $\text{CH}_4$ ,  $\text{CH}_3\text{-CH}_3$ ,  $\text{CH}_2\text{=CH}_2$ ,  $\text{CH}\equiv\text{CH}$ ) - VSEPR theory – Shape of molecules and ions ( $\text{NH}_3$ ,  $\text{XeF}_6$ ,  $\text{ClF}_3$ ,  $\text{NH}_4^+$ ,  $\text{H}_3\text{O}^+$ ) - Molecular orbital theory - LCAO method - Bond strength and bond

energy -Polarisation and Fajan's rule - Metallic bonding - Free electron and band theory, explanations of metallic properties based on these theories - Weak chemical forces - Hydrogen bond and Vander Waal's forces.

#### **UNIT 4. NUCLEAR CHEMISTRY (9 hrs)**

Radioactivity - rate of radioactive disintegration - Nature of radiation from radioactive elements – stability of nucleus-binding energy-magic numbers-packing fractions-n/p ratio.

Detection and measurement of radioactivity - Gieger-Muller counter - Wilson cloud chamber. Radioactive tracers - Rock dating, Carbon dating - Artificial radio activity - Artificial transmutations of elements - cyclotrons - Induced radio activity - Q values of nuclear reactions - Nuclear reactors - Classification of reactors - Breeder reactor - India's nuclear energy programme.

#### **References**

1. B.R. Puri, L.R. Sharma, K.C. Kalia., "Principles of Inorganic Chemistry, Milestone publishers;, NewDelhi.
2. Alan G. Sharpe, Inorganic Chemistry, Pearson.
3. D.A. Skoog, D.M. West and S.R. Crouch., "Fundamentals of analytical chemistry, Books / Cole Nelson.
4. Vogel's Text Book of Quantitative Chemical Analysis, Pearson Education Ltd.
5. G.D. Christian, Analytical Chemistry, John Wiley and Sons.
6. J. D. Lee., "Concise Inorganic chemistry', Blackwell Science, London.
7. C.N.R. Rao., University General Chemistry, Macmillon, 3<sup>rd</sup> Edn. John Wiley 2001.
8. D.F. Shriver and P.W. Atkins., Inorganic Chemistry 3<sup>rd</sup> Edn., Oxford University press.
9. H.J. Arnikar., "Essentials of Nuclear chemistry", New Age International.
10. R. Gopalan., "Elements of Nuclear chemistry", Vikas publication.



## SEMSTER II

### 2B03CHE : Analytical chemistry

#### Credit-2

#### Contact Hours-36

#### Unit 1- Fundamentals of volumetric, gravimetric and qualitative analysis 9 hrs

Titrimetric analysis – Fundamental concepts – mole, molarity, molality, ppm, and ppb – primary standard – secondary standard, quantitative dilution – problems – acid base titrations – titration curves – pH indicators – redox titrations – titration curves - titrations involving  $\text{MnO}_4^{2-}$  and  $\text{Cr}_2\text{O}_7^{2-}$ , redox indicators - complexometric titrations - EDTA titrations - titration curves - metal ion indicators. Gravimetric analysis – unit operations in gravimetric analysis. Illustration using iron and barium estimation. Qualitative analysis - theoretical principles of qualitative analysis -solubility products - common ion effect - principles in the separations of cations in qualitative analysis

#### Unit -2 - Acids, Bases and non aqueous solvents 9 hrs

Concepts of Lowry and Bronsted – Lux – flood concept – The solvent system concept – The Lewis concept – Relative strength of Acids and Bases – Effect of solvent – Leveling effect – Effect of polarity and substituents – Hard and soft acids and bases – Pearsons concept – Bonding in hard–hard and soft–soft combinations – HSAB principle and its applications – Basis for hard- hard and soft–soft interactions.

Classification of solvents – characteristic properties of a solvent – study of liquid ammonia, liquid HF and  $\text{H}_2\text{SO}_4$ .

#### Unit - 3 – Separation Methods 9hrs

Solvent extraction methods – introduction – completeness of extraction – selectivity of extraction – factors favouring solvent extraction – factors affecting extraction – solvent extraction equilibria quantitative treatment – experimental methods- analytical applications

Chromatographic methods – Adsorption and Partition Chromatography - Brief studies on Liquid-Liquid chromatography, TLC, gas and ion exchange chromatography.

Exclusion (Gel) Chromatography - Gel permeation chromatography – brief introduction, advantages and application of GPC.

**Unit – 4- Instrumental methods in chemical analysis**

**9hrs**

Thermogravimetric analysis – introduction – instrumentation – factors affecting TGA – application of TGA. Differential thermal analysis – introduction – instrumentation – principle of working – factors affecting DTA – application. Thermometric titrations – a brief study. Radio chemical methods of analysis – introduction – activation analysis – a brief study. Neutron diffraction – theoretical aspects – thermal neutron – instrumentation – application.

**References**

1. B R Puri, L R Sharma, K C Kalia, Principles of Inorganic Chemistry, Milestone publishers, New Delhi.
2. D A Skoog, D M West and S R Crouch, Fundamentals of Analytical Chemistry, 8<sup>th</sup> Edition, Brooks/Cole Nelson (Chapter 12-17).
3. Vogel's Text Book of Quantitative Chemical Analysis, 6<sup>th</sup> Edition, Peasons education limited,
4. Vogel's Text Book of Qualitative Analysis
5. G D Christian, Analytical Chemistry, John Wiley and Sons..
6. J.D Lee, Concise inorganic chemistry, Blackwell Science, London
7. Jain & Jain, Engineering Chemistry, Dhanpat Rai Publishing Company.
8. Chatwal and Anand, Instrumental methods of chemical analysis.
9. A K Srivastava, P C Jain Instrumental approach to chemical analysis. S Chand.
10. H. Kaur, Instrumental methods of chemical analysis, Pragati Prakashan, Meerut.

## SEMESTER III

### 3B04CHE : ORGANIC CHEMISTRY I

Credit-3

Contact Hours-54

#### UNIT 1 INTRODUCTION TO ORGANIC CHEMISTRY (6 HOURS)

Uniqueness of carbon-Classification of Organic compounds-Homologous series-Functional groups- IUPAC nomenclature of Organic compounds- Alkanes, Alkenes, Alkynes, Cycloalkanes (bicycloalkanes), Mono and bifunctional compounds - Halogens, Nitro, Alcohols, Ethers, Nitriles, Amines, Aldehydes, Ketones, Carboxylic acids and their derivatives. Hybridisation in carbon atom -  $sp^3$ ,  $sp^2$  and  $sp$  hybridization with examples.

#### UNIT 2 INTRODUCTION TO REACTION MECHANISM (10 HOURS)

Representation of structural formulae –Bonding notations - Drawing electron movements with arrows- curved arrow notation- Half headed and double headed arrows.

Electronegativity- Polarity in bonds- Electron displacement in organic molecules- Inductive effect- Electromeric effect- Mesomeric effect/ Resonance- Hyperconjugation- Their illustrations - Homolytic and Heterolytic bond fission – Reaction intermediates- Carbocations, Carbanions, Free radicals, Carbenes and Nitrenes - Their generation , Structure and stability. Types of reagents – Electrophiles and Nucleophiles.

#### UNIT 3 MECHANISM OF ORGANIC REACTIONS (10 HOURS)

Substrate and reagent- Aliphatic nucleophilic substitutions-mechanism of  $S_N1$ ,  $S_N2$ - Effect of structure on  $S_N1$  and  $S_N2$  as illustrated by Primary, Secondary and Tertiary alkyl halides - Stereo Chemistry of  $S_N1$  and  $S_N2$  reaction – Walden Inversion-Mechanism of Electrophilic addition of Hydrogen halides to Carbon – Carbon double bond- Markownikoff's rule – Kharasch effect (Free radical addition of HBr on unsymmetrical double bond)- Elimination – E1 and E2 mechanism – mechanism of dehydration of alcohol and dehydrohalogenation of alkyl halides – Saytzeff rule and Hofmann's rule.

#### **UNIT 4 HYDROCARBONS (15 HOURS)**

Alkanes – Preparation by Reduction of alkyl halides and Wurtz reaction mechanism of Kolbe's electrolytic method.

Alkenes – Preparation by dehydration of alcohols, dehydrohalogenation of alkylhalides, dehalogenation of vic dihalides and by Kolbe's electrolytic method. Reactions – Hydrogenation, addition of halogens, halogen acid and water. Oxidation with  $\text{KMnO}_4$ ,  $\text{K}_2\text{Cr}_2\text{O}_7$  and Osmium tetroxide, Ozonolysis and polymerization.

Alkynes – Preparation by dehydrohalogenation of vic dihalides and gem dihalides, dehalogenation of tetrahalides and Kolbe's electrolytic method. Reactions, addition of Hydrogen, Halogen, Halogen acid and water – oxidation using alkaline  $\text{KMnO}_4$ , Acidic  $\text{K}_2\text{Cr}_2\text{O}_7$  and Selenium dioxide. Ozonolysis and Polymerization reactions specific to 1-alkyne.

Dienes – Conjugated, cumulated and isolated dienes with example, preparation of 1, 3 butadiene-by dehydration of diols. Reactions of 1, 3 butadiene – 1,2 and 1,4 additions, polymerization.

Polynuclear Hydrocarbons- Haworth Synthesis of naphthalene, synthesis of Anthracene from benzyl chloride.

Cycloalkane – Preparation by Freund's and Wislicenus methods.

#### **UNIT 5 HALOGEN COMPOUNDS (5 HOURS)**

Alkyl halides – preparation from alcohol – Reaction of alkyl halides with metal.

Dihalides – Gem dihalides and Vic dihalides – General methods of preparation – General reaction.

Trihalogen derivative of methane – Chloroform – preparation from ethanol and acetone – Haloform reaction.

#### **UNIT 6 HYDROXY COMPOUNDS (8 HOURS)**

Alcohols – Preparation of monohydric alcohols from carbonyl compounds using Grignard reagents – Methods to distinguish  $1^\circ$ ,  $2^\circ$  and  $3^\circ$  alcohols – Lucas method, Victor Meyer's method and oxidation method – Ascent and descent in alcohol series.

Glycerol – Manufacture from fats and oils – Synthesis from propylene – Properties and uses.

Phenols – Acidic character of phenol – Preparation of phenol from cumene –Preparation of cresols, nitrophenols, picric acid, dihydric phenols and naphthols. Phenolic ethers – Preparation of anisole and phenetole.Mechanism of Pinacol - Pinacolone, Fries and Claisen rearrangements.

### References

1. M. K. Jain and S. C. Sharma ‘Modern Organic Chemistry’, Visal Publishing Company Co.
2. K. S. Tewari and N. K. Vishnoi ‘Organic Chemistry’, Vikas Publishing House
3. B. S. Bahl ‘Advanced organic Chemistry’, S. Chand.
4. Peter Sykes, ‘A Guide book to Mechanism in Organic Chemistry’ , Pearson . Education
5. P. S. Kalsi’ ‘Organic Reactions and their Mechanisms’’ New Age International . Publishers
6. R. T. Morrison and R. N. Boyd, ‘Organic Chemistry’, Prentice Hall of India
7. I. L. Finar, ‘Organic Chemistry’, Vol.- I, Pearson Education

### Further Reading

1. P. Y. Bruice, ‘Organic Chemistry’, Pearson Education.
2. J. March, ‘Advanced Organic Chemistry’, John Wiley & Sons, NY
3. S. H. Pine ‘Organic Chemistry’, McGraw Hill
4. J. Clayden, N. Greeves, S. Warren and P. Wothers, ‘Organic Chemistry’, Oxford University Press

## SEMESTER IV

### 4B06CHE- ORGANIC CHEMISTRY II

**Credit-3**

**Contact Hours-54**

#### **UNIT 1 AROMATICITY (12 HOURS)**

Structure of Benzene – Aromaticity and antiaromaticity - Molecular Orbital Theory of aromaticity- Huckel's rule- Six electron systems- Mention of structures of some non benzenoid aromatic compounds-cyclopropenyl cation-cyclopentadienyl anion- ferrocene-tropylium cation-azulene.

Mechanism of aromatic electrophilic substitution-Halogenation, Nitration and Sulphonation - Friedel –Craft's alkylation and acylation—Orientation and reactivity in monosubstituted benzene rings- Ortho/para ratio-Aromatic nucleophilic substitution- S<sub>N</sub>Ar mechanism and Benzyne mechanism

#### **UNIT 2 STEREOCHEMISTRY (16 HOURS)**

Stereoisomerism - definition - classification into optical and geometrical isomerism - Projection formulae - Fischer, wedge, sawhorse and Newman projection formulae - notation of optical isomers -D-L notation- Cahn-Ingold-Prelog rules - R-S notations for optical isomers with one and two asymmetric carbon atoms - erythro and threo representations.

Optical isomerism - optical activity - optical and specific rotations - conditions for optical activity - asymmetric centre - chirality - achiral molecules - meaning of (+) and (-) - Elements of symmetry -Racemisation - Resolution - methods of resolution- Optical activity in compounds not containing asymmetric carbon atoms- Biphenyls.

Geometrical isomerism - cis-trans, syn-anti and E-Z notations - geometrical isomerism in maleic and fumaric acids.

Conformational analysis - introduction of terms - conformers, dihedral angle, torsional strain - Conformational analysis of ethane and n-butane including energy diagrams - conformers of cyclohexane (chair, boat, half chair and twist boat forms) - axial and equatorial bonds-ring flipping showing axial equatorial interconversions- conformation of methyl cyclohexane.

### **UNIT 3 CARBOHYDRATES (12 HOURS)**

Definition- Classification and nomenclature of carbohydrates.

Monosaccharides-Configuration of Aldotrioses, Tetroses, Pentoses and Hexoses- Structure and configuration of glucose and fructose- Cyclic structure- Haworth projection formula-reactions of glucose and fructose- Mutarotations- ascent and descent in aldoses- Interconversion of aldoses and ketoses- Anomers, Epimers and Epimerisation-Conversion of an aldose into its epimer.

Disaccharides- Configurational open chain and ring structure of sucrose, maltose and lactose (structural elucidation not expected)

Poly saccharides- Elementary study of starch and cellulose – structural difference between starch and cellulose- Industrial uses of cellulose.

### **UNIT 4 HETEROCYCLIC COMPOUNDS (8 HOURS)**

Nomenclature of 5 and 6 membered heterocyclic compounds-Preparation, properties and structure of the following compounds- Pyrrole, Furan, Thiophene, Pyridine, Indole, Quinoline, Isoquinoline and pyrimidine- Relative basic character of Pyrrole, pyridine and piperidine- Hofmann's exhaustive methylation of piperidine.

### **UNIT 5 POLYMER CHEMISTRY (6 HOURS)**

Classification – Natural and synthetic polymers – Thermoplastics and thermosetting plastics – Elastomers – Fibres – Liquid resins – Types of polymerization –Chain and step polymerization – Homopolymers and Co-polymers – Synthesis and application of Polyethylene, Polypropylene, PVC, Polystyrene, Polyurethanes, Phenolic and Epoxy resins – Synthetic rubber – Buna-S, Buna-Neoprene, and Butyl rubber-Biodegradability.

### **References**

1. M. K. Jain and S. C. Sharma 'Modern Organic Chemistry' 3rd Edition, Visal Publishing Company Co.
2. K. S. Tewari and N. K. Vishnoi 'Organic Chemistry', 3rd Edition, Vikas Publishing House

3. B. S. Bahl 'Advanced organic Chemistry', S. Chand.
4. P. S. Kalsi' 'Stereochemistry, Conformation and Mechanisms'' New Age International Publishers.
5. R. T. Morrison and R. N. Boyd, 'Organic Chemistry', 6th Edition - Prentice Hall of India.
6. I. L. Finar 'Organic Chemistry', Vol.- 1, Pearson Education
7. I. L. Finar 'Organic Chemistry', Vol.- 2, Pearson Education
8. Gowariker V.R., Viswanathan N.V. and Jayader Sreedhar,' Polymer Science', Wiley Eastern Ltd., New Delhi.

### **Further Reading**

1. P. Y. Bruice, 'Organic Chemistry', Pearson Education.
2. J. March, 'Advanced Organic Chemistry', John Wiley & Sons, NY
3. S. H. Pine 'Organic Chemistry', McGraw Hill
4. J. Clayden, N. Greeves, S. Warren and P. Wothers, 'Organic Chemistry', Oxford University Press
5. D. Nasipuri 'Stereochemistry of Organic Compounds', New Age International Publishers.
6. Billmeyer F.W., 'Text book of polymer science', Jr. John Wiley and Sons, 1994.



## SEMESTER V

### 5B07CHE-INORGANIC CHEMISTRY-I

**Credit-4**

**Contact Hours-54**

#### **UNIT1.GENERAL PROPERTIES OF ELEMENTS ( 9hrs)**

Covalent and ionic radii--Trends in the periodic table. Periodic properties-- Ionisation energy. Electron affinity and Electronegativity (Pauling and Mulliken's, approach). Metallic character.Variable valency and Oxidation states.

General properties of transition elements – Electronic configurations,Oxidation states, colour, magnetic properties, tendency to form complexes and catalytic properties.

Comparison of first transition series with second and third series.

#### **UNIT 2.CHEMISTRY OF S BLOCK ELEMENTS(9hrs)**

**Hydrogen** : Isotopes (separation method not needed) Ortho and para hydrogen Hydrides and their classification.

**Alkali and alkaline earth metals:** Occurrence and extraction (principle only). Periodic properties of hydrides, oxides, halides,hydroxides and carbonates. Flame colours and spectra. Metal solutions in liquid ammonia –characteristic properties and uses. Diagonal relationship. Macro cycles- Crowns and crypts.

#### **UNIT 3.CHEMISTRY OF P BLOCK ELEMENTS (9hrs)**

Comparative study based on electronic configuration and periodic properties of Hydrides,Oxides,Halides,Carbides and Oxoacids. Inert pair effect.

Metallic and non-metallic character. Acid-base properties of oxides. Hydrolysis of halides. Exceptional behavior of second period element in the following groups of elements-Group13 (B,Al,Ga,In andTl). Group14 (C,Si,Ge,Sn and Pb) Group15 (N,P,As,Sb and Bi). Group16 (O,S,Se,Te and Po) and Group17 (F,Cl,Br and I).

#### **UNIT 4. NOBLE GASES (9hrs)**

History of discovery of noble gases. Electronic configuration and position in the periodic table. General physical properties, uses of noble gases. Compounds of noble gases—Clathrates, compounds of Xenon—XeF<sub>2</sub>, XeF<sub>4</sub>, XeF<sub>6</sub>, XeO<sub>2</sub>F<sub>2</sub>, XeOF<sub>2</sub>, XeOF<sub>4</sub> and XeO<sub>3</sub>. Preparation, hybridization and geometry of these compounds. Fluorides of Krypton and Radon.

#### **UNIT 5. PREPARATION, PROPERTIES, STRUCTURE AND USES OF SOME INORGANIC COMPOUNDS (9hrs)**

Hydrides of boron – B<sub>2</sub>H<sub>6</sub> and B<sub>4</sub>H<sub>10</sub>. Borazine, Boric acid, oxoacids of halogens, Inter halogen compounds, Pseudo halogens, Fluorocarbons.

##### **Inorganic polymers**

Phosphorous based, sulphur based and silicon based - silicones and silicates - polymers.

##### **Refractories**

Introduction- classification- super refractories - silicon carbide. Pure oxide refractories.

#### **UNIT 6. ORGANOMETALLIC COMPOUNDS (9hrs)**

Introduction. Classification based on the nature of metal-carbon bond.

preparation, properties, structure - valence bond theory - and uses of mononuclear (Ni, Fe), binuclear (Fe, Mn, Co) and trinuclear (Fe) metal carbonyls - Application of 18 electron rule to predict M-M bond. Preparation, properties, structure and bonding of Ferrocene.

##### **References**

1. F. A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry 5th edn., John Wiley, New York.
2. J. D. Lee, Concise Inorganic Chemistry 5th edn., Blackwell Science, London.
3. D. F. Shriver and P.W. Atkins, Inorganic Chemistry 3rd edn., Oxford University Press.
4. R. C. Mehrotra and A. Singh, Organometallic chemistry, New age publishers.
5. J. E. Huheey, E. A. Keiter, R. L. Keiter, O K Medhi, Inorganic Chemistry, Pearson.

6. B. R. Puri, L. R. Sharma, K. C. Kalia, Principles of Inorganic Chemistry, Milestone Publishers, New Delhi.
7. Emelus and Anderson, Principles of Inorganic Chemistry.
8. Dr. S.K.Agarwala and Dr. Keemtilal, Advanced Inorganic Chemistry.
9. Jain and Jain, Engineering Chemistry.,Dhanpat Rai Publishing Company.

## SEMESTER V

### 5B08CHE-INORGANIC CHEMISTRY –II

**Credit-4**

**Contact hours:54**

#### **UNIT 1. COORDINATION CHEMISTRY- I (9hrs)**

Introduction-Double salts and Coordination compounds. Nomenclature. Effective Atomic Number (EAN). Shapes of d orbitals.-Types of ligands. Chelates. Stereo chemistry of coordination compounds with coordination numbers 2 to 6. Isomerism. Stability of complex ions-stability constant. Factors affecting the stability of complexes. Application of complex formation in qualitative and quantitative analysis.

#### **UNIT 2. COORDINATION CHEMISTRY- II (9hrs)**

Theories of bonding in transition metal complexes– Valence bond theory . Application to some complexes-Hybridization in tetrahedral, square planar and octahedral complexes – explanation of magnetic properties based on VBT. Limitations of VBT. Crystal field theory- Crystal field splitting in octahedral, tetrahedral and square planar geometries. Factors affecting the magnitude of crystal field splitting. Crystal field stabilization energy(CFSE). Explanation of colour, spectral and magnetic properties .Spectrochemical series.

#### **UNIT 3. BIOINORGANIC CHEMISTRY(9hrs)**

Myoglobin and Haemoglobin - Structure and functions of haemoglobin and myoglobin. Cooperativity effect.Explanation of cooperativity effect in haemoglobin.Metallo enzymes of iron and zinc (structural details not needed).Role of metal ions in biological systems. Metal ion transport across cell membrane – sodium/potassium pump. Biochemistry of Mg and CaBiological functions and toxicity of some elements - Cr, Mn,Co,Ni,Cu,As,Cd,Pb,Hg, I, Fe, and Zn.Biological fixation of nitrogen.

#### **UNIT 4. INNER TRANSITION ELEMENTS.(9hrs).**

**Lanthanides** – Occurrence and separation by ion - exchange chromatography.Electronic configurations,oxidation states,magnetic properties and spectra of lanthanides. Lanthanide contraction—causes and consequences.

**Actinides** : Electronic configurations, oxidation states, spectra and magnetic properties. Trans actinide elements – Preparation, IUPAC nomenclature.

Comparison of transition and inner transition elements

#### **UNIT 5.METALS AND ALLOYS (9hrs)**

Occurrence of metals. Various steps involved in metallurgical processes.

Electrometallurgy, Hydrometallurgy.

Coinage metals-Occurrence and extraction of copper, silver and gold.

Powder metallurgy(brief discussion). Alloy steels-application of alloy steels. Heat treatment of steel. Nonferrous alloys and their uses.

#### **UNIT 6.CORROSION AND CORROSION CONTROL(9hrs)** Introduction.

Types of corrosion. Causes of corrosion. Theories of corrosion- Direct chemical attack or dry corrosion. Electrochemical theory or wet corrosion. Differential

Aeration or concentration cell corrosion.

Factors influencing corrosion- nature of the metal- nature of the environment.

Corrosion control.

#### **References**

- 1.F. A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry ., John Wiley, New York.
2. J. D. Lee, Concise Inorganic Chemistry ., Blackwell Science, London.
3. D. F. Shriver and P.W. Atkins, Inorganic Chemistry ., Oxford University Press.
4. J. E. Huheey, E. A. Keiter, R. L. Keiter, O K Medhi, Inorganic Chemistry, Pearson.
5. A G Sharpe, Inorganic Chemistry, 3rd Edn. Pearson
- 6 Principles of Inorganic Chemistry – Emelus and Anderson
7. Advanced Inorganic Chemistry –Dr. S.K.Agarwala and Dr.Keemtilal
- 8.Industrial chemistry—B.K.Sharma
- 9.Engineering chemistry,2<sup>nd</sup> Edn.-N.Krishnamoorthi, P.Vallinayagam,D.Madhavan

## SEMESTER V

### 5B09CHE PHYSICAL CHEMISTRY – 1

**Credit- 4**

**Contact hrs 54**

#### **UNIT 1 The Properties of Gases (15 hrs)**

Gas laws – The general gas equation– The Kinetic model of gases – gas laws from the kinetic theory of gases ---Molecular Speeds – Maxwell's distribution of molecular speeds – Most probable velocity, average velocity and root mean square velocity — Collision diameter – Mean free path, Collision number and collision frequency – Degrees of freedom of a gaseous molecule – Principle of equipartition of energy and contribution towards heat capacity of an ideal gas.

Real gases – Molecular attractions – The compressibility factor – virial equation of state – Van der waals equation expressed in virial form – calculation of Boyle's temperature – Isotherm of real gases and their comparison with Van der waals isotherms – continuity of states – critical phenomenon – critical constants of a gas and its determination – Determination of molecular mass by limiting density method – Principle of corresponding states – Liquefaction of gases by Joule Thomson effect.

#### **UNIT 2 Liquid State (7hrs)**

Properties of liquids– Surface tension and its determination – Interfacial tension – surface active agents –effect of temperature on surface tension- Parachor and its applications – Viscosity -determination of coefficient of viscosity and its variation with temperature – refractive index – specific and molar refraction – Measurement of refractive index – Abbe's refractometer – optical activity and its measurement using Polarimeter.

#### **UNIT 3 Solid State (16 hrs)**

Amorphous and crystalline solids – Laws of crystallography – Law of constancy of interfacial angles – Law of constancy of symmetry – Law of rationality of indices – space lattice and unit cell – Miller indices –seven crystallographic systems – Bravais lattices – Spacing of lattice planes in simple cubic, body centred and face centred cubic systems – Number of particles per unit cell in each of these - Calculation of Avogadro number, density and molecular mass from crystallographic data. Determination of internal structure of crystals

by X-ray diffraction methods – derivation of Bragg's equation – Bragg's rotating crystal method and Debye Scherrer Powder diffraction method – Crystal structure of NaCl – anomalous nature of diffraction pattern of KCl.

Co-ordination Number – Efficiency of packing – Cubic and Hexagonal packing – Radius ratio rule – Tetrahedral and Octahedral voids.

Liquid crystals – types – Examples – applications

Classification based on cohesive forces in crystals-ionic, covalent, molecular and metallic crystals - Properties of solids – Electrical conductivity – Conductor, semiconductors– extrinsic, intrinsic-n-type and p-type – Hall effect – super conductors – magnetic properties of solids.

#### **UNIT 4 Solutions (16 hrs)**

Types of solutions and methods for expressing concentration — Gas Liquid system — Henry's Law – Liquid systems — Completely miscible- Ideal and non- ideal solutions – Raoult's Law – Vapour pressure – composition diagrams-Azeotropic mixtures– Temperature – composition curves – Partially miscible liquids –Upper and Lower Critical solution temperature –Immiscible liquids – Steam distillation – Molar mass from steam distillation –

##### **Dilute Solutions**

Colligative properties – Lowering of vapour pressure and Raoult's law – Calculation of molar mass. Elevation of boiling point – relation to lowering of vapour pressure – Thermodynamic derivation – Calculation of molar mass –Depression of freezing point – Thermodynamic derivation – Calculation of molar mass – Measurement by Beckmann's method – Osmotic pressure – Measurement by Berkely and Hartley's method – Laws of Osmotic pressure – Van't Hoff equation – Calculation of molar mass – Abnormal molar mass – Van't Hoff factor – Degree of dissociation and association and their calculation from colligative properties

#### **References**

1. Physical Chemistry : P.W. Atkins, Oxford University Press
2. Physical Chemistry : Puri, Sharma and Pathania, Vishal Publishing Co.
3. A Text book of Physical Chemistry: A S Negi and S C Anand, New Age International Publishers.
4. A Textbook of Physical chemistry: K. L. Kapoor, Volume 1, Macmillan India Ltd

5. Text book of Physical Chemistry : Samuel Glasstone, McMillan Press Ltd.
6. Advanced Physical Chemistry: Gurdeep Raj, Goel Publishing House, Meerut.
7. Physical Chemistry: W.J. Moore, Orient Longmans.
8. Physical Chemistry: N. Kundu & S.K. Jain, S.Chand & Company.
9. Introduction to solids Leonid V Azaroff



## SEMESTER V

### 5B10CHE PHYSICAL CHEMISTRY – II

Credit 4

Contact hrs 54

#### UNIT 1 Thermodynamics (15 hrs)

The first Law – the basic concepts – System – surrounding– open, closed and isolated system — intensive and extensive properties -Isothermal, Isochoric and Isobaric process – work – Heat – Energy — state and path functions – exact and inexact differentials– The statement of first law – – the conservation of energy– Internal energy – Expansion work – general expression of work – free expansion – Expansion against constant pressure – reversible expansion– Heat capacity at constant volume ( $C_v$ ) and at constant pressure ( $C_p$ ) – relation between  $C_p$  and  $C_v$  – Thermodynamic derivation– Adiabatic change –Relation between  $P, V$  &  $T$  in reversible adiabatic change - work of adiabatic change. The internal pressure –Changes in enthalpy at constant volume – isothermal compressibility – Joule – Thomson effect – inversion temperature -Zeroth Law of Thermodynamics.

Thermo chemistry – Standard enthalpy changes – Enthalpies of physical change – Enthalpy of vapourisation, enthalpy of transition and enthalpy of fusion – enthalpy chemical changes – Thermo chemical equation – Standard enthalpy of reaction, combustion and formation – Change in internal energy( $\Delta U$ ) and enthalpy ( $\Delta H$ ) of chemical reactions, relation between  $\Delta U$  and  $\Delta H$ , variation of enthalpy of reaction with temperature-Kirchhoff's equation.

#### UNIT 2 Thermodynamics II (12 hrs)

The Second Law – the concepts – Spontaneous and non-spontaneous process – statement of second law – Entropy –Entropy as a state function – Carnot cycle – efficiency of a heat engine– Entropy changes in isothermal expansion of an ideal gas –Calculation of entropy change of an ideal gas with change in  $P, V$  and  $T$  –Entropy changes accompanying phase transitions.

Helmholtz and Gibbs free energies – their significance – Maxwell's relations – Criteria of spontaneity – Gibbs–Helmholtz equation – Partial molar free energy – Concept of chemical potential – Gibbs - Duhem equation– Clausius – Clapeyron equation applicable to solid – liquid, solid-vapour and liquid-vapour equilibria.

Third Law of thermodynamics – The Nernst heat theorem – Absolute entropy – Calculation of absolute entropies of solids, liquids and gases

### **UNIT 3 Chemical Equilibrium(8 hrs)**

Law of mass action-equilibrium constant – Relation between  $K_p$ ,  $K_c$  and  $K_x$  – Thermodynamic treatment of the law of mass action – Vant Hoff reaction isotherm – Temperature dependence of the equilibrium constant – The Van't Hoff's isochore– Pressure dependence of the equilibrium constant  $K_p$ – Study of heterogeneous equilibria – Factors that change the state of equilibrium – Le –chatelier's principle and its application to chemical and physical equilibria. Mention homogeneous gaseous equilibria having zero, positive and negative values of  $\Delta n$ . Calculation of degree of dissociation and  $K_p$ . Heterogeneous equilibria –Dissociation of solid calcium carbonate and decomposition of solid  $\text{NH}_4\text{HS}$ .

### **UNIT 4 Phase Rule (10 hrs)**

Statement – Explanation of terms involved – Thermodynamic derivation of phase rule – Application to water system and sulphur system – Solid – liquid equilibria involving simple eutectic system – Ag-Pb system – De silverisation of lead – Freezing mixtures – Solid – liquid equilibria involving compound formation with congruent and incongruent melting points–  $\text{FeCl}_3\text{-H}_2\text{O}$  system and  $\text{Na}_2\text{SO}_4$  water system – Solid – gas system – Dehydration of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ -Deliquescence and efflorescence (mention only). Nernst distribution Law – Thermodynamic derivation– Limitations of the law – Application of the law to study association and dissociation – Solvent extraction – Hydrolysis of salts – The equilibrium of  $\text{KI} + \text{I}_2 \rightarrow \text{KI}_3$  .

### **UNIT4 Colloids, Surface Chemistry (9 hrs)**

Colloids, Classification – preparation – structure and stability – The electrical double layer – Zeta potential (no derivation)– Properties of Colloids – Tyndall effect – Brownian movement – Coagulation of colloidal solution – Hardy – Schulze rule – Flocculation value – Electro kinetic properties – Electrophoresis – Electro-osmosis – Protective colloids – Gold number – Emulsion – Oil in water emulsion and water in oil emulsion – Emulsifying agents – Gels – Micelles.

Physical and chemical adsorption – Adsorption isotherms – Freundlich adsorption isotherm – effect of temperature on adsorption – Langmuir adsorption isotherm – derivation – use and

limitation. B.E.T. equations (B.E.T. no derivation) – Gibbs adsorption equation (no derivation)  
— Surface films - Determination of surface area using Langmuir equations.

## References

1. Physical Chemistry : P.W. Atkins, Oxford University Press
2. Physical Chemistry : Puri, Sharma and Pathania, Vishal Publishing Co.
3. A Text book of Physical Chemistry: A S Negi and S C Anand, New Age International Publishers.
4. A Textbook of Physical chemistry: K. L. Kapoor, Volumes 2 &3, Macmillan India Ltd
5. Text book of Physical Chemistry : Samuel Glasstone, McMillan Press
6. Advanced Physical Chemistry: Gurdeep Raj, Goel Publishing House, Meerut.
7. Physical Chemistry: W.J. Moore, Orient Longmans.
8. Physical Chemistry: N. Kundu & S.K. Jain, S.Chand & Company.
9. Chemical Thermodynamics: J.Rajaram and J.C.kuriacose, Pearson.

## SEMESTER VI

### 6B14CHE ORGANIC CHEMISTRY III

Credit 4

Contact Hours-72

#### UNIT 1 - CARBONYL COMPOUNDS (12 HOURS)

Preparation of aldehydes and ketones – Rosenmund's reduction, Stephen's reduction, Etard's reaction, Oppenauer oxidation, Houben – Hoesh synthesis. Reactions of aldehydes and ketones. Reduction using  $\text{LiAlH}_4$  and  $\text{NaBH}_4$  MPV, Clemensen and Wolf-Kishner reduction. Reduction to pinacols – Oxidation using mild and strong oxidizing agents –  $\text{SeO}_2$  oxidation – Reaction with alcohols, KCN, sodium bisulphite and derivatives of ammonia – Distinction between acetaldehyde and benzaldehyde and acetaldehyde and acetone.

Mechanism of the following reactions – Aldol condensation, Cannizzaro's reaction, Crossed Cannizzaro's reaction, Reimer – Tiemann reaction, Perkin's reaction, Benzoin condensation and Beckmann rearrangement. Reaction of formaldehyde with aldehydes containing alpha hydrogen atoms.

Preparation of acrolein, crotonaldehyde and vanillin.

Quinones – Preparation and important reactions of p-benzoquinone, 1, 4 -Naphthaquinone and 9, 10 - Anthraquinone.

#### UNIT 2 -CARBOXYLIC ACIDS (8 HOURS)

Carboxylic acids – Ascent and descent in aliphatic acid series, Preparation and reactions of acrylic and crotonic acids.

Hydroxy acids – Effect of heat on alpha, beta, gamma and delta hydroxyl acids – Preparation and reactions of lactic acid, tartaric acid and citric acid.

Dicarboxylic acids – Preparation and reactions of oxalic, malonic, succinic, maleic and fumaric acids – Blanc's rule.

Aromatic acids – Preparation and reactions of Benzoic acid, anthranilic acid, salicylic acid, cinnamic acid and phthalic acid.

### **UNIT 3- NITROGEN COMPOUNDS (14 HOURS)**

Cyanides and Isocyanides – Distinction between cyanides and isocyanides.

Nitroalkanes – General methods of preparation and reactions of primary, secondary and tertiary nitroalkanes. Distinction between primary, secondary and tertiary nitroalkanes.

Aromatic nitrocompounds – Reduction of nitrobenzene under different conditions – Preparation of dinitrobenzene, 1, 3, 5 – trinitrobenzene, nitrotoluenes and 2, 4, 6 – trinitrotoluene –Mechanism of Benzidine rearrangement.

Amines – Separation of primary, secondary and tertiary amines – Hinsberg and Hoffmann method to distinguish primary, secondary and tertiary amines. Preparation of quaternary ammonium salts.

Aromatic amines – Preparation and reactions of aniline, toluidines, phenylene diamines, diphenyl amine, N-Methyl aniline, N, N-dimethyl aniline and naphthyl amines. Distinction between benzyl amine and toluidine.

Diazonium salts – Preparation, synthetic applications and structure of benzene diazonium chloride, Diazomethane and diazoacetic ester-Ardnt-Eistert synthesis – Wolf rearrangement – mechanism.

Preparation, Properties and structure of urea- Preparation and reactions of semicarbazide and thiourea – Preparation of Urethane.

### **UNIT 4 PHOTOCHEMISTRY AND PERICYCLIC REACTIONS (7 HOURS)**

Introduction to photochemistry- Photochemical reactions of carbonyl compounds (Acyclic only)- Norrish type I and II cleavages

Types of pericyclic reactions-Woodward –Hoffman rule- Electrocyclic reactions- Analysis of electrocyclic reactions (Butadiene to Cyclobutene only)- Cycloadditions- Examples- Diels Alder reaction- Analysis of [2+2] cycloaddition by FMO method.

### **UNIT 5 SYNTHETIC REAGENTS (6 HOURS)**

Active methylene group- Preparation and synthetic application of Ethyl acetoacetate, Diethyl malonate and Ethyl cyano acetate- Mechanism of Claisen condensation- Preparation

and synthetic applications of Grignard reagents and Frankland reagent-mechanism of Reformatsky reaction.

## **UNIT 6 BIOORGANIC CHEMISTRY AND NATURAL PRODUCTS (13 HOURS)**

Amino acids- Classification- Structure of Glycine, Alanine, Phenyl amine, Tryptophan and Glutamic acid ( Structure elucidation not expected) Synthesis of amino acids- Gabriel, Strecker and Erlemeyer synthesis- Zwitter ion property- Isoelectric point- Sorenson formal titration- Peptides and poly peptides- C-terminal and N-terminal analysis. Proteins- Functions of proteins- Primary , secondary and tertiary structure of proteins- Nucleic acids- Introduction- Nucleosides and Nucleotides- Structure (elucidation not expected) of DNA and RNA- Self replication- Protein synthesis- Lipids- Biological function of different types of lipids  
Terpenes- Definition- Isoprene rule- Occurrence, isolation and structural elucidation of Citral - natural rubber.  
Alkaloids- Introduction- Properties and structure of Coniine, Nicotine and Quinine- Structural elucidation of Coniine only.  
Steroids- General characteristics, structure of cholesterol, Testosterone and Oestrone.

## **UNIT 7 DYES AND DRUGS (7 HOURS)**

Dyes- classification of dyes based on structure and application- Structures of Malachite green- Methyl orange- Eosin- Indigo- Crystal violet- Fluorescein and Alizarine ( structure elucidation not expected)  
Chemotherapeutic agents- classification, Drug action- Antibiotics- Discovery, importance, mode of action and examples- Misuse of antibiotics- Sulpha drugs-mode of action- Importance- Examples and uses. Antipyretics & analgesic- examples-uses. Anesthetic, Antiseptic, Antihistamines and tranquillizers, narcotics- their actions and examples. Misuse of drugs.

## **UNIT 8 GREEN CHEMISTRY (5 HOURS)**

Need for Green chemistry – Goals of green chemistry – Limitations.

Twelve principles of green chemistry with their explanations and examples – Designing a green synthesis – Prevention of waste / byproducts – Atom economy (maximum incorporation of materials used in the process) – Minimization of hazardous / toxic products. Green synthesis – Microwave assisted reactions in water – Hoffmann Elimination – Microwave assisted reaction in organic solvent – Diels Alder reaction, Ultrasound assisted reaction – Esterification, Saponification. Green chemistry in day to day life.

### References

1. M. K. Jain and S. C. Sharma 'Modern Organic Chemistry', Visal Publishing Company Co.
2. K. S. Tewari and N. K. Vishnoi 'Organic Chemistry', Vikas Publishing House
3. B. S. Bahl 'Advanced organic Chemistry', S. Chand.
4. Peter Sykes, A Guide book to Mechanism in Organic Chemistry , Pearson Education.
5. P. S. Kalsi' 'Organic Reactions and their Mechanisms'' New Age International Publishers.
6. R. T. Morrison and R. N. Boyd, 'Organic Chemistry', Pearson Education.
7. I. L. Finar Organic Chemistry, Vol.- II, Pearson Education
8. M.S.Yadav, 'Synthetic drugs'
9. V.K. Ahluwalia, M. Kidwai 'New trends in Green Chemistry', Anamaya Publishers.
10. V. Kumar, 'Introduction to Green Chemistry', Vishal Publishing House.

### Further Reading

1. P. Y. Bruice, 'Organic Chemistry', Pearson Education.
2. J. March, 'Advanced Organic Chemistry', John Wiley & Sons, NY
3. S. H. Pine 'Organic Chemistry', McGraw Hill
4. J. Clayden, N. Greeves, S. Warren and P. Wothers, 'Organic Chemistry', Oxford University Press

## SEMESTER VI

### 6B15CHE PHYSICAL CHEMISTRY III

**Credit 3**

**Contact hrs 72**

#### **UNIT 1 Electrical Conductance (15 hrs)**

Ohm's Law – Electrical energy – volt – coulomb – Mechanism of electrical conduction – Arrhenius theory – The laws of electrolysis – Faraday's law and its significance – Transference Number – Determination by Hittorf's method and moving boundary method. Equivalent conductance and Molar conductance Effect of Dilution on conductance – Effect of dielectric constants of solvents – Ionic mobilities – Kohlrausch's Law – applications – Mobilities of Hydrogen and Hydroxyl ions – Diffusion and ionic mobility. Activity and activity coefficient – standard state ionic activities and activity coefficient – ionic strength – Debye – Huckel Theory – Ionic atmosphere – Debye – Huckel limiting law – determination of solubilities by conductance measurements – conductometric titrations – conductance in non-aqueous solvents – Temperature dependence of ionic conductance.

#### **UNIT 2 Ionic Equilibria (14 hrs)**

Acids and bases –Arrhenius Concept- Lowry – Bronsted concept – Dissociation of acids and bases – Lewis concept of acids and bases – hard and soft acids and bases and its applications – Ionic product of water – Dissociation constants of acids and bases – pH and its determination – Heat of neutralization – Incomplete neutralization – Hydrolysis of different types of salts – Degree of hydrolysis and hydrolytic constant – and its relation with pH and pOH – Buffer solution – pH of Buffer solution – Henderson's equation – Buffer capacity – Application of buffer – Acid – base indicators –Theory of acid – base indicators.

#### **UNIT 3 Electromotive Force (20 hrs)**

Electrochemical cell-Daniell cell – Reversible and Irreversible cell – Single electrode potential – EMF of cells – Standard potential and standard emf – Standard Hydrogen electrode and calomel electrode – Types of electrodes – electrode reaction – cell reaction



Nernst equation for electrode potential and emf of the cell – Electrochemical series – IUPAC sign convention – Application of Gibb's Helmholtz equation to galvanic cells – Calculation of  $\Delta G$ ,  $\Delta H$ ,  $\Delta S$  and equilibrium constant from emf data – The standard cells – Weston Cadmium cell and its emf. Concentration cells – Electrode and electrolytic concentration cells with and without transference and their emfs – Liquid junction potential – Elimination of liquid junction potential – salt bridge – application of potential measurements – Determination of solubility product, ionic product of water, transport number and the pH value – Hydrogen, Quinhydrone electrode and glass electrode – potentiometric titration – redox indicators — Fuel cells. (hydrogen-oxygen, hydrocarbon-oxygen)

#### **UNIT 4 Chemical Kinetics (15 hrs)**

The rates of chemical reactions – Experimental techniques – rate laws and rate constant – Order and molecularity of reactions – Methods of determining the order of reaction – Integrated rate laws of zero order, first order and second order reactions — General integrated rate equation for nth order reaction - Zero and fractional order reactions - Half life –Examples of consecutive parallel and opposing reactions (first order only). Temperature dependence of reaction rates – Arrhenius equation – Interpretation of parameters – steady state approximation – Kinetics of unimolecular reactions –Lindemann's theory.

Theories of reaction rates – collision theory – Derivation of rate equation for second order reaction from collision theory – thermodynamic approach of transition state theory – Entropy activation.

Catalysis – Homogeneous and Heterogeneous catalysis – examples – Features of homogeneous catalysis – Enzymes – Michalis – menten mechanism. Heterogenous catalysis – Langmuir – Hinshelwood mechanism – Kinetics of unimolecular surface reactions.

#### **UNIT 5 Photo Chemistry (8hrs)**

Photochemistry – consequences of light absorption – The Jablonski diagrams – Radiative and non radiative transition – Light absorption by solutions – Lambert – Beer Law – Laws of photochemistry – The Grotthus – Draper law – Stark – Einstein law – Quantum efficiency / Quantum yield – Experimental determination of quantum yield – High and low quantum yield -Photochemical rate law – Energy transfer in photochemical reactions – Photo sensitisation and quenching – Chemiluminescence – Lasers – uses.

## References

1. Physical Chemistry : P.W. Atkins, Oxford University Press.
2. Physical Chemistry : Puri, Sharma and Pathania, Vishal Publishing Co.
3. A Text book of Physical Chemistry: A S Negi and S C Anand, New Age International Publishers.
4. A Textbook of Physical chemistry: K. L. Kapoor, Volumes 1 &5, Macmillan India Ltd
5. Advanced Physical Chemistry: Gurdeep Raj, Goel Publishing House, Meerut.
6. Physical Chemistry: W.J. Moore, Orient Longmans.
7. Physical Chemistry: N. Kundu & S.K. Jain, S.Chand & Company.
8. Physical Chemistry : K. J. Laidler, John H.Meiser,
9. Chemical Kinetics : K.J.Laidler, Pearson Education.
10. Physical Chemistry : P C Rakshit
11. Electrochemistry: Samuel Glasstone

## SEMESTER VI

### 6B16CHE PHYSICAL METHODS IN CHEMISTRY

**Credit-3**

**Contact hours-54**

#### **UNIT 1 Spectroscopy (15 Hours)**

Introduction: electromagnetic radiation, regions of the spectrum, interaction of electromagnetic radiation with molecules, Born-Oppenheimer approximation.

**Microwave Spectroscopy** – Rotation spectra-Instrumentation- Moment of inertia, Rotational Quantum numbers, Rotational Constant, Intensities of rotational spectral lines, Rotational – Vibrational Spectrum of diatomic molecules – Selection rules for rotational spectra.

**Infrared Spectroscopy** – Instrumentation -Theory of infrared spectra, Sampling techniques, Selection rule, Molecular vibration – Stretching and Bending modes, Calculation of stretching frequencies –Fundamental Bands and Overtones, Factors influencing vibrational frequency – Electronic effects, hydrogen bonding, solvent effect . Applications of IR Spectroscopy .

**UV Spectroscopy** –Absorption laws, Selection Rules – Types, Electronic transitions – Position and Intensity of absorption, Molar extinction coefficient, Chromophore – Auxochrome Concept, Absorption and Intensity Shifts, Types of Absorption Bands, Interpretations of spectra of simple conjugated dienes and enons, Woodward-Fieser Rule, Application to dienes and enons.

#### **UNIT 2 (15 Hrs)**

**Raman Spectroscopy** – Instrumentation, quantum theory of Raman scattering- Stokes and anti stokes lines-classical theory of

Raman scattering-concept of polarizability-selection rules,rule of mutual exclusion.

**NMR Spectroscopy** – Instrumentation- Introduction, Theory of NMR, Phenomena of resonance, Modes of nuclear spin-Relaxation Process, Chemical Shift – Internal standard,  $\delta$  and  $\tau$  scale, Shielding Effects, Factors affecting Chemical Shift, Spin-Spin interaction,

Interpretations of spectra of ethylbromide, ethanol, acetaldehyde, acetone, toluene, and acetophenone.

**Mass Spectrometry** – Basic principles, Instrumentation, Fragmentation pathway, Molecular

ion peak, base peak, Meta stable ion, General rules for predicting the prominent peaks, McLafferty Rearrangement, Mass spectra of alkanes, cyclo alkanes, saturated alcohols and aliphatic ketones.

### **UNIT 3 Instrumental Methods (11 hours)**

**Polarography** : Dropping Mercury Electrode, Polarization – Concentration polarization, Half wave Potential and Diffusion current (Significance), Ilkovic equation, Advantages of polarographic analysis – Applications.

**Amperometry** : Amperometric Titrations, Instrumentation- Procedure, Biamperometric Titrations – Advantages and disadvantages, Applications.

**Atomic Absorption Spectroscopy** : Flame Atomization and Flame Structure – Hollow Cathode lamp, Interference.

**Colorimetry and Spectrophotometry** : Instrumentation of photocolormeter and spectrophotometer-block diagrams with description of components-Beer- Lambert law – Application- and its limitations-Colorimetric Methods – general procedure for colorimetric determination.

### **UNIT 4 Molecular Symmetry and Group Theory (6 hrs)**

Symmetry of molecules-symmetry elements and symmetry operations – centre of symmetry, plane of symmetry, Identity – proper axis of rotation, improper axis of rotation – Schonflies notation – Point groups of simple molecules –  $C_{nv}$ ,  $C_{nh}$ ,  $H_2O$ ,  $NH_3$ ,  $N_2O_4$ ,  $N_2F_2$ .

### **UNIT 5 Concepts and Applications of Nano Science (7 hours)**

Introduction - Nanomaterials – synthesis – chemical precipitation, mechano-chemical method, micro emulsion method, reduction technique, chemical vapour deposition and sol-gel method (brief study)- Important methods for the characterization of nanomaterials – electron microscopy (SEM), transmission electron microscopy (TEM). Properties and applications of fullerenes - electrical and optical properties of carbon nanotubes(brief study).

## References

1. Physical Chemistry – A molecular Approach: Mc Quarrie, J. D. Simon, Viva Books Pvt Ltd.
2. Fundamentals of molecular spectroscopy: C. N. Baanwell and E M Mc Cash, TataMc GrawHill
3. A Textbook of Physical chemistry: K. L. Kapoor, Volume 4, Macmillan India Ltd.
4. Physical Chemistry, I. N. Levine, Tata Mc Graw Hill.
5. Elements of Physical chemistry: Puri, Sharma and Pathania, Vishal Publishing Co.
6. Physical Chemistry, K. J. Laidler, John H.Meiser.
7. Physical Chemistry : P.W. Atkins, Oxford University Press.
8. Electronic absorption spectroscopy and related techniques: D. N. Satyanarayana, Universities Press.
9. Nanosciece and nanotechnology: V. S. Muraleedharan and A. Subramania, Ane Books Pvt. Ltd.
10. Nano; The Essentials: T. Pradeep, Mc Graw-Hill education.
- 11 Symmetry and spectroscopy of molecules: K.Veera Reddy, New Age. International(P) Ltd

# SYLLABUS OF BSc CHEMISTRY PRACTICAL

## SEMESTER I & II

### CORE COURSE PRACTICAL I (1B02CHE & 2B02CHE)

#### Volumetric Analysis

72 hrs/ credit 3

#### Introduction to Volumetric analysis

Equivalent and molecular mass of compounds. Normality and Molarity -Primary standards. Preparation of standard solution - Principles of volumetric analysis. For acidimetry, alkalimetry and permanganometry two burette method may be used and for other volumetric analyses conventional methods can be used.

- 1 Acidimetry And Alkalimetry
  - a) Estimation of NaOH/KOH using standard  $\text{Na}_2\text{CO}_3$ .
  - b) Estimation of HCl/ $\text{H}_2\text{SO}_4$ / $\text{HNO}_3$  using standard oxalic acid.
- 2 Permanganometry
  - a. Estimation of oxalic acid.
  - b. Estimation of  $\text{Fe}^{2+}$
  - c. Estimation of Nitrite.
- 3 Dichrometry
  - a. Estimation of  $\text{Fe}^{2+}$  -using internal and external indicator
  - b. Estimation of  $\text{Fe}^{3+}$  - reduction by  $\text{SnCl}_2$  – internal indicator
- 4 Iodometry And Iodimetry
  - a. Estimation of  $\text{Cu}^{2+}$  /  $\text{CuSO}_4 \cdot \text{SH}_2\text{O}$ .
  - b. Estimation of potassium dichromate.
  - c. Estimation of  $\text{As}_2\text{O}_3/\text{As}^{3+}$
- 5 Precipitation titration-using adsorption indicators
  - a. Estimation of chloride in neutral medium
- 6 Complexometry
  - b. Estimation of  $\text{Mg}^{2+}$ ,  $\text{Zn}^{2+}$  and hardness of water

#### Inorganic Preparation

- c. Ferrous ammonium sulphate.
- d. Potash alum.
- e. Tetraammine copper(II) sulphate.
- f. Potassium trisoxalato chromate.

Prepare any one sample in the examination and exhibit the product.

## SEMESTER III& IV

### (3B05CHE & 4B05CHE) Inorganic Qualitative Analysis

Credit 3

72hrs

- 1 Systematic qualitative analysis of mixtures containing two anions by semi micro method. Study of the reactions of the following anions with a view to their identification, confirmation and procedure for elimination - carbonate, acetate, oxalate, fluoride, bromide, iodide, nitrate, sulphate, borate, phosphate, chromate, arsenate, arsenite. **One of the anion should be eliminating radical.**
- 2 Systematic qualitative analysis of mixture containing two cations by semimicro method. The cation mixtures may given as solution.

Study of the reaction of the following ions with a view to their identification and confirmation.

Lead, bismuth, copper, tin, iron, aluminum, zinc, manganese, cobalt, nickel, barium, strontium, calcium, magnesium,  $\text{NH}_4^+$

Note : minimum ten mixtures should be analyzed and recorded.

## SEMESTER V& VI

### 5B11 CHE & 6B11 CHE : GRAVIMETRIC ANALYSIS

Credit:3

#### Introduction to gravimetric techniques and its highlights.

1. Determination of water of hydration in crystalline barium Chloride.
2. Determination of barium as barium sulphate.
3. Determination of sulphate as barium sulphate.
4. Determination of iron as ferric oxide.
5. Determination of calcium as calcium carbonate.
6. Estimation of nickel as nickel dimethylglyoxime.
7. Determination of copper as cuprous thiocyanate.
8. Determination of magnesium as magnesium oxinate.

## SEMESTER V& VI

### 5B12 CHE & 6B12 CHE : ORGANIC CHEMISTRY

Credit:3

#### 1. Synthesis of Organic Compounds.

##### a. Aromatic electrophilic substitution:

###### Nitration

Preparation of dinitrobenzene from nitrobenzene.

Preparation of *p*-nitroacetanilide

###### Halogenation –

Preparation of *p*-bromoacetanilide.

preparation of 2, 4, 6 – tribromophenol.

##### b. Diazotization and coupling :

Preparation of phenyl azo  $\beta$ -naphthol.

Preparation of methyl orange.

##### c.Oxidation :

Preparation of benzoic acid from benzyl chloride or benzaldehyde



.

**d. Esterification :**

Benzoylation of phenol/aniline to phenyl benzoate.

**e. Hydrolysis :** Benzamide or ethylbenzoate to benzoic acid.

**2. Organic Qualitative Analysis**

a. Qualitative analyses with a view to characterize functional group/groups in the following compounds:

Naphthalene, anthracene, chlorobenzene, bromobenzene, benzyl chloride, *p*-dichlorobenzene, benzyl alcohol, phenol, cresols, naphthols, resorcinol, benzaldehyde, acetophenone, benzophenone, benzoic acid, phthalic acid, cinnamic acid, succinic acid, salicylic acid, ethyl benzoate, methyl salicylate, benzamide, urea, aniline, toluidines, dimethyl aniline, nitrobenzene, *o*-nitrotoluene, glucose, sucrose.

b. Preparation of derivatives.

*Note : Minimum ten compounds should be analyzed and recorded. For analysis, reactions may be carried out in tiles, wherever possible.*

**3. Thin layer Chromatography and Column Chromatography**

a. Preparation of the TLC plates – Checking the purity of the compounds by TLC – Acetylation of salicylic acid, aniline, Benzoylation of aniline and phenol, Determination of R<sub>f</sub> Values and identification of organic compounds by TLC, preparation and separation of 2, 4 –dinitrophenyl hydrazones of acetone and 2- butanone using toluene and light petroleum (40 :60).

b. Separation of ortho and para nitroaniline mixture by column chromatography.

4. **Demonstration Experiments** Steam distillation : Separation of ortho and para nitro phenols.

## SEMESTER VI

**CREDIT: 3**

**Hrs/week: 5**

## 6B18CHE `PHYSICAL CHEMISTRY

### 1: Cryoscopy Using Solid Solvent

a) Cryoscopic constant of solid solvent using a solute of known molar mass (cooling curve method)

Solid solvents/solutes given: Naphthalene, Biphenyl, diphenyl amine.

b) Molar mass of the given solute, using solvent of known  $K_f$ .

Solid solvents/solutes given: Naphthalene, Biphenyl, diphenyl amine.

### 2: Transition Experiments (cooling curve method)

a) Transition point, depression constant (KT) of the given Salt hydrate, using solute of known molar mass.

salt hydrates:  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$  /  $\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$ .

Solutes : Urea, Glucose,

b) Molar mass determination of given solute using salt hydrates of known (KT)

Salt hydrates and solutes as above

### 3: Phase Rule Experiments

#### Critical Solution Temperature (C.S.T)

a) Critical solution temperature of phenol – water system

b) Concentration (% composition) of NaCl/KCl by C.S.T Measurements

### 4. Conductometry

Conductometric titrations

a) Strong acid x strong base

b) Weak acid x strong base

### 5 : Potentiometry

Potentiometric titrations

a) Acid base titration (Strong acid, strong base)

### 6 : Distribution Law

Partition coefficient of  $\text{I}_2$  between  $\text{CCl}_4$  and  $\text{H}_2\text{O}$

### 7. colorimetry

Verification of Beer-Lambert law for  $\text{KMnO}_4$ , determination of the concentration of the given solution.

## **8. Chemical Kinetics** – Hydrolysis of methyl acetate using HCl acid.

### **Note:**

1. A minimum number of 8 experiment should be done
2. Electronic balance may be used for practical work.

### **VIVA VOCE**

Viva voce examination based on practical will be conducted along with every practical examination.

### **REFERENCES**

1. A.I.Vogel - A Text Book of Qualitative Analysis including semi-micro methods
2. V.V.Ramanujan – Semi micro Qualitative Analysis.
3. A.I.Vogel – A Text Book of Quantitative Inorganic Analysis.
4. A.I.Vogel - Elementary Practical Organic Chemistry.
5. A.O.Thomas – Practical Chemistry for B.Sc Chemistry.
6. A Findlay – Practical Physical Chemistry.
7. R.C.Das & E Behara – Experimental Physical Chemistry.
8. N.K.Vishnoi – Advanced Practical Chemistry.
9. Y.B. Yadav, Practical Physical Chemistry.

### **STUDY TOUR**

Students are required to visit at least one Laboratory/factory/Research Institute of eminence during the course and submit the Study tour report separately along with practical records at the time of practical Exam (6<sup>th</sup> Semester).

### **PROJECT REPORT:**

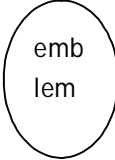
Students should undertake a group project work related to chemistry and submit the report along with practical records during VI semester practical. (Guide lines for evaluation given in Annexure I)

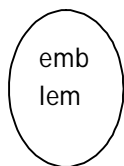
#### **General Guidelines of Project Work**

1. Students should undertake the project work related to Chemistry only.
2. The UG level project work is a group activity, maximum number of students being limited to five. However each student should prepare and submit the project report separate.

- 3 The matter should be typed on A-4 size paper with Times New Roman font of size 12 points, with double spacing between the lines and margins of 1.5' at the left, 1' at the right, 1' each at the top and bottom.
- 4 The report should be printed in plain white paper in black ink only. Color inks for charts and graphs can be used, provided it does not hamper the readability. The logo of the college can be displayed in the report.
- 5 The project report should be hard bound/ spiral bound / paper back.

### **Format of the Project Report**

|                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Title</b></p><br><br> <p><b>Name of the student</b></p> <p><b>Department</b></p> <p><b>College</b></p> <p><b>Month &amp; Year</b></p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



**Project Report**

**Submitted to Kannur University in partial fulfillment**

**for the B.Sc Degree (Chemistry)**

**By**

**Name of the student**

**Reg. No.**

**Name & Designation Project Guide:**

**Signature Name and Designation**

**of Head of the Dept.**

**Examiners:**

**1.**

**2.**

Page I : Certificate (By Project Guide)

Page 2. Declaration (By Student)

Page 3. Acknowledgement

Page 4 . Contents

Chapter I : Introduction

Chapter II : Aim of the project/Problem Statement

Chapter III : Review

Chapter IV : The Study/Present work

Chapter V : Data Analysis/ Discussion

Chapter VI :Conclusion

Bibliography

## MODEL QUESTION PAPERS FOR PRACTICALS

### B.Sc CHEMISTRY PRACTICAL EXAMINATION

#### SEMESTER 11- 1B02CHE & 2B02CHE

#### Volumetric Analysis

**Time : 4 Hours**

**Maximum marks:40**

**Credit : 3**

Instruction : candidate should submit bonafide record at the time of examination

1. Write down the Principle for the estimation of .....given  
.....
2. Calculate the weight of ..... required for the preparation of  
.....N,.....ml solution.
3. Estimate the amount of ..... in the whole of the given solution provided with  
.....solution and .....crystals.
4. Prepare the Inorganic complex..... Recrystallize and exhibit both crude and  
recrystallized samples.
5. Viva Voce

\*\*\*\*\*

**SEMESTER IV 3B05CHE & 4B05CHE**

**PRACTICAL II : INORGANIC**

**QUALITATIVE ANALYSIS**

**Time:4Hours**

**Maximum Marks:40**

**Credit: 3**

Instruction : candidate should submit bonafide record at the time of examination

1. Analyse systematically the given mixture containing the anions and cations by semi-micro method.
2. Viva Voce.



**SEMESTER VI 5B11CHE & 6B11CHE**

**PRACTICAL III : \*GRAVIMETRIC ANALYSIS**

**Time : 3 Hours**

**Maximum Marks:40**

**Credit: 3**

- 1 Write a brief outline of the procedure for the gravimetric estimation of .....  
.....in the solution.....
- 2 Estimate gravimetrically the amount of .....in the whole of the  
given..... Solution.
- 3 Viva Voce

**SEMESTER VI 5B12CHE & 6B12CHE**

**PRACTICAL IV:\*ORGANICCHEMISTRY**

**Time : 3 Hours**

**Maximum Marks:40**

**Credit: 3**

1. Write down the procedure for the preparation of.....from.....
2. Analyse systematically the given organic compound with a view to identify the functional group present in it and submit a report of the procedure adopted. Suggest a suitable solid derivative for the compound and write the procedure for its preparation..
3. Convert the given .....into.....Recrystallise and exhibit both crude and recrystallised samples.
4. Viva Voce.

**\*Practical paper III & paper IV are to be conducted in the sixth semester for 6hrs on the second day.**

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## SEMESTER VI

### PRACTICAL V : 6B18CHE PHYSICAL C HEMISTRY

**Time : 4 Hours**

**Credit : 3**

Instruction : Candidate should submit bonafide record at the time of examination.

Attempt the question marked **X**

1. Determine the molecular mass of the given solute B by cryoscopic method.  $K_f$  of solid solvent A is ----- . Conduct a duplicate experiment.
2. Determine the rate constant for the hydrolysis of the given ester in the presence of the given acid. Calculate 5 k values. Obtain k value graphically.
3. Determine the Cryoscopic constant of the given solid solvent A using solute B of molecular mass----- . Conduct a duplicate experiment.
4. Determine the mass of HCl in the given solution conductometrically.
5. Write down the procedure for the experiment marked X within first 5 minutes.
6. Submit the Project Report & Report of Industrial visit.
7. VIVA VOCE

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# **KANNUR UNIVERSITY**

**SYLLABUS**

## **CHEMISTRY – ELECTIVE COURSES**

**With effect from 2014 Admission**

**UNDER**

**CHOICE BASED CREDIT SEMESTER SYSTEM**

**SEMESTER VI**  
**6B17CHE–A. ENVIRONMENTAL CHEMISTRY**

Credits : 3

Total Contact Hrs : 54

**OBJECTIVES:**

1. To create awareness about the environmental issues
2. To make students capable of analyzing the environmental problems and help the public to take the correct stand
3. To impart knowledge about modern techniques for analyzing environmental pollutants.

**1. Environmental segments**

**(10 hours)**

Environmental segments: Lithosphere, Hydrosphere, Atmosphere and Biosphere. Primary and secondary pollutants. Atmospheric temperature and composition at different regions. Percentage composition of waters and water cycle. Soil – factors affecting soil formation, components of soil and soil layers.

Chemical Toxicology – Toxic chemicals in environment – Sources, effects and treatment of heavy metal poisoning – Pb, As, Cd, Hg, Cr, Cu & Co. Minamata and Itai-Itai diseases.

**2. Air Pollution**

**(12 hours)**

Air pollution – Air pollutants –CO, NO<sub>x</sub>, SO<sub>2</sub>, H<sub>2</sub>S, Hydrocarbons, particulate matter. Acid rain and its effects.

Green house effect and global warming – climate change – ozone chemistry and ozone hole- chlorofluorocarbons, dioxins. Photochemical smog (reactions) – El Nino phenomenon. Bhopal gas tragedy.

Sampling – monitoring of air pollutants – Analysis of CO, NO<sub>x</sub>, SO<sub>2</sub>, H<sub>2</sub>S, Hydrocarbons and particulates. Control of air pollution – control by devices – Stacks, filters, electrostatic precipitators, cyclone separators, scrubbers and catalytic converters.

### **3. Water pollution**

**(12 hours)**

Water resources, - water pollution – sources – Industrial effluents – agriculture discharge – oil spills – heavy metals – pesticides – detergents

Eutrophication – biomagnifications and bioaccumulation – experimental determination of Dissolved oxygen, BOD and COD – Thermal Pollution – Control of water pollution – ISI/BSI standards of drinking water. Hardness of water – causes and effects – methods of estimation – removal of hardness. Domestic water treatment – Sewage – Sewage analysis - Sewage treatment.

### **4. Soil Pollution**

**(10 hours)**

Lithosphere – soil formation – components of soils – Acid base and ion exchange reactions in soil – soil pollution – soil acidification – effects on plants – liming of soil – Industrial and urban wastes – plastics, pesticides and heavy metals in soil – garbage – biomedical waste – E waste –Municipal Solid waste management. Bioremediation.

### **5. Noise and Radiation pollution**

**(10 hours)**

Noise pollution and Radioactive Pollution : Human acoustics - Noise – general features - types of Noise – Measurement of noise – sound pressure and power levels – sources and effects of noise pollution – prevention of hearing loss in industry – control of noise pollution.

Radiation chemistry – Man made and natural radiations – biological effects of radiation – radiation hazards from reactors – radioactive waste management.

### **References:-**

1. Environmental Chemistry, A.K.De.
2. Environmental Chemistry, P.S. Sindhu
3. Environmental Chemistry, B. K. Sharma
4. Essentials of environmental studies, S.P. Misra & S.N.Pandey
5. Advanced Inorganic Chemistry Vol. II, Gurdeep Raj
6. Engineering Chemistry, Dr. B.K. Sharma
7. Engineering Chemistry, Jain & Jain, Dhanpat Rai Publishing Company
8. A Basic course in environmental studies, Surinder Deswal & Anupama Deswal.

**SEMESTER VI**  
**6B17CHE–B. APPLIED CHEMISTRY**

Credits :3

Total Contact Hrs : 54

**OBJECTIVES:**

- 1 To create interest in application side of chemistry
- 2 To have awareness about daily and simple applications of chemistry daily life.
- 3 To impart idea about smart materials used in these smart world.

**1. Water Chemistry**

**(12 hours)**

Water sources – specifications for water- impurities in water- characteristics imparted by impurities – Hardness – Disadvantages of hard water in domestic and industrial use. Softening methods-lime soda, zeolite and ion exchange methods (principle only)-Drinking water or municipal water- methods of purification- removal of suspended impurities, micro organisms- Desalination of brackish water-electro dialysis, reverse osmosis-Importance of dissolved oxygen, BOD & COD-Municipal Sewage treatment.

**2. Fertilizer and Pesticide Chemistry**

**(14 hours)**

Pesticides – Classification – Chemistry of chlorinated organic compounds – Polychlorinated biphenyles – pesticides interfering with respiration – Lindane – polychlorinated cyclopentadiene derivatives – Auxins herbicides – long term effects of organochlorocompounds – organophosphorous pesticides – Carbamates – Use of Pheramones and hormones – insect sterilization – color coding of pesticides – Handling of pesticides. Fertilizers- natural, synthetic, mixed, NPK fertilizers.

**3. Food Chemistry**

**(16 hours)**

Classification – Lipid oxidation: autoxidation and metal catalyzed oxidation – Acid value – Rancidity in fats and oils – iodine value. Nutritional role of carbohydrates – effect of sugar on health – carbohydrate metabolism

Amino acids – classification- peptides and proteins- biomedical importance of peptides- functions and properties of peptides- denaturation and oxidation- classification of proteins- structure of proteins

Vitamins – Classifications, sources, biochemical functions and deficiency symptoms of vitamin A, B<sub>1</sub>, B<sub>2</sub>, B<sub>12</sub>, C, D, E and K.

Food additives – preservatives, saccharin, aspartame. Harmful effects of food additives. Chemicals present in Soft drinks and their effects.

#### **4. Smart Materials**

**(12 hours)**

Shape memory alloys, Piezoelectric materials, Electrostrictive and Magnetostrictive materials, Thermochromic and photochromic, pH-sensitive Polymers, Halochromic materials, Photomechanical materials, Self-healing materials, Smart fabrics, Magnetic shape memory and Thermoelectric materials with examples. Nano devices.

#### **References:**

1. Engineering Chemistry, Jain & Jain, Dhanpat Rai Publishing Company
2. Food chemistry – H K Chopra and P S Panesar – Narosa Publishing House
3. The Chemistry of life – Harris L J – Cambridge University Press, New York
4. Organic Chemistry – Vol I and II , I L.Finar
5. Buchel, K.H. Chemistry of Pesticides, John Wiley & Sons, New York, 1983
6. P.C Pall, K. Goel, R.K Gupta, Insecticides, pesticides and agrobased industries
7. Smart materials, M.V. Gandhi, Brian S. Thompson, Champan and hall.
8. Engineering Analysis of Smart Material Systems, Donald J. Leo, John Wiley & Sons, New York

**SEMESTER VI**  
**6B17CHE–C. POLYMER CHEMISTRY**

Credits :3

Total Contact Hrs : 54

**OBJECTIVES:**

- 1 To know about types of polymers and polymerization techniques
- 2 To have knowledge about individual polymers.
- 3 To have an idea about the recent advances in polymer science.

**1. Introduction.**

**(16 hours)**

Monomer & polymer, definition. Classification - natural, synthetic & semisynthetic, condensation & addition polymers, Homo polymers, copolymers, branched and crosslinked polymers, graft and block copolymers, composites, blends, elastomers, fibres, plastics, thermoplastic and thermosetting polymers. Tacticity in polymers-Isotactic, syndiotactic and atactic polymers. Properties: Glass transition temperature (T<sub>g</sub>) - Definition- Factors affecting T<sub>g</sub> - relationships between T<sub>g</sub> and molecular weight and melting point. Importance of T<sub>g</sub>.

**2. Plastics, rubbers and fibres.**

**(14 hours)**

Preparation properties and applications of - Plastics: Polyethylene, Polyvinylchloride, polymethyl methacrylate PMMA, polyethylene terphthalate PET, Teflon, Bakelite.  
Rubbers: natural and synthetic rubbers - styrenebutadienerubber SBR, polybutadiene, polyisobutylene, butyl rubber, nitrile rubber, BUNA-S, BUNA N, neoprene rubber.  
Synthetic fibres : Nylon 66, Nylon 6, Rayon.

**3. Polymerisation Techniques**

**(14 hours)**

Types of polymerization- addition (initiation, propagation and termination), condensation, ionic (cationic & anionic), Ring opening polymerizations (epoxy resins) coordination polymerization – Ziegler Natta catalyst

moulding of plastics into articles- compression moulding-injection moulding-blow moulding—extrusion moulding



#### 4. Advances in Polymers

(10 hours)

Biopolymers - biodegradable polymers, Polymers in medical field. High temperature and fire-resistant polymers. Conducting polymers PAC, PPP, PPY etc -

Polymers used as adhesive and coatings, liquid crystalline polymers, Vulcanization of rubber.

Environmental Hazards of plastics and recycling

#### References:

1. V.R. Gowariker, N.V. Viswanathan and Sreedhar, *Polymer Science*, Wiley Eastern Ltd.
2. F.W. Billmeyer, *A text book of polymer science*, John Wiley & Sons, 1971.
3. Maurice Morten, *Rubber Technology*, Van Nostrand, Reinold, New York.
4. S. Paul, *Surface Coatings*.
5. B.K. Sharma, *Polymer Chemistry*, Goel Publishing House, Meerut.
6. M. Jenkins, *Biomedical Polymers*, University Birmingham, U.K.
7. M.G. Arora, M. Singh and M.S. Yadav, *Polymer Chemistry*, 2nd Revised edition, Anmol Publications Private Ltd.

**Credit: 3****Contact hours: 54 Hrs**

OBJECTIVES:

1. For creating awareness in the field of nano particles
2. To perform a range of activities related to Nanoscience and Nanotechnology
3. To create idea about recent advances in nanotechnology

**1. Introduction****(10 hours)**

Nanotechnology- Defenition, History- Timeline and Milestones, Classification based on dimensions (0D, 1D, 2D, 3D) and commercial use (carbon based, metal based, composites, dendrimers), Nanofabrication- “Top-Down” and “Bottom-Up” approaches.

**2. Nano Synthesis****(16 hours)**

Top-down techniques: photolithography, other optical lithography (EUV, X-Ray, LIL), particle-beam lithographies (e-beam, FIB, shadow mask evaporation), probe lithographies, Bottom-up techniques: self-assembly, self-assembled monolayers, directed assembly, layer-by-layer assembly. Chemical Routes for Synthesis of Nanomaterials: Chemical precipitation and co-precipitation; Metal nanocrystals by reduction, Sol-gel synthesis; Microemulsions or reverse micelles, myle formation; Solvothermal synthesis; Thermolysis routes, Microwave heating synthesis; Sonochemical synthesis; Electrochemical synthesis; Photochemical synthesis, Synthesis in supercritical fluids.

**3. Nanomaterial Characterizations****(14 hours)**

Characterization Techniques: Compositional surface analysis: XPS, SIMS. Microscopies: optical microscopy, fluorescence and confocal microscopy, TEM, SEM, Probe techniques: Scanning tunneling microscopy (STM), Atomic force microscopy (AFM), Scanning Nearfield Optical Microscopy SNOM, Scanning Ion Conducting Microscopy (SICM). Ellipsometry, Neutron Scattering and XRD, Spectroscopic Techniques: UV-visible, FT-IR, Raman, NMR, ESR.

**4. Applications of Nanomaterials****(14 hours)**

Solar energy conversion, storage and catalysis. Nanoelectronics, nanosensors, nanobiotechnology, computational nanotechnology, Nanomagnetism, Nanodevices, Spintronics, selfcleaning nanoparticles. Nanomaterials in electronics, robotics, computers, sports equipment, mobile electronic devices and cosmetics. Medical applications of nanomaterials.

**References:**

1. G.L.Hornyak, J.Dutta, H.F.Tibbals, A.K.Rao, Introduction to Nanoscience, CRC Press, 2008, ISBN: 978-1-4200-4805-6
2. A.Nabok, *Organic and Inorganic Nanostructures*, Artech House 2005
3. C.Dupas, P.Houdy, M.Lahmani, *Nanoscience: Nanotechnologies and Nanophysics*, Springer-Verlag Berlin Heidelberg 2007
4. Hari Singh Nalwa, *Nanostructured Materials and Nanotechnology*, Academic Press, 2002
5. Nanotechnology- Richard Brooker, EARL Boyson- Wiley Dream Tech India
6. Advances in Nanoscience and Nanotechnology- Dr.Ashuthosh Sharma, Dr.Bellari- CSIR Publication 2004
7. Nanotechnology(Malayalam) – Anwar Sadath- DC Books
8. Nanochemistry: A Chemical Approach to Nanomaterials – Royal Society of Chemistry, Cambridge, UK 2005.
9. Chemistry of nanomaterials : Synthesis, properties and applications by CNR Rao et.al.
10. ‘Handbook of Theoretical and Computational Nanotechnology, Eds. Michael Rieth and Wolfram Schommers, 2006.
11. ‘Handbook of Theoretical and Computational Nanotechnology, Eds. Michael Rieth and Wolfram Schommers, 2006.
12. Nanotubes and Nanowires- CNR Rao and A Govindaraj RCS Publishing.
13. Concepts in Spintronics – Sadamichi Maekawa
14. Spin Electronics – David Awschalom

# **KANNUR UNIVERSITY**

**SYLLABUS**

**CHEMISTRY – OPEN COURSE**

**With effect from 2014 Admission**

**UNDER**

**CHOICE BASED CREDIT SEMESTER SYSTEM**

**OPEN COURSE**  
**SEMESTER V**  
**5D01CHE : CHEMISTRY IN SERVICE TO MAN**

**Credit:2**

**Contact hours:36 Hrs**

**Aim: To create interest in studying the role of chemistry in overall development**

**Objectives:**

- 1. To provide knowledge about the structure, properties and uses of plastics & polymers**
- 2. To provide a brief idea about the role of chemistry in industry and agriculture**
- 3. To make aware about the use and abuse of chemicals in daily life**
- 4. To study about the chemistry of medicines**
- 5. To provide knowledge about adverse effects in using polluted water and methods of treatment**

### **1. PLASTICS & POLYMERS**

Polymers- Types of polymers natural & synthetic polymers-characteristics and examples. General characteristics and applications of polymers such as Polythene (LDPE & HDPE), polypropylene, PVC, Poly styrene, Poly vinyl acetate, PET, Teflon, Terrylene, Nylons (Nylon 6, Nylon 66 & Kevlar), PMMA and Bakelite. Artificial fibers -examples

Plastics- Thermoplastics and thermosetting plastics- Characteristics and examples.. Elastomers Natural and synthetic rubbers-Vulcanization, Characteristics and uses of Buna, Butyl, Chloroprene, SBR, Silicone & Thiokol rubbers. Biodegradable polymers .examples. benefits of biodegradable plastics. Importance of plastic recycling.

**6 Hours**

### **2. FERTILIZERS & INSECTICIDES**

Natural, synthetic mixed and NPK fertilizers – examples.- making of NPK mixture - Impact of excessive use of fertilizers on environment – Bio fertilizers – plant growth hormones. Pesticides and their classification- examples. Excessive use of pesticides. Environmental hazards. Safe handling of pesticides. Insect repellants- Pheromones

**5 Hours**

### **3. FUELS, CELLS & BATTERIES**

Definition and classification of fuels – Characteristics of good fuel – Combustion - Calorific value – wood- coal – origin of coal- - petroleum-origin –fractional distillation –different fractions, their composition & uses. Natural gas, Biogas & LPG – their composition and uses.

Pollution due to burning of fossil fuel Batteries and fuel cells – Different types – Applications in modern life.

**5 Hours**

#### **4 CEMENT &GLASS**

Cement- Classification – Portland cement – Raw materials – manufacture – setting and hardening – Glass – Different types – manufacture – raw materials – manufacture of ordinary glass – annealing.

**3 Hours**

#### **5. COSMETICS**

Cosmetics – Cleansing cream, cold cream, bleaching & vanishing creams, perfumes, talcum powder, tooth paste, deodorants, lipstick – ingredients. Harmful chemicals in cosmetics

**3 Hours**

#### **6 MEDICINES**

Drugs- classification- Sulpha drugs - mode of actions, examples and uses. Antibiotics- Discovery, examples and importance. Misuse of antibiotics.

Antipyretics, analgesics and anti-inflammatory agents, narcotic analgesics Anesthetic, Antiseptic, Anti histamines and tranquillizers, - examples, and abuse. Disinfectant & germicides examples, importance and uses.

**6 Hours**

#### **7. WATER TREATMENT**

Water sources – specifications for water- impurities in water- characteristics imparted by impurities – Hardness – Disadvantages of hard water in domestic and industrial use

Softening methods-lime soda, zeolite and ion exchange methods(principle only)- Drinking water or municipal water- methods of purification- removal of micro organisms- Desalination of brackish water-electro dialysis, reverse osmosis- Importance of dissolved oxygen, BOD & COD-Municipal Sewage treatment

**8 Hours**

## References:-

1. J Barrett: Chemistry in your environment-User friendly, Simplified Science.
2. Howard L White: Introduction to Industrial Chemistry
3. David M Targarden: Polymer Chemistry – Introduction to an indispensable science.
4. M.S.Yadav: Synthetic drugs
5. Samuel Delvin: Dyes and Pigments
6. Alexander Findlay: Chemistry in the service of man
7. S. K Honda: Principle of pesticide chemistry
8. M.M.Chakrabarthy: Chemistry and Technology of oils and fats
9. Shalini Sareen: Chemotherapeutic agents
10. P.K.Ray: Pollution and health
11. Vanessa Good ship: Introduction to plastic recycling
- 12.Randy Schmetter and Perry Romanowski: Beginning cosmetic chemistry.
13. V Jain: Organic polymer chemistry
- 14.V K Selva raj: Advanced polymer chemistry
15. Jr Charles E Carraher: Introduction to polymer chemistry
16. Shashi Chawla: A Text Book of Engineering Chemistry
17. Jain & Jain : Engineering Chemistry

## SEMESTER V

### 5D02 CHE DRUGS – USE & ABUSE

**Credit:2**

**Contact hours:36 Hrs**

#### **Objectives:**

1. Impart Knowledge regarding the history, classification uses of different drugs.
2. To provide a brief idea about the mode of action of drugs
3. To make the students aware about the side effects of modern drugs.
4. To create awareness regarding the misuse of drugs and its harmful effects.

#### **INTRODUCTION**

Drugs- Definitions, Classifications and examples of drugs- Routes of drug administrations,

Enteral, parenteral and topical routes. Bioavailability of drugs -Advantage and disadvantage of various routes of administrations

**5 Hrs**

#### **PHARMACOKINETICS and PHARMACO DYNAMICS**

Definition of Pharmacokinetics- A brief explanation of Absorption, Distribution-Metabolism (Biotransformation) and Excretion . First pass metabolism

Definition of Pharmacodynamics- Modes of drug action, Receptors- Agonist ,Antagonist and Inverse agonists. Types of receptors (Brief explanation of types of receptors ) , Dose response relationship ,Lethal Dose , EC 50 or ED 50 Therapeutic index , Types of Drug interactions , Drug tolerance, Placebo , Adverse drug reactions –

**10 Hrs**

#### **SYNTHETIC DRUGS**

Examples of Antipyretics , analgesics and anti inflammatory agents . A brief explanation of their mode of action . Antibiotics- Discovery and its importance. Examples of antibiotics – Antibiotic misuse .Antihistamines- examples , Anaesthetics , anti malarial, Diuretics and anti- ulcer drugs . Chemotherapy

Drugs acting on Central Nervous System, Drugs acting on Peripheral Nervous System . Cardiovascular drugs classification and examples.

**8 Hrs**



## **MISCELLANEOUS DRUGS**

Antiseptics and disinfectants, Vaccines, chelating agents, Vitamins and Minerals, Enzymes and Hormones, Treatment in poisoning.

**6Hrs**

## **DRUGS OF ABUSE:-**

Classification of drugs of abuse –Narcotic analgesic CNS Stimulants examples and effects, Depressants, Hallucinogens examples and effects, Sedatives, hypnotics example and effects ,Opioids, Cannabis and Inhalants examples and effects . Drug dependence, withdrawal symptoms , tolerance and addiction.

**7 Hrs**

## **References**

1. Drugs – G.L. David Kurupadanam, Vijayaprasad, K. Varahiipatrasad Rao et.al.
2. Medical Pharmacology- Padmaja Udayakumar
3. Essentials of Medicinal Pharmacology - Tripathi
4. Medicinal Chemistry – Ashuthosh Kar
5. Dispensing Pharmacy – Kapoor & Gunn
6. A Text Book of Forensic Pharmacy – B.M. Mithal.
7. A Text Book of Organic and Pharmaceutical Chemistry - Wilson & Gisvold

## SEMESTER V

### 5D03 CHE : ENVIRONMENTAL STUDIES

**Credit:2**

**Contact hours:36 Hrs**

**Aim:** To study about the environment, pollutants ,their effects and control measures

**Objectives:**

1. To provide knowledge about the environmental segments,their structure and composition.
2. To create awareness regarding the source, effects and sink of pollutants in the environment.
3. To study about the energy recourses, the role of fuel consumption in environmental pollution,  
importance of energy management and search for eco-friendly and non-conventional energy sources.
- 4.To inculcate among the students importance of environmental protection, & environment friendly life style for a better living and better future

#### **UNIT I.**

Environmental segments – Lithosphere: soil formation – components of soils. Hydrosphere: Hydrological cycle , water and river water composition. Fresh water –surface water and ground water.- Biosphere- Atmosphere.- regions of Atmosphere- temperature and composition in different regions – Troposphere, stratosphere, Mesosphere, Thermosphere.

**6 Hours**

#### **UNIT II**

Air pollution –Sources – pollutants –CO, NO<sub>x</sub>, Sox, Hydrocarbons, Particulates. Effect on ecosystem., Ozone layer –importance, Ozone depletion-Control measures- Acid rain-control of acid rain- Green house effect-global warming,-photochemical smog- effect pollution on plants and human beings. Control of air pollution Noise Pollution – physiological response to noise, Noise categories- effect of noise – biological effects.

**6 hours**

#### **UNIT III**

Water Pollution – Sources –Industrial effluents- agriculture discharge - oil spills-heavy metal -pesticides-biomagnifications and bioaccumulations-Experimental determination of dissolved oxygen in water, chemical oxygen demand (COD) and bio chemical oxygen

demand(BOD)- control of water pollution- ISI/BIS standards of drinking water.

**6hours**

#### **UNIT IV**

Soil Pollution - Sources by industrial and urban wastes, radioactive pollutants, plastics heavy metals. Poisoning by heavy metals – Mina- matha & itai-Itai diseases. Control of soil pollution.- Solid waste Management -Thermal pollution definition-sources of thermal pollution , harmful effect of thermal pollution prevention of thermal pollution.

**6 hours**

#### **UNIT V**

Sources of energy- fossil fuels, nuclear fission- Solar energy – use of solar energy in space-heating and water heating.- Production of electricity using solar energy. Solar trough collections- solar pond solar energy for driving vehicles, Power from indirect solar energy – Hydro power- wind power- Biomass energy.

**6hours**

#### **UNIT VI**

Environment and public health- climate and health-Hazardous products – occupational hazards -infectious diseases- water borne diseases, vector borne diseases -Risks due to chemicals in food, cancer and environment.

Biotechnology and its application in environmental protection - biological de-odourisation, biological purification of contaminated air.

**6 Hours**

#### **References:**

1. Text book of Environmental Studies for under graduate courses – Erach Bharucha
2. Essential Environmental studies- S. P. Misra – S. N. Pandey
3. Environmental chemistry and pollution control – S.S Dara (2<sup>nd</sup> edition)
4. Environmental chemistry- Peter O' Neill
5. Environmental chemistry – B.K. Sharma
6. Fundamental concepts of environmental chemistry – G.S Sodhi
7. Environmental Chemistry. A.K De

## 5D04CHE – NANOMATERIALS

**Credit:2**

**Contact hours:36 Hrs**

Aim: To Understand the fundamentals of Nano Science and Technology

### **Objectives:**

1. To make an objective judgment of the scientific importance and technological potential of developments in micro- and nanotechnologies.
2. To perform a range of activities related to Nanoscience and Nanotechnology
3. To prepare the student to take the challenge of meeting national needs and international needs

### **UNIT 1. Definition and Scope of Nano Science**

**7 Hrs**

Nanotechnology- Definition, History-Timeline and Milestones, Overview of different nanomaterials available, Potential uses of nanomaterials in electronics, robotics, computers, sensors in textiles, sports equipment, mobile electronic devices, vehicles and transportation. Medical applications of nanomaterials.

### **UNIT 2. Nano Chemistry**

**10Hrs**

Novel physical chemistry related to nanoparticles such as colloids and clusters: different equilibrium structures, quantum effects, conductivity and enhanced catalytic activity compared to the same materials in the macroscopic state. Exploitation of self-assembly and self-organization to design functional structures in 1D, 2D or 3D structures. Examples to emphasize on self-assembled monolayers.

### **UNIT 3 Synthesis of Nanomaterials**

**12Hrs**

Nanomaterials (Nanoparticles, nanoclusters, quantum dots synthesis): Preparation and Characterization: “Top-Down” and “Bottom-Up” approaches of nanomaterial (nanoparticles, nanoclusters and quantum dots)

synthesis: Chemical Routes for Synthesis of Nanomaterials: Chemical precipitation and co-precipitation; Metal nanocrystals by reduction, Sol-gel synthesis; Solvothermal synthesis;

Thermolysis routes, Microwave heating synthesis; Sonochemical synthesis; Electrochemical synthesis; , Photochemical synthesis, Synthesis in supercritical fluids, current state-of-the-art

#### **UNIT 4 Applications of Nanomaterials**

**7Hrs**

Solar energy conversion, storage and catalysis. Nanoelectronics, nanosensors, nanomedicine, nanobiotechnology, computational nanotechnology, Nanomagnetism, Carbon Nanotubes , Nanodevices, Spintronics, self cleaning nanoparticles.

#### **References:**

1. G.L.Hornyak, J.Dutta, H.F.Tibbals, A.K.Rao, Introduction to Nanoscience, CRC Press, 2008.
2. A.Nabok, *Organic and Inorganic Nanostructures*, Artech House 2005.
3. C.Dupas, P.Houdy, M.Lahmani, *Nanoscience: Nanotechnologies and Nanophysics*, Springer-Verlag Berlin Heidelberg 2007
4. Hari Singh Nalwa, *Nanostructured Materials and Nanotechnology*, Academic Press, 2002
5. Nanotechnology- Richard Brooker, EARL Boyson- Wiley Dream Tech India
6. Advances in Nanoscience and Nanotechnology- Dr.Ashuthosh Sharma, Dr.Bellari- CSIR Publication 2004
7. Nanotechnology (Malayalam) – Anwar Sadath- DC Books
8. Nanochemistry: A Chemical Approach to Nanomaterials – Royal Society of Chemistry, Cambridge, UK 2005.
9. Chemistry of nanomaterials : Synthesis, properties and applications by CNR Rao et.al.
10. 'Handbook of Theoretical and Computational Nanotechnology, Eds. Michael Rieth.

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# **KANNUR UNIVERSITY**

## **SYLLABUS**

### **CHEMISTRY – COMPLEMENTARY COURSE**

**With effect from 2014 Admission**

**UNDER**

**CHOICE BASED CREDIT SEMESTER SYSTEM**

**Scheme--- Complementary Course ( Chemistry)**

| No | Semester        | Course code | Title of the course                               | Contact hour/ week | Credit |
|----|-----------------|-------------|---------------------------------------------------|--------------------|--------|
| 1  | I               | 1C01CHE     | Chemistry<br>(For Physical & Biological Sciences) | 2                  | 2      |
| 2  | II              | 2C02CHE     | Chemistry<br>(For Physical & Biological Sciences) | 2                  | 2      |
| 3  | III             | 3C03CHE(BS) | Chemistry (For Biological Science)                | 3                  | 2      |
| 4  | III             | 3C03CHE(PS) | Chemistry (For Physical Science)                  | 3                  | 2      |
| 5  | IV              | 4C04CHE(BS) | Chemistry (For Biological Science)                | 3                  | 2      |
| 6  | IV              | 4C04CHE(PS) | Chemistry (For Physical Science)                  | 3                  | 2      |
| 5  | I,II,<br>III&IV | 4C05CHE*    | Complementary Chemistry practical                 | 2                  | 4      |

\* External examination will be conducted at the end of IV semester.

## SEMESTER I

### 1C01CHE- CHEMISTRY For Physical & Biological Sciences

2Hrs/week

Contact Hrs –36

Credit -2

#### UNIT I : Atomic Structure and Periodic Table (10 hrs)

Bohr atom Model (No derivation) – Atomic Spectra – limitations – wave mechanical concept of atom – Heisenberg's Uncertainty Principle – Dual nature of electrons – De Broglie equation – quantum numbers. Orbit and orbitals – Schrodinger equation (no derivation). The periodic table – periods and groups-s, p, d and f block elements – modern concept – periodic trends – atomic radii, ionic radii & covalent radii – effective nuclear charge and screening effect – Ionization potential – electro negativity and electron affinity.

#### UNIT II : Chemical bonding (10 hrs)

Ionic, covalent and co-ordinate bonds. Lattice energy of ionic compounds – Born Haber cycle. VSEPR theory and its applications. Shape of molecules  $\text{CO}_2$ ,  $\text{BeF}_2$ ,  $\text{BF}_3$ ,  $\text{CH}_4$ ,  $\text{NH}_3$ ,  $\text{H}_2\text{O}$ ,  $\text{NH}_4^+$ ,  $\text{PCl}_5$ ,  $\text{SF}_6$ ,  $\text{ClF}_3$ . Orbital overlapping – Hybridization  $sp$ ,  $sp^2$ ,  $sp^3$ ,  $sp^3d$ ,  $sp^3d^2$ ,  $d^2sp^3$  and  $dsp^2$  hybridization. V.B Theory. MO theory. Formation of  $\text{B}_2$ ,  $\text{C}_2$ ,  $\text{N}_2$  and  $\text{O}_2$  molecules. Hydrogen bonding, types of hydrogen bonding – example

#### UNIT III : Environmental Chemistry (10 hrs.)

Introduction-environment and segments- Pollutants of water – sewage, industrial effluents, soap and detergents, pesticides, fertilizers, heavy metals, Biological magnification and bioaccumulation, Toxic effect of pollutants, Water quality parameters – DO, BOD and COD, Water purification- sedimentation, coagulation, filtration, disinfection, ion exchange, desalination, Air pollution – major regions of atmosphere, pollution by oxides of N, S, C, hydrocarbons and other organic chemicals, automobile exhausts, their physiological effects on vegetation and living organisms, Ozone layer – importance – depletion of ozone – consequences, Greenhouse effect – global warming – acid rain, Toxicity and environmental hazards of pesticides, Radiation pollution and noise pollution.

#### UNIT IV : Electrochemistry (6 hrs)

Electrolysis – metallic and ionic conductors. Migration of ions – relative speed of ions – Transport number – determination of transport number using Hittorf's method. Kohlrausch's law and applications. Conductometric titrations – advantages. Ohms law – specific conductance – molar conductance and equivalent conductance – variation with dilution.



## SEMESTER II

2Hrs/week

### CHEMISTRY - 2C02CHE For Physical & Biological Sciences

Contact Hrs – 36

Credit - 2

#### UNIT I : Chemical kinetics and catalysis (10 hrs)

Definition – reaction rate – factors affecting the rate of a chemical reaction – units – Zero order reactions – Order versus molecularity. Pseudo order reactions – Integrated rate equation for first order reaction – half life – determination of the order – Half life method and Graphical method – Ester hydrolysis – equation. Collision theory (qualitative) Effect of temperature on reaction rate – calculation of  $E_a$  from the values of  $k$  at two temperatures. Transition state theory (qualitative). Types of catalysis – homogeneous and heterogeneous. Characteristics of catalysis reactions – promoters and catalytic poisons. Activation energy and catalysis.

#### UNIT II : Chemical equilibrium (6 hours)

Reversible reactions – Law of mass action – relationship between  $K_c$ ,  $K_p$  and  $K_x$ - thermo dynamic derivation of chemical equilibrium. Liquid systems – Le-Chatlier's Principle – Effects of temperature, pressure and concentrations.

#### UNIT III : Photochemistry (4 hrs)

Chemical reactions Vs Photochemical Reactions. Laws of photo chemistry – Grothus – Draper Law and Stark-Einstein law of photo chemistry. Quantum yield – Hydrogen Chlorine reactions. Photo sensitized reactions– Fluorescence and Phosphorescence – Chemiluminescence and bioluminescence.

#### UNIT IV : Colloids (8 hrs)

Classification – preparation – structure and stability – The electrical double layer – zeta potential – Properties of Colloids – Tyndall effect – Brownian movement- Coagulation of colloidal solution – Hardy-Schultz rule – Flocculation value – protective colloids – Gold number – Emulsions – oil in water and water in oil type emulsions – Emulsifying agents – Gels – imbibition – syneresis – applications of colloids in food, medicine and industry.

#### UNIT V : Analytical Chemistry (8 hrs)

Analytical chemistry – classification – accuracy and precision. Errors, Solubility product – ionic product – common ion effect principle of separation of cations in various groups. pH pOH and ionic product of water. Buffer solutions – Hendersons equations. Principle of volumetric analysis – Adidimetry and alkalimetry, permanganometry, dichrometry, iodometry and iodimetry. Colorimetry – Beer-Lamberts law-applications.

## SEMESTER III

### CHEMISTRY-3C03CHE (BS) For Biological Sciences

3Hrs/week

Contact Hrs –54

Credit – 2

#### UNIT I Co-ordination Chemistry (10 hrs)

Co-ordination compounds and complex ions –co-ordination number- unidentate- bidentate- polydentate ligands– Werners theory – Nomenclature of co-ordination compounds – Effective Atomic Number – Factors affecting the stability of complex ions – valence bond theory of complexes – application of complexes.

#### UNIT II : Introduction to organic chemistry (7 hrs)

Classification of organic compounds – functional groups, homologous series – Shapes of molecules like methane, ethane, ethylene and acetylene – nomenclature of hydrocarbons. Nomenclature of organic compounds bearing functional groups – Benzene structure – Aromaticity, Huckel's rule.

#### UNIT III : Organic reaction mechanisms (11 hrs)

Electron displacement effects - inductive effect – Electrometric effect. Resonance – Hyper conjugative effect and steric effect. Bond fission – Homolysis and heterolysis carbonium ion- carbanion and free radicals – their stability. Classifications of organic reactions – Mechanisms of SN<sub>1</sub> and SN<sub>2</sub> reaction. Walden inversion. Elimination reactions – E<sub>1</sub> and E<sub>2</sub> reactions. Addition of hydrohalogen acids – Markownikoff's rule – peroxide effect. Aromatic electrophilic substitution reactions. Mechanisms of chlorination, nitration, sulphonation and Friedel Crafts reaction – Orientation effect and o, p ratio.

#### UNIT IV : Stereochemistry (10 hrs)

Isomerism – general – stereoisomerism – optical isomerism – chirality – plane polarized light – specific rotation – enantiomerism – racemization – diastereo isomer – optical activity of lactic acid and tartaric acid – meso tartaric acid – resolution – conformational isomerism – ethane, propane and cyclohexane – chair and boat forms- stability – geometrical isomerism – causes – maleic acid and fumaric acid – 1-butene and 2-butene stability.

### **UNIT V : Introduction to Polymer Chemistry (8hrs.)**

Types of polymerization: Chain polymerization, step polymerization – homopolymers and copolymers phenol formaldehyde, urea formaldehyde polymers – Natural rubber and synthetic rubbers – Synthetic fibers– Thermoplastics and Thermosetting plastics – pollution due to plastics – Biodegradable plastics.

### **UNIT VI : Thermodynamics (8 Hrs)**

BASIC CONCEPTS – System – surroundings – open, closed and isolated systems – Isothermal – isochoric and isobaric process – work – heat – energy – internal energy – Heat capacity at constant volume ( $C_v$ ) and at constant pressure ( $C_p$ ) – relation between  $C_p$  and  $C_v$  – First law– The second law – Enthalpy-Entropy-and Free energy-Criteria for reversible and irreversible process- Gibbs –Helmholtz equation(no derivation) concepts of spontaneous and non spontaneous processes.

## SEMESTER III

### CHEMISTRY -3C03CHE(PS) For Physical Science

Contact Hrs –54

3Hrs/week  
Credit – 2

#### Module I : Spectroscopy (8 Hrs)

Electromagnetic spectrum- Ranges of different radiation- general features of spectroscopy- - Types of spectra – Rotational, vibrational and electronic spectra. Rotational spectra - Moment of inertia-rotational constant and bond length. Vibrational spectra – stretching and bending modes- Force constants-Zero point energy. Raman's spectra – Stokes and Anti Stokes Lines – NMR spectra-chemical shift and spin-spin splitting.

#### Module II : Thermodynamics (5 Hrs)

BASIC CONCEPTS – System – surroundings – open, closed and isolated systems – Isothermal – isochoric and isobaric process – work – heat – energy – internal energy – Heat capacity at constant volume ( $C_v$ ) and at constant pressure ( $C_p$ ) – relation between  $C_p$  and  $C_v$  – First law– The second law – Enthalpy-Entropy-and Free energy-Criteria for reversible and irreversible process- Gibbs –Helmholtz equation(no derivation) concepts spontaneous and non spontaneous processes.

#### Module III : Metallurgy (6Hrs)

Metallurgy of aluminium, nickel, titanium and thorium.

#### Module IV : Co-ordination compounds (10 Hrs)

Co-ordination compounds and complex ions –co-ordination number- unidentate- bidentate- polydentate ligands– Werners theory – Nomenclature of co-ordination compounds – Effective Atomic Number – Factors affecting the stability of complex ions – valence bond theory of complexes – application of complexes.

#### Module V : Introduction to organic chemistry (7 Hrs)

Classification of organic compounds – functional groups, Homologous series – shapes of molecules like methane, ethane, ethylene and acetylene – nomenclature of hydrocarbons.

Nomenclature of organic compounds bearing functional groups – Benzene structure – Aromaticity Huckel's rule. Reaction mechanism – electron displacement effect – inductive effects – electromeric effect – resonance – hyper conjugative effect – and steric effect – bond fission – homolysis and heterolysis – carbonium ion – carbanion – and free radicals – their stability.

#### **Module VI : Nuclear Chemistry (10 hrs)**

Concept of nuclides – representation of nuclides – isobars, isotopes and isotones with examples – Detection of isotopes using Aston's mass spectrograph – separation of isotopes by diffusion methods – stability of nucleus – n/p ratio. Liquid drop model, Radioactivity – natural and artificial. Decay constant and half-life period-Radioactive series – Group displacement law – radio isotopes and their applications in structural elucidation, in agriculture and in industry – Radiocarbon dating – Nuclear fission and nuclear fusion. Problems associated in the nuclear waste disposal. Derivation of decay constant – Atomic bomb and hydrogen bomb. Mass defect, Nuclear binding energy.

#### **Module VII : Organometallic compounds (8 Hrs)**

Organometallic compounds – ionic compounds – compounds of elements of group 2 to 5 – compounds of transition elements – multicentric bonds with pi-bonded ligands – bonding in pi-metal complexes. Bonding in ferrocene – Reactions of  $C_5H_5$  Rings – Grignard Reagent – Tetra ethyl lead.

**SEMESTER IV**  
**CHEMISTRY -4C04CHE(BS)**  
**For Biological Sciences**

Contact Hrs –54

3Hrs/week  
Credit – 2

**UNIT I : Carbohydrates (8 hrs)**

Introduction – Definition and classification. Synthesis and properties of Glucose, Fructose and Sucrose – Mutarotation – Epimers and Anomers. D and L configuration. Conversion of glucose into fructose and fructose into glucose. Canesugar – Structure and important properties – Polysaccharides. Starch, Cellulose and Chitin – structure, properties and tests.

**UNIT II : Heterocyclic compounds (10 hrs)**

Heterocyclic systems – 5 membered, 6 membered and condensed systems. Structure of pyrrole, Furan and Thiophene. Electrophilic substitution in pyrrole, Furan and Thiophene. Reactivity and orientation – Saturated 5 numbered heterocyclics – Structure and properties of pyridine. Electrophilic and nucleophilic substitution reactions in pyridine – Basicity and reduction. Quinoline and isoquinoline – preparation and properties.

**UNIT III : Nucleic acids (7 hrs)**

Classification – structure of DNA and RNA – Functions of Nucleic Acids – DNA replication – Bio synthesis of Proteins – Test for DNA and RNA. Effect of hydrogen bonding in biological systems.

**UNIT IV : Amino acids and proteins (10 hrs)**

Classification of Amino acids – Physical and Chemical Properties – Zwitter ions – Iso Electric point – Sorensons formal titration – chromatographic separation of amino acids – Peptides – Proteins classification, characterization by electrolysis – Primary, Secondary and Tertiary level structures of proteins – Tests for Proteins.

**UNIT : Enzymes, Vitamins and Hormones (10 hrs)**

Enzymes – General Nature – Mechanism of Enzyme action, Enzyme catalysis, Michaelis – Menten equation (No derivation) – Application of Enzymes, Enzyme deficiency diseases –

Vitamins – Classifications structure of Vitamin A, B and C. Hormones – Classification – Structures of progesterone, Testosterone, cortisone, adrenaline and Thyroxine.

**UNIT VII : Bio inorganic compounds (9 hrs)**

Introduction – Metal ions in biological system – Metals in medicine – metal – nucleic acid interaction – biochemistry of iron – haemoglobin and myoglobin – structure and functions – mechanism of oxygen binding – Na-K pump – bio chemistry of Zn and Co- Ca in biological system.

## **SEMESTER IV**

### **CHEMISTRY-4C04CHE (PS)** **For physical science**

**Contact Hrs –54**

**3Hrs/week**  
**Credit – 2**

#### **UNIT I: Gaseous State (6 Hrs)**

Ideal gas equation – deviation of gas laws from ideal behaviour – reasons for deviation – Van der Waals equation – critical constants and experimental determination – Maxwell distribution of molecular velocity — average, most probable and RMS velocities – problems.

#### **UNIT II : Crystalline State (9 Hrs)**

Solids – crystalline and amorphous solids – space lattice and unit cell- crystal planes laws of crystallography – Weiss indices and Miller indices - Bravais lattice – Bravais lattices of cubic crystals – characteristic planes in these lattices – interplanar distance ratio – X-ray analysis of crystals – Bragg's equation – problem – crystal structure of NaCl – Liquid crystals – types, properties and applications.

#### **UNIT III : Electromotive force (8 Hrs)**

Electro chemical cell – Daniel cell – Cell reaction – Single electrode potential – statement – explanation of Nernst equation – Standard hydrogen electrode – Calomel electrode – measurement of EMF – determination of pH using Hydrogen electrode – Potentiometric titration – concentration cells.

#### **UNIT IV : Ionic equilibria (7 Hrs)**

Oswald's dilution law – Debye – Huckel theory of strong electrolytes – Relaxation effect and Electrophoretic effect. Degree of dissociation. Common ion effect – Factors influencing degree of dissociation. Solubility product. Salt hydrolysis. Quantitative aspects of salt hydrolysis – determination of degree of hydrolysis. Salts of strong acid and weak bases. Salts of weak acids and weak bases.



### **UNIT V : Binary Liquid Systems (7 Hrs)**

Solutions – Types – Thermodynamic properties of a solution – condition for equilibrium between phases – ideal solutions – Raoult's Law – Vapour pressure of ideal solutions and real solutions – Boiling point diagrams of miscible binary mixtures. Distillation of binary miscible solutions – Azeotropes – Vapour pressure and distillation of immiscible liquids.

### **UNIT VI : Phase rule (6 Hrs)**

Statement and expression of phase rule – Phase diagrams – Study of Water and Sulphur systems – Two component systems involving simple eutectic – Lead – silver system – Desilverisation of lead – Pattinson's process – Two component systems forming congruent melting point- Magnesium-Zinc system- Deliquescence efflorescence.

### **UNIT VII : Instrumental methods in Chemistry (11 Hrs)**

Thermal methods of analysis – TGA and DTA – instrumentation – application – characterisation of polymers. Spectrophotometry-basic instrumentation of UV – visible spectrophotometry – maximum optical density measurement – Atomic Absorption Spectroscopy-instrumentation- application- Electro analytical method – amperometry – amperometric titration – applications – advantages and disadvantages.

**Reference Books**

|     |                                               |                                  |
|-----|-----------------------------------------------|----------------------------------|
| 1.  | Inorganic chemistry :                         | Puri and Sharma                  |
| 2.  | Inorganic chemistry :                         | P.L.Soni                         |
| 3.  | Concise inorganic chemistry :                 | J.D.Lee                          |
| 4.  | Basic inorganic chemistry :                   | Cotton and Wilkinson             |
| 5.  | Physical Chemistry :                          | Puri and Sharma                  |
| 6.  | Physical Chemistry                            | P.L.Soni and Dharmarah           |
| 7.  | Elements of Physical Chemistry                | Glasstone and Lewis              |
| 8.  | University Chemistry                          | Bruce M Mahan and Rollie J Myers |
| 9.  | Basic Physical Chemistry                      | Moore W.J                        |
| 10. | Essentials of Physical Chemistry              | Bahl,Tuli and Arun               |
| 11. | Advanced organic Chemistry :                  | Jerry March                      |
| 12. | Organic Chemistry                             | Morrison and Boyd                |
| 13. | Environmental Chemistry                       | A.K.De                           |
| 14. | Organic Chemistry Vol. 1 and II               | I.L.Finar                        |
| 15. | Polymer Chemistry                             | Gawarikar and Vishvanadhan       |
| 16. | Organic reaction mechanism :                  | Peter Sykes                      |
| 17. | Organic reaction mechanism :                  | Mukherjee and Singh              |
| 18. | Organic photochemistry:                       | Depuy and Chapman                |
| 19. | Organic Sptroscopy                            | William Kemp                     |
| 20. | Pragathi's Instrumental Methods of Analysis : | H.Kaur                           |

# SEMESTER I, II, III & IV

## 4C05 CHE- COMPLEMENTARY CHEMISTRY PRACTICAL

### 1. Qualitative Inorganic Mixture Analysis

#### a. Reactions of cations:

Study of the reactions of the following cations with a view of their identification and confirmation.

Lead, Copper, Iron, Aluminium, Zinc, Manganese, Cobalt, Nickel, Barium, Calcium, Magnesium and Ammonium.

b. Systematic qualitative analysis of a solution containing any two of the cations given in (a) by semi micro methods.

### 2. Volumetric Analysis

(a) Introduction to electronic balance and analytical balance – volumetric apparatus – filtration, Equivalent and molecular mass of compounds – Normality and Molarity – Primary standards – Preparation of standard solution – Principles of Volumetric analysis.

(b.) For acidimetry, alkalimetry and permanganometry two burette method may be used and for other volumetric analyses conventional methods can be used. (Students should prepare standard solutions. The experiments should have the making up of the given solution and double titration in each experiment.

#### a. Acidimetry and alkalimetry

Estimation of (a) strong acids (b) strong bases (c) weak acids (d) weak bases.

#### b. Permanganometry

Estimation of (a)  $\text{Fe}^{2+}/\text{FeSO}_4 \cdot 7\text{H}_2\text{O}/\text{Mohr's salt}$  (b) Oxalic acid

#### c. Dichrometry

Estimation of (a)  $\text{Fe}^{2+}$  using internal indicator (b)  $\text{Fe}^{3+}$  after reduction with stannous chloride/HCl

#### d. Iodimetry and iodometry

Estimations of (a) copper (b) potassium dichromate and (c) Potassium permanganate.

## VIVA VOCE

### References

|    |                                                                  |               |
|----|------------------------------------------------------------------|---------------|
| 1. | A Text Book of Qualitative Analysis including semi micro methods | A.I.Vogel     |
| 2. | Semi micro Qualitative Analysis                                  | V.V.Ramanujan |
| 3. | A Text Book of Quantitative inorganic Analysis                   | A.I.Vogel     |
| 4. | Practical chemistry for B.Sc Chemistry                           | A.O.Thomas    |

## MODEL QUESTION COMPLEMENTARY CHEMISTRY

### PRACTICAL

Credit: 4

Time : 4 Hours  
Total 32 marks

1. Identify and confirm the two Cations in the given solution by systematic qualitative analysis. Submit a record of your tests, observation and inferences along with the report.
2. Determine the amount of  $\text{HNO}_3$  in the Whole of the given solution You are provided with Pure Crystalline  $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$  and Approximately N/10 NaOH Solution.
3. In the first ten minutes,
  - (a.) Write a brief outline of the procedure you would adopt for the estimation of Copper in the given solution of Copper Sulphate, given With A.R. potassium dichromate and N/10 Sodium thiosulphate.
  - (b) Calculate the mass of crystalline Copper Sulphate required to prepare 200 ml 0.2 N Solution.
4. Viva Voce

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Sd/

Dr. V.Geetha,

Chairperson, Board of Studies in Chemistry (UG)

**Pattern of Question paper for U.G Core Courses (Chemistry)-Theory**

**KANNUR UNINERSITY**

Reg. No.:  
Name:  
-----Semester

Course code:

**Course title.....**

**Programme.....**

Total marks: 40  
Time: 3hrs.

Answer the questions in English only

**Section A**

(very short answer type - Each carries 1 mark -Answer all 4 questions)

1. very short answer type
2. very short answer type
3. very short answer type
4. very short answer type

[4x1=4 marks]

**Section B**

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. Short answer type question
6. Short answer type question
7. Short answer type question
8. Short answer type question
9. Short answer type question
10. Short answer type question
11. Short answer type question
12. Short answer type question
13. Short answer type question
14. Short answer type question

[7x2=14 marks]

**Section C**

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. Short essay/problem type question
16. Short essay/problem type question
17. Short essay/problem type question
18. Short essay/problem type question
19. Short essay/problem type question
20. Short essay/problem type question

[4x3=12 marks]

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21. Long essay type question
22. Long essay type question
23. Long essay type question
24. Long essay type question

**Model Question Paper for U G Core courses (Chemistry) – Theory**

**KANNUR UNIVERSITY**

Reg. No.:

Time:3hrs

Name:

Max Marks:40

Semester -1 Theoretical & Inorganic Chemistry Course code:1B01CHE

**Section A**

(Answer all questions. Each question carries 1 mark)

1. What do you mean by precision in measurements?
2. State and explain Heisenberg's uncertainty principle.
3. What is mass defect?
4. State Fajan's rule.

**Section B**

(Answer any seven questions. Each question carries 2 marks)

5. What are Nodes? How many angular and radial nodes are in an orbital?
6. Account for the bond angles of  $\text{BeCl}_2$ ,  $\text{BCl}_3$ ,  $\text{CCl}_4$ , and  $\text{NH}_3$  using VSEPR theory.
7. What are the factors affecting lattice enthalpy?
8. How accuracy and precision are related?
9. Which among the following has dipole moment?  $\text{H}_2\text{O}$ ,  $\text{CCl}_4$ ,  $\text{CHCl}_3$ ,  $\text{CO}_2$ . Justify your answer.
10. Explain briefly about Photoelectric effect.
11. Explain nuclear Q value.
12. Sketch the shape of s, p and d orbitals.
13. Arrange  $\text{O}_2$ ,  $\text{O}_2^{2+}$  and  $\text{O}_2^{2-}$  in the increasing order of bond length.
14. Explain the stability of a nucleus in terms of n/p ratio and binding energy.

**Section C**

(Answer any 4 questions. Each question carries 3 marks)

15. List all possible sub shells and orbitals associated with principal quantum number  $n=3$ .
16. Draw the arrangement of all electron pair on the central atom  $\text{CH}_4$ ,  $\text{NH}_3$ ,  $\text{H}_2\text{O}$  and  $\text{PCl}_5$ .
17. Give the principle of Born – Haber cycle and explain its applications.
18. Explain the significance of quantum numbers.
19. Outline the working principle of Geiger-Muller counter.
20. What are nuclear reactors? How are they classified? Explain the working of a fast breeder reactor.

**Section D**

(Answer any 2 questions. Each question carries 5 marks)

21. (I) Describe the radio carbon dating technique.  
(II) Mention any 2 examples for the applications of radio isotopes in medical diagnosis.
22. Give Bohr Postulates and derive the expressions for energy of hydrogen atom.
23. Mention the common types of errors in analytical determination and write suitable methods for the reduction of such errors.
24. Illustrate the features of hybridization by taking suitable example

Reg. No.:

Total Marks:40

Name:

Time :3Hrs

Semester -II-Analytical Chemistry 2B03CHE

**Section A**

(Answer all questions. Each question carries 1 mark)

1. Identify the the conjugate acid-base pair in HF dissolved in  $H_2SO_4$
2. What are the qualities of a salt which can be used as a primary standard
3. Explain the principle involved in gas chromatography
4. Why  $NH_4Cl$  is added during the group precipitation for group III analysis?

**Section B**

(Answer any seven questions. Each question carries 2 marks)

5. Write the principle involved in complexometric titration
6. Dilute solution of alkali metal in liquid ammonia are blue in colour & paramagnetic. Explain.
7. Explain leveling effect
8. Sketch the titration curve for  $Na_2CO_3$  vs HCl
9. Mention the applications of adsorption chromatography.
10. Explain HSAB principle.
11. Explain the principle involved in thermogravimetric analysis.
12. What is meant by redox titration? Why  $KMnO_4$  is not used as a primary standard?
13. What do you mean by neutron diffraction method?
14. What is the difference between Iodometric and iodimetric titration. Give one example for each .

**Section C**

(Answer any 4 questions. Each question carries 3 marks)

15. Explain the theory and principle involved in TLC.
16. Discuss the importance of solubility product in qualitative analysis.
17. Explain the principle involved in thermometric titration.
18. Give some important reactions carried out in liquid  $SO_2$
19. Explain the thermogram of calcium oxalate in an inert atmosphere.
20. What are Lewis acids? arrange the following in the order of increasing acid strength  
i)  $H_2O$  ii)  $CaCl_2$  iii)  $SO_3$  iv)  $CO_2$

**Section D**

(Answer any 2 questions. Each question carries 5 marks)

21. Briefly describe the unit operations involved in gravimetric analysis
21. What is the principle involved in solvent extraction? Explain the factors favouring and affecting extraction.
22. Illustrate The characterisation of polymers using DTG
23. Discuss the nature of bonding and stability of hard-hard and soft-soft acid base combinations.



**KANNUR UNIVERSITY**

Reg. No.:

Total Marks:40

Name:

III<sup>rd</sup> Semester

Time:3Hrs

**Course title: Organic Chemistry –I 3B04CHE**

Answer the questions in English only

**Section A**

(Objective type - Each carries 1 mark -Answer all 4 questions)

1. Give the IUPAC names of
  - a)  $C_2H_5-CH(OH)-CH_2-CO-CH_3$  and
  - b)  $C_2H_5-CH(CH_2OH)-CH_2-CH_2-CH_2OH$
2. Write the structural formula of
  - a) 3,4-Dimethylpentanal
  - b) Methyl cyclopropane
3. What is 'electromeric effect'?
4. What do you mean by the term 'Homologous series'?

[4x1=4 marks]

**Section B**

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. Chloroacetic acid is stronger than acetic acid. Why?
6. Explain the hybridisation present in Ethyne.
7. Write the classification of dienes with examples.
8. Differentiate between singlet carbene and triplet carbene.
9. Explain Kolbe's electrolytic method for the synthesis of alkanes.
11. How is phenol synthesised from cumene?
12. Explain the chlorination of methane via free radical mechanism.
13. Give one method each for the preparation of ethylene dichloride and ethylidene chloride.
14. Explain Kharasch effect.

[7x2=14 marks]

**Section C**

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. How is chloroform prepared from acetone? Explain with example.
16. Write short notes on :
  - a) Resonance
  - b) Hyperconjugation
17. Discuss Hofmann's rule and the Saytzeff rule of elimination with examples
18. Write a note on ozonolysis of alkenes and alkynes.
19. Discuss any two methods to distinguish primary, secondary and tertiary alcohols.
20. What products are formed in the following reactions? Illustrate with proper equations.
  - a) 2-butyne treated with Selenium dioxide.
  - b) Propylene treated with Baeyer's Reagent.
  - c) Acetylene treated with water in presence of sulphuric acid and mercurous sulphate.

[4x3=12 marks]

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21. What are free radicals? How are they generated? Discuss their structure and stability.
22. Discuss the mechanism and stereochemistry of  $S_N1$  and  $S_N2$  reactions of alkyl halides.

23. Explain the following
- Haworth Synthesis of naphthalene
  - Synthesis of Anthracene from benzyl chloride.
  - Wislicenus method for the synthesis of cycloalkane.
24. Discuss the mechanism of
- Pinacol-Pinacolone rearrangement
  - Claisen rearrangement

[2x5=10 marks]

**Model Question paper for U.G Core Courses (Chemistry)-Theory**

**SEMESTER IV 4B06CHE- ORGANIC CHEMISTRY II**

**KANNUR UNIVERSITY**

Reg. No.:

Name:

Total marks: 40

Time:3Hrs

Answer the questions in English only

**Section A**

(very short answer type - Each carries 1 mark -Answer all 4 questions)

1. Write an example for 3 membered ring which exhibits aromaticity.
2. What are the two cyclic forms of D-glucose ?
3. What is the hybridisation state of N atom in pyridine
4. Maleic and Fumaric acid are examples of which type of isomers ?

[4x1=4 marks]

**Section B**

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. Explain the molecular orbital theory of aromaticity.
6. Convert fructose to glucose
7. Discuss the reaction of fructose with phenyl hydrazine.
8. Compare the basicity of pyrimidine and pyridine.
9. Give two methods for the preparation of Indole.
10. Discuss the structure and aromaticity of pyrrole.
11. Explain racemization with examples
12. Explain specific rotation.
13. Write the synthesis and applications of polyethylene.
14. Write a short note on synthetic rubbers with example.

[7x2=14 marks]

**Section C**

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. Explain the aromaticity of cyclopentadienyl cation, cycloheptatrienyl cation and ferrocene
16. Explain epimerization using glucose
17. Draw the structure of sucrose. Explain whether it is reducing or non-reducing sugar.
18. Write the synthesis of quinoline by Skraup method and mention the reagents and its uses.
19. Explain ring opening polymerization using epoxy resins.
20. Write any three methods employed for the resolution of racemic mixtures

[4x3=12 marks]

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21. Explain S<sub>N</sub>Ar mechanism and Benzyne mechanism
22. Discuss the structure of glucose by means of configuration, cyclic structure and Haworth Representation.

23. a) Explain the optical isomerism of tartaric acid  
b) Explain the conformations of ethane with energy diagrams.
24. a) Explain condensation and addition polymerisations with examples  
b) Explain Hofmann's exhaustive methylation for the prediction piperidine structure.

Reg. No.:  
Name:

Total marks: 40  
Time: 3Hrs

V Semester B.Sc. Degree Examination Chemistry (Core course)

5B07 CHE: Inorganic Chemistry-I

Section-A

(Answer all questions. Each question carries 1 mark)

1. Give a method for the preparation of  $B_2H_6$ .
2. Name the different isotopes of Hydrogen – what is the nuclear spin of ortho hydrogen.
3.  $SiCl_4$  is readily hydrolyzed but not  $CCl_4$ . Why?
4. Cupric salts are colored while cuprous salts are colorless. Why?

Section-B

(Answer any 7 questions. Each question carries 2 marks)

5. The first ionization energy of Be is greater than that of Lithium, but the position is reversed for the second ionization energy. Why?
6. What is inorganic benzene? How is it prepared?
7. Show that metal-metal bond exists in  $Mn_2(CO)_{10}$
8. What are clathrates? Give 2 examples.
9. Give 2 uses of He and Ne.
10. Solution of alkali metals in liquid ammonia act as reducing agent. Why?
11. What is diagonal relationship? Explain with an example.
12. Explain the term inert pair effect with a suitable example.
13. The elements of the second period can show a maximum covalency of 4, while elements of the third and higher periods can show covalency higher than 4. Why?
14. List the various oxoacids of sulphur.

Section-C

(Answer any 4 questions. Each question carries 3 marks)

15. What are acidic, basic and amphoteric oxides? Give one examples for each type. Discuss the periodic trend in acid-base character of oxides of 'p' block elements.
16. What are crown ethers and cryptates? Give examples.
17. Discuss the classification and preparation of different types of hydrides.
18. What are refractories? How is silicon carbide prepared? Give 2 uses of it.
19. Define electro negativity. How will you calculate electro negativity by Pauling and Mulliken's method?
20. Describe the structure and bonding of Ferrocene.

Section-D

(Answer any 2 questions. Each question carries 5 marks)

21. Discuss the preparation and structures of  
(i)  $Fe(CO)_5$  (ii)  $Fe_2(CO)_9$  (iii)  $Co_2(CO)_8$
22. Give a brief account of preparation, structure and bonding of  
(i)  $XeF_6$  (ii)  $XeO_2F_2$  (iii)  $XeO_3$
23. Why are 'd block' elements called transition elements. Give their important characteristics.
24. What are inter halogens? Discuss the preparation and structures of any four inter halogen compounds.

V Semester B.Sc. Degree Examination

5B08 CHE: Inorganic Chemistry-II

Time: 3 Hours

Max: 40 marks

Section-A

(Answer all questions. Each question carries 1 mark)

1. What is the most stable oxidation state of Cerium. Why?
2. Give the IUPAC name of a)  $[\text{K}_4\text{Fe}(\text{CN})_6]$  b)  $[\text{Co}(\text{NO}_2)(\text{NH}_3)_5]\text{Cl}_2$
3. Give the name and composition of two nonferrous alloys.
4. What are the toxic effects of copper and lead in biological systems?

Section-B

(Answer any 7 questions. Each question carries 2 marks)

5. Distinguish between a double salt and a complex salt. Give one example for each.
6. What are the advantages of powder metallurgy?
7. What are the different methods used in the heat treatment of steel?
8. What is spectrochemical series?
9. What are metallo enzymes? Give 2 examples and their functions.
10. What are hemoglobin and myoglobin?. Give their functions.
11. Write any two methods adopted for corrosion control.
12. State and explain EAN rule.
13.  $[\text{Ni}(\text{CN})_4]^{2-}$  is diamagnetic and square planar. Why?
14. What is meant by cooperativity effect in Hemoglobin?

Section-C

(Answer any 4 questions. Each question carries 3 marks)

15. Describe the electrochemical theory of corrosion.
16. Give 3 examples for alloy steels and mention their uses.
17. Discuss the stereochemistry of coordination compounds with coordination number 3 and 5.
18. What are Trans actinide elements? How are they produced? Name any 2 members of this group.
19. Explain the separation of lanthanides by ion exchange method.
20. Describe briefly about biological fixation of Nitrogen.

Section-D

(Answer any 2 questions. Each question carries 5 marks)

21. Discuss the splitting of 'd' orbitals in (i) octahedral complex (ii) tetrahedral complex (iii) square planar complex.
22. Describe the extraction of copper from its ore.
23. What is meant by stability constant of coordination compounds? Discuss the factors influencing the stability of coordination compounds.
24. What is meant by lanthanide contraction? What are the causes and consequences of it?

**PATTERN OF QUESTION PAPER FOR U.G CORE COURSE (CHEMISTRY)**

Reg No. ....

TOTAL MARK: 40

Name

TIME:3 hrs

V SEMESTER

**Physical Chemistry I: 5B09CHE**

**Section A**

(answer all the 4 questions – each carries 1 mark )

- 1 What is the significance of “a” in the vanderWals equation?
- 2 Write the miller indices of a plane having intercepts  $2a, 2b, \alpha$ .
- 3 For critical constant factor, what is compression factor Z .
- 4 Write down the expression for the osmotic pressure of the solution .

**Section B**

(short answer type – each carries 2 mark – answer 7 questions out of 10)

- 5 What are the significance of vander waals constants.
- 6 What is isotonic solutions? Write an example.
- 7 State and explain trouton’s rule.
- 8 What is Hall effect? Explain.
- 9 Calculate the net number of particles per unit cell in fcc arrangement.
- 10 Explain why boiling point of a solvent is increased by the addition of a non volatile solute?
- 11 State the law of equipartition of energy.
- 12 Briefly explain the free volume theory of liquids.
- 13 What is liquid crystal? How it is different from normal crystals?
- 14 What do you meant by azeotropic mixture? Give one example.

**Section c**

(short essay type/problem type– each carries 3 marks –answer any 4 questions)

15. The total pressure exerted by a mixture of nitrogen, oxygen and argon is 100kpa, given the mole fractions of nitrogen and oxygen are 0.78 and 0.21 respectively. Calculate the partial pressure of all the three gases
- 15 A refraction from the (111) plane of a cubic crystal was observed at a glancing angle of 11.8 degree when X-rays of wavelength 154 pm were used. What is the edge length of the unit cell?
- 16 The molar heat of vapourisation of water at 100 degree celcius is 40.585KJ. at what temperature will a solution containing 5.60g of glucose in 1000g of water boil? Molar mass of solute=180g/mol,  $R=8.314\text{J/K/mol}$
17. What do you meant by co-efficient of viscosity? Explain one method to determine the co-efficient of viscosity of a liquid?
- 19 what is super conductors? What are type I and type II super conductors. Give example
- 20 Explain the principles of steam distillation. Find the expression for molar mass from it.

**Section D**

(long essay type – each carries 5 mark – answer 2 questions out of 4)

- 21 a) Derive Brag’s equation.(2)  
b) KCl has rock salt structure. But X-ray diffraction studies shows that it has simple cubic lattice why? (1)

- c) When a metal crystallizes in fcc, the edge length is found to be 3.5 angstrom and in bcc it is 3 angstrom. Calculate the ratio of the densities of metal in the fcc and bcc forms. (2)
- 22 a) What is optical activity and how it is measured? (3)  
b) What is parachor? Give its two applications. (2)
- 23 a) Explain the determination of critical temperature and critical pressure. (3)  
b) calculate the rms velocity of methane at 37 degree Celsius. (2)
- 24 a) What is colligative properties? (1)  
b) Derive thermodynamically the depression in freezing point and calculate molecular mass expression from it? (4)

Reg. No.:  
Name:

Semester V

Total marks: 40  
Time: 3hrs

**Course title: PHYSICAL CHEMISTRY II 5B10CHE**

Answer the questions in English only

**Section A**

(Each carries 1 mark -Answer all 4 questions)

1. Enthalpy of formation of ethanol at 298K is  $-277.8\text{kJ mole}^{-1}$ . Write down the thermochemical equation.
2. Calculate the work done when 20g of magnesium dissolves in HCl at 298K in an open beaker at 1 atmosphere.
3. What are azeotropes?
4. Define gold number.

[4x1=4 marks]

**Section B**

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. Differentiate between isothermal and adiabatic process.
6. Explain the Nernst Heat Theorem.
7. What are exoergonic and endoergonic reactions?
8. 5 moles of  $\text{PCl}_5$  was taken in a 2L vessel and allowed to dissociate. 80% of  $\text{PCl}_5$  dissociated when equilibrium was attained. Calculate the equilibrium constant of the reaction,  
 $\text{PCl}_5(\text{g}) \rightarrow \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$
9. State and illustrate Hardy-Schulze rule.
11. Discuss the phase diagram of water system.
12. Calculate  $K_p/K_c$  for the reactions at 298K  
 $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{NO}(\text{g})$   
 $\text{NH}_4\text{Cl}(\text{s}) \rightarrow \text{NH}_3(\text{g}) + \text{HCl}(\text{g})$
13. A monoatomic ideal gas at 200K is expanded isothermally to twice its initial volume. To what temperature should it be cooled to restore its entropy to its initial value?  $C_v = 3/2R$ .
14. Distinguish physical adsorption from chemical adsorption.

[7x2=14 marks]

**Section C**

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. What are the assumptions of Langmuir theory? Derive the Langmuir adsorption isotherm.
16. Discuss the kinetic and electrical properties of colloids.
17. What is congruent melting point? Explain on the basis of phase diagram of  $\text{FeCl}_3\text{-H}_2\text{O}$  system
18. State distribution law. How is it useful in solvent extraction?
19. Derive the Clausius-Clapeyron equation. How can we use it for the study of solid-liquid equilibrium.
20. State and explain the third law of thermodynamics. Explain how the absolute entropy of a gas is determined using the law.

[4x3=12 marks]

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21. Derive van't Hoff reaction isotherm.
22. a) What is the change in boiling point of water at 373 K per Pa change in atmospheric pressure? The enthalpy of vaporisation is  $40.69\text{kJ mol}^{-1}$ . Molar volume of liquid water is  $0.019 \times 10^{-3}\text{m}^3\text{ mol}^{-1}$  and molar volume of steam is  $30.199 \times 10^{-3}\text{m}^3\text{ mol}^{-1}$ , all at 373K and 1atm.  
b) Derive Gibbs-Duhem equation.
23. Obtain Kirchhoff's equation. Show that Joule Thomson expansion is isoenthalpic process.
24. Derive Phase rule. B) Derive Gibbs-Helmholtz equation.

[2x5=10 marks]



**Model Question paper for U.G Core Courses (Chemistry)-Theory**

**VI SEMESTER 6B14CHE ORGANIC CHEMISTRY III**

**KANNUR UNIVERSITY**

Reg. No.:

Name:

Total marks: 40

Time:3Hrs

Answer the questions in English only

**Section A**

(Objective type - Each carries 1 mark -Answer all 4 questions)

1.  $\beta$ -Hydroxy aldehydes are generally known as
2. Write the chemical structure of citric acid
3. What is the Compound obtained on heating ammonium thiocyanate ?
4. Which aminoacid contains Indole nucleus ?

[4x1=4 marks]

**Section B**

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. Explain Wolf-Kishner and Clemensen reduction
6. What are the products obtained when cinnamaldehyde is treated with  $\text{LiAlH}_4$  and  $\text{NaBH}_4$
7. Write about antipyretics, analgesics, tranquillizers and antiseptics with examples each.
8. In Rosenmund's reduction the catalyst  $\text{Pd/BaSO}_4$  is usually poisoned with sulphur. Give reason.
9. Give the industrial method of preparation (Fermentation) of lactic acid.
10. Explain the Order of basicity of aliphatic amines
11. What is Reformatsky reaction?
12. Write a short note on Norrish type I and II cleavages
13. Explain Isoprene rule
14. Give a short note on microwave and ultrasound assisted reactions.

[7x2=14 marks]

**Section C**

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. Write the different reactions of acetaldehyde with  $\text{NaHSO}_3$ , ethanol and semicarbazide.
16. How methyl magnesium bromide reacts with acetaldehyde,  $\text{CO}_2$  and ethyl acetate.
17. Explain Blanc's rule and its importance.
18. Explain cycloaddition using Diels-Alder reactions.
19. What is Isoelectric point ? Explain the properties and importance of Zwitter ion
20. Give different principles of green chemistry with their explanations and examples

[4x3=12 marks]

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21. Write the mechanism of Claisen condensation and Reformatsky reaction
22. Explain the  $1^0$ ,  $2^0$ ,  $3^0$  and  $4^0$  structure of proteins.
23. Write the classification of dyes based on structure and mode of applications
24. a) Distinguish  $1^0$ ,  $2^0$ ,  $3^0$  &  $4^0$  amines through Hoffmann's and Hinsberg's method.  
b) Explain Arndt-Eisert reaction with mechanism

## KANNUR UNIVERSITY

Reg. No.:

Total marks: 40

Name:

SEMESTER VI

Time: 3hrs

### Course title: PHYSICAL CHEMISTRY III 6B15CHE

Answer the questions in English only

#### SECTION A

(Each carries 1 mark -Answer all 4 questions)

- 1 Define the term single electrode potential
- 2 Define overvoltage
- 3 Explain the term quantum yield
- 4 What is meant by pseudo first order reaction? Give one example. (4 x 1 = 4)

#### Section B

(Short answer type - Each carries 2 mark -Answer 7 questions )

5. What are fuel cells.
6. The solubility product of calcium oxalate in water at 298K is  $2 \times 10^{-9} \text{ mol L}^{-1}$ . Find the solubility of the salt in a .01M solution of ammonium oxalate.
7. For the Daniel cell reaction  $\text{Zn}_{(s)} + \text{Cu}^{2+}_{(aq)} \rightleftharpoons \text{Zn}^{2+}_{(aq)} + \text{Cu}_{(s)}$  the standard free energy of formation of  $\text{Zn}_{(s)}$ ,  $\text{Cu}_{(s)}$ ,  $\text{Cu}^{2+}_{(aq)}$  and  $\text{Zn}^{2+}_{(aq)}$  are 0, 0, 64.4 and -154.0 KJ/mol respectively. Calculate the standard EMF of the cell.
8. What is the effect of dilution in the specific conductivity of a strong electrolyte ?
9. Explain one method used for the order of a reaction.
10. Differentiate between threshold energy and activation energy.
11. Explain the term photosensitization.
12. Distinguish between homogeneous and heterogeneous catalysts.
13. Discuss the working of a calomel electrode and explain how its potential depends on the concentration of  $\text{Cl}^-$  ion.
14. Why is an aqueous solution of ferric chloride acidic? (7x2=14)

#### Section C

( Each carries 3 mark -Answer 4 questions )

15. What are concentration cells? Explain the different types.
16. What is Kohlrausch's law ? Write any two applications of it.
17. The rate constant of a reaction is  $1.78 \times 10^{-4} \text{ L mol}^{-1} \text{ s}^{-1}$  at  $19^\circ\text{C}$  and  $1.38 \times 10^{-3} \text{ L mol}^{-1} \text{ s}^{-1}$  at  $37^\circ\text{C}$ . Evaluate Arrhenius parameters of the reaction.
18. Explain the application of conductance measurements in determining solubility of a salt.
19. Calculate the equilibrium constant for the reaction occurring in the cell.  $\text{Zn}|\text{Zn}^{2+}(\text{aq})||\text{Fe}^{3+}, \text{Fe}^{2+}|\text{Pt}$ . The standard electrode potentials are  $E^\circ \text{Fe}^{3+}, \text{Fe}^{2+} = 0.77\text{V}$  and  $-0.76\text{V}$ . Comment on your result.
20. Outline the collision theory of reaction rate.

(4x2=8)

#### Section D

(Long essay type - Each carries 5 mark -Answer 2 questions)

21. a) Give the principle used in the potentiometric titration of strong acid – strong base.  
b) A Zn rod is placed in 0.1M solution of  $\text{ZnSO}_4$  at  $25^\circ\text{C}$ . Assume that the salt is dissociated to the extent of 95% at this dilution. Calculate the potential of the electrode at this temperature.  $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76\text{V}$
22. a) What are the assumptions of Langmuir Theory. Derive the Langmuir adsorption isotherm.  
b) Write a note on surface films
23. Write notes on a) fluorescence b) phosphorescence and c) Chemiluminescence.
24. Outline Hittorf's method of determination of transport number.

**6B16CHE : Physical Methods in Chemistry**

**Name:**

**Reg No:**

**Semester VI**

Time : 3 hours  
Max. marks : 40

**Section A**

*Answer all questions. Each questions carries 1 mark.*

1. Give the normal modes of vibrations of CO<sub>2</sub> molecule
2. Write the Point group of water and ammonia molecule
3. Explain Beer Lamberts law
4. give any 2 applications of nanoparticles

**(4x1 = 4)**

**Section B**

*Answer any 7 questions. Each questions carries 2 marks.*

5. Explain the effect of hybridization on the frequency of vibration.
6. State and explain Beer- Lamberts law.
7. Give advantages of amperometric titration.
8. Why TMS is used as an internal standard in NMR ?
9. Antistokes lines are less intense than stokes lines. Why?
10. Write any two chemical methods for the preparation of nanomaterials.
11. Differentiate between symmetry elements and symmetry operations.
12. Write down the Ilkovic equation and explain the terms.
13. What do you mean by meta stable ion?
14. What are auxochromes? Give examples.

**(7x2=14)**

**Section C**

*Answer any 4 questions. Each question carries 3 marks.*

15. Explain the  $\lambda_{(\max)}$  values of ethylene (175nm), 1,3-butadiene(217nm), 1,3,5-hexatriene (250nm). Account for it.
16. How will you account for the appearance of prominent peaks at m/z 31, 42 & 70 in the mass spectrum of n-pentanol ?
17. Give the importance of half-wave potential in polarographic method.
18. What are the different factors affecting chemical shift?
19. What is the principle of AAS ?
20. Sketch the stretching modes of vibrations of CO<sub>2</sub> and H<sub>2</sub>O.

**(4x3=12)**

**Section D**

*Answer any 2 questions. Each question carries 5 marks.*

21. What do you mean by group frequencies in IR spectroscopy? What are the factors influencing vibrational frequencies?
22. Draw the typical titration curves in amperometric titration and explain?
23. Give the instrumentation of spectrophotometry.
24. Explain the properties and applications of carbon nanotubes.

**(2x5=10)**

**Model Question paper for U.G Core Courses (Chemistry)-Theory**

**6B17CHE–A. ENVIRONMENTAL CHEMISTRY**

**KANNUR UNINERSITY**

Reg. No.:

Name:

VI-----Semester

Total marks: 40

Time: 3hrs.

Answer the questions in English only

**Section A**

(Objective type - Each carries 1 mark -Answer all 4 questions)

1. In which region of atmosphere ozone layer is found ?
2. Give an example for primary and secondary pollutants
3. What is the full form of ISI ?
4. Which element is responsible for Minamata disease ?

[4x1=4 marks]

**Section B**

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. Mention the temperature and composition of different regions of atmosphere.
6. What are the different sources of soil pollution
7. What are the different health problems caused by Cd poisoning ?
8. What are the benefits of liming of soil ?
9. What are the biological effects of radiation
10. What are the different sources of mercury ?
11. Explain the harmful effects of noise pollution
12. Write a short note on Global warming.
13. Write a short note on acid rain
14. Write any method for the control of air pollution.

[7x2=14 marks]

**Section C**

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. Explain Hydrologic cycle.
16. Explain the different factors affecting soil formation.
17. Write a short note on ion exchange reactions in soil
18. Discuss the methods for the control of ozone depletion.
19. Explain Green house effect
20. What is El Nino phenomenon ?

[4x3=12 marks]

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21. Explain bioremediation with its classification and examples.
22. Explain hardness of water. What are the methods employed for the removal of hardness.
23. Explain Biomedical waste, E-waste and Muncipal solid waste management.
24. Write a short note on BOD and COD and its determination.

**Model Question paper for U.G Core Courses (Chemistry)-Theory**

**6B17CHE–B. APPLIED CHEMISTRY**

**KANNUR UNINERSITY**

Reg. No.:

Name:

VI-----Semester

Total marks: 40

Time: 3hrs.

Answer the questions in English only

**Section A**

(Objective type - Each carries 1 mark -Answer all 4 questions)

1. Simple method used for the removal of temporary hardness is
2. Expand the chemical name of DDT
3. Vitamin C is otherwise known as
4. Materials which are able to return to their initial shape after deformation when heated is known as

[4x1=4 marks]

**Section B**

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. What are the importance of dissolved oxygen ?
6. What are the disadvantages of hard water ?
7. Explain the colour coding of pesticides
8. What is meant by NPK value of fertilizers ?
9. What are carbamates ?
10. Write a short note on carbohydrate metabolism
11. Explain the rancidity in fats and oils.
12. Write a short note on harmful effects of food additives.
13. Give a short note on Piezoelectric materials
14. What are pH-sensitive Polymers ?

[7x2=14 marks]

**Section C**

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. Discuss the methods used for softening of water.
16. Give a short note on organophosphorous pesticide.
17. What are the harmful effects of food additives ?
18. Write a short note on chemicals present in Soft drinks and their effects
19. Explain the classification of amino acids on the basis of structure
20. Write a short note on different types of nano devices

[4x3=12 marks]

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21. What are the methods employed for the desalination of brackish water ?
22. Explain the classification of pesticides
23. Explain Classification of Vitamins on the basis of sources and functions. Also explain deficiency symptoms of these vitamins.
24. Explain different types of smart materials with their applications.

**Model Question paper for U.G Core Courses (Chemistry)-Theory**

**6B17CHE–C. POLYMER CHEMISTRY**

**KANNUR UNINERSITY**

Reg. No.:

Course code:

Name:

-

VI-----Semester

Total marks: 40

Time: 3hrs.

Answer the questions in English only

**Section A**

(Objective type - Each carries 1 mark -Answer all 4 questions)

1. What are the monomers used for the preparation of Nylon 66 ?
2. What is the chemical form of Ziegler Natta catalyst
3. Write the chemical formula for Isoprene
4. Give an example for semi synthetic polymer.

[4x1=4 marks]

**Section B**

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. Explain the classification of polymers on the basis of thermal and mechanical properties.
6. Write a short note on glass transition temperature.
7. Explain the tacticity in polymers
8. Write a short note on neoprene rubber
9. Write the importance of Ziegler Natta catalyst in polymerization
10. Write a short note on vulcanization of rubber
11. Explain coordination polymerization
12. What is Gutta Percha ?
13. Give a short note on biodegradable polymers
14. Give examples for high temperature and fire-resistant polymers.

[7x2=14 marks]

**Section C**

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. Explain condensation polymerisation with the preparation of PET
16. Write the mechanism of additional polymerization using PVC
17. Explain the preparation of phenol-formaldehyde resins and Bakelite.
18. Explain ring opening polymerisation with an example
19. Explain ionic polymerisation
20. Write a short note on the environmental hazards of plastics and recycling

[4x3=12 marks]

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21. Explain Classification of Polymers on the basis of source, structure, composition and arrangement.
22. Explain the synthetic rubber with three examples
23. Explain different kinds of moulding processes.
24. Write the applications of polymers in different fields.

**Model Question paper for U.G Core Courses (Chemistry)-Theory**

**6B17CHE–D. NANOCHEMISTRY**

**KANNUR UNINERSITY**

Name:  
Reg.No

VI-----Semester

Total marks: 40  
Time: 3hrs.

Answer the questions in English only

**Section A**

(Objective type - Each carries 1 mark -Answer all 4 questions)

1. How many Angstrom units make one nanometre ?
2. What is the title of the speech given by the Physicist Richard Feynman
3. What is SICM ?
4. How many pentagons and hexagons are present in a C<sub>60</sub> fullarene ?

[4x1=4

marks]

**Section B**

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. Explain Nanofabrication using Top-Down and Bottom-Up methods.
6. Suggest a Sonochemical synthetic method for the preparation of nano particles
7. Explain quantum dots with example
8. How nanotechnology plays important role in environment protection ?
9. What are the important applications of nano-optics ?
10. What are the methods adopted for the synthesis of nano polymers ?
11. Explain the phenomenon of Single Electron Tunnelling
12. Write briefly about any two scanning probe instruments
13. Give a short note Ellipsometry
14. What is Nanomagnetism

[7x2=14 marks]

**Section C**

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. Classify nano particles based on dimensions and commercial use
16. Account some chemical methods for the synthesis of nano particles
17. Explain the mechanical, thermal and optical properties of nano particles
18. Write a short note on self assembly of molecules
19. Explain computational nanotechnology
20. Write a short note on different types of nano devices

[4x3=12 marks]

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21. Explain lithography using photolithography technique
22. Suggest some synthetic methods for the formation of nano particles
23. Explain some of medical and electronics application of nano materials.
24. Explain some of the methods for the characterization of nano materials.

**Pattern of Question paper for U.G Complementary Courses (Chemistry)-Theory**

Reg. No.:

Course code:

Name:

-----Semester

Course title.....

Programme.....

Total marks: 32

Time: 3hrs.

write only in English

**Section A**

(very short answer type - Each carries 1 mark -Answer all 5 questions )

- 1.
- 2.
- 3.
- 4.
- 5.

**Section B**

(Short answer type - Each carries 2 mark -Answer 4 questions out of 6 )

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

**Section C**

(Short essay type - Each carries 3 mark -Answer 3 questions out of 5)

- 12.
- 13.
- 14.
- 15.
- 16.

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4 )

- 17.
- 18.
- 19.
- 20.



**Model question Paper**  
**Semester I**  
**Complementary Chemistry**  
For Physical & Biological Sciences 1CO1CHE

Time: 3hrs

Maximum: 32 Marks

SECTION A

Answer *all* questions.

Each question carries the marks of 1

1. Write down the electronic configuration of Cu and Cr.
2. Define faradays second law of electrolysis.
3. Write the equation for cell constant.
4. Define ohms law.
5. Define transport number. (1x5=5marks)

SECTION B

(Answer any *four* questions. Each question carries 2 marks)

6. Derive the de Broglie relation.
7. Distinguish between  $\sigma$  bond and  $\pi$  bond.
8. What are strong electrolytes? Write two examples.
9. How does ionization energy vary along a period?
10. The uncertainty in position of an electron is  $1\text{Å}^0$  What is the uncertainty in velocity (Mass of the electron= $9.1 \times 10^{-31}\text{kg}$ .)
11. Explain Green house effect. (2x4=8marks)

SECTION C

(Answer any *three* questions. Each question carries 3 marks)

12. Write a note on conductometric titration.
13. Explain the causes of global warming?
14. Give the outline of VSEPR theory and using the theory. Explain the shapes of  $\text{XeF}_2$  and  $\text{ClF}_3$ .
15. Explain hydrogen bonding.
16. How is ozone layer naturally formed? Indicate the cause of its depletion and its results of depletion.

(3x3=9marks)

SECTION D

(Answer any *two* questions. Each question carries 5 marks)

17. What are quantum numbers? Discuss the significance of each quantum numbers.
18. Write a note on air pollution.
19. a) Briefly outline the salient features of molecular orbital theory  
b) Give the molecular orbital electronic configuration  $\text{B}_2$  molecules
20. Define Kohlrausch's law of independent migration of ions. Explain its application. (5x2=10marks)

SEMESTER II  
**Complementary Chemistry**  
**For Physical & Biological Science 2CO2CHE**

Time: 3hrs

Maximum: 32 Marks

SECTION A

Answer *all* questions.

Each question carries the marks of 1

1. Define chemical equilibrium.
2. Define Grotthuss-Draper law.
3. Define precision.
4. Define gold number
5. Give two examples for first order reaction. (1x5=5marks)

SECTION B

**(Answer any *four* questions. Each question carries 2 marks)**

6. A first order reaction completes 20% in 20 minutes. What time will it take to complete 60% at the same temperature?
7. Calculate the pH of 0.85M HCl which is 80% ionised
8. What is meant by the quantum yield of photochemical reaction?
9. What are protective colloids? Give two examples for the protective colloids.
10. Explain solubility product.
11. Describe the activated complexes. (2x4=8marks)

SECTION C

**(Answer any *three* questions. Each question carries 3 marks)**

12. Explain the phosphorescence?
13. Write a note on Tyndal effect.
14. Explain the classifications of errors.
15. Write a note on the applications of colorimetry
16. 10 moles of HI were heated in a sealed 5L bulb at 717K till equilibrium state was reached. It was found to that 25% of HI had dissociated by that time. Calculate the equilibrium constant for the reaction  $2\text{HI}_{(g)} \leftrightarrow \text{H}_{2(g)} + \text{I}_{2(g)}$  (3x3=9marks)

SECTION D

(Answer any *two* questions. Each question carries 5marks)

17. Define the principle of mobile equilibrium. Apply it to contact process and Haber process.
18. Explain chromatography
19. a) Derive the integrated rate equation for the rate constant of a first order reaction.  
b) Describe the half life period of determining the order of the reaction
20. Explain (i) electrical double layer. (ii) Zeta potential  
(iii) Isoelectric point

(5x2=10marks)

**SEMESTER III**  
**Complementary Chemistry**  
**For Biological Science 3CO3CHE (BS)**

Time: 3hrs

Maximum: 32 Marks

**SECTION A**

Answer *all* questions.

Each question carries the marks of 1

1. Define copolymers.
2. What is meant by aromaticity?
3. What are ligands?
4. Define specific rotation.
5. What are free radicals? (1x5=5marks)

**SECTION B**

**(Answer any four questions. Each question carries 2 marks)**

6. State and illustrate Hoffman's rule?
7. Give the IUPAC names of  $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$  (ii)  $\text{K}_4[\text{Fe}(\text{CN})_6]$
8. Discuss the second law of thermodynamics.
9. What are the functional groups present in (i) amide (ii) aldehyde (iii) acid chloride (iv) carboxylic acid
10. Explain the chemical method used for the separation of racemic mixture.
11. Explain the relation between  $C_p$  and  $C_v$  (2x4=8marks)

**SECTION C**

**(Answer any three questions. Each question carries 3 marks)**

12. Distinguish between isothermal, isochoric and isobaric process.
13. Explain the difference between thermosetting plastic and thermoplastic?
14. Give the postulates of Werner's coordination theory
15. Explain the structure of benzene.
16. Discuss the  $E_1$  and  $E_2$  mechanism of elimination reaction. (3x3=9 marks)

**SECTION D**

**(Answer any two questions. Each question carries 5 marks)**

17. (a) Explain the types of polymerization  
(b) Write a note on biodegradable polymers.
18. (a) Explain the conformational isomerism with regard to cyclohexane and propane  
(b) Discuss the optical isomerism of tartaric acid
19. (a) What are the electrophilic substitution reactions in benzene?  
(b) Write down the mechanisms in each case?
20. On the basis of VBT, account for the fact that  $[\text{Fe}(\text{CN})_6]^{3-}$  is weakly paramagnetic while  $[\text{Fe}(\text{CN})_6]^{4-}$  is diamagnetic

## SEMESTER III

### Complementary course in chemistry

### 3CO3CHE (PS): FOR PHYSICAL SCIENCE

TIME : 3Hrs

Total marks : 32

Write only in English

#### SECTION A

(Answer all 5 questions, each carries one mark.)

1. Write the structural formula for the compound 3-Chloro-5,5-dimethylhexanal.
2. Name the compound  $[\text{Cr}(\text{NH}_3)_3(\text{H}_2\text{O})_3]\text{Cl}_3$ .
3. Give the mathematical expression for second law of Thermodynamics.
4. Give one example for bi dentate ligand.
5. The most abundant metal in the earth crust.

#### SECTION B

(Answer any 4 questions .each carries 2 marks)

6. Point out any two methods for the concentration of ores.
7. What are the criterions for aromaticity?
8. Define the terms a) mass defect b) n/p ratio
- 9.. Half life period of Th is 24.4 min. How much element would be left after 30 min. If the initial concentration of Th is 1gm?
10. Write a note on multi centric bonds with suitable examples.
11. Differentiate between stokes and anti stokes lines.

#### SECTION C

(Answer any 3 questions: each carries 3 marks)

- 12.(a) Give Gibbs-Helmholtz equation  
(b) Free energy is otherwise called the work function of a system. Justify the statement.
13. What are the significances of electron displacement effects in organic reaction mechanism?
14. Explain the applications of radioisotopes in the medicinal field?
15. Give the structure and bonding in ferrocene.
16. Discuss in detail about chemical shift and spin-spin coupling.

#### SECTION D

(Answer any 2 questions: each carries 5 marks)

17. (a) what are the steps involved in metallurgical process?  
(b) Name the ore of titanium. How will you extract Titanium from that ore?
18. In the lights of VBT theory, explain the complex formation of  $[\text{Fe}(\text{CN})_6]^{4-}$
19. Comment on the uniqueness of benzene. How is it stabilized?
20. Discuss the social issues resulted by the nuclear wastes in the recent years.

SEMESTER IV  
Complementary Chemistry  
For Biological Science **4CO4CHE (BS)**

Time: 3hrs

Maximum: 32 Marks

SECTION A

Answer *all* questions.

Each question carries the marks of 1

1. What are epimers?
2. Give two examples for condensed heterocyclic compounds.
3. Give the chemical names of vitamins A, B<sub>1</sub> and B<sub>2</sub>
4. What are codons?
5. Draw the structures of Adrenaline and Thyroxine.  
(1x5=5marks)

SECTION B

**(Answer any *four* questions. Each question carries 2 marks)**

6. Give one method for the preparation of isoquinoline
8. Explain the types of Hydrogen bonding in DNA
9. Hormones are called chemical messengers. Why?
10. Write a note on paper electrophoresis.
11. What is cis-platin? What are its important uses?  
(2x4=8marks)

SECTION C

**(Answer any *three* questions. Each question carries 3 marks)**

12. What is meant by zwitter ion? How does its electric point influence the properties of the amino acid
13. How will you convert starch into (a) glucose and (b) maltose
14. Explain sodium-potassium pump.
15. Write short note on enzyme deficiency diseases
16. Give the reactions (a) Thiophene react with acetic anhydride in the presence of phosphoric acid  
(b) Oxidation reactions of quinolin (3x3=9 marks)

SECTION D

**(Answer any *two* questions. Each question carries 5marks)**

- 17.(a) Analyse the biochemical functions of hemoglobin and myoglobin  
(b) Briefly explain the role of hemoglobin in the transport of oxygen and carbon dioxide.
18. Explain the mechanism of Michaelis-Menten Theory
19. Explain the colour test for proteins
- 20(a) Explain the structure of furan  
(b) Explain the reactivity and the aspect of orientation in the electrophilic substitution reactions.  
(5x2=10 marks)

SEMESTER IV  
COMPLEMENTARY COURSE IN CHEMISTRY  
4CO4CHE (PS): FOR PHYSICAL SCIENCE

TIME: 3 Hrs

Total Marks:32

SECTION A

Answer all questions Each carries 1 Mark

1. Expand SHE.
2. Give one example for acidic salt.
3. Give one reason for the deviation of gases from ideal behavior.
4. The solutions which are deviating from Raoult's law are called.....
5. Write the Bragg's equation.

SECTION B

ANSWER ANY 4 QUESTIONS: EACH CARRIES 2 MARKS

6. Differentiate between crystalline and amorphous solids.
7. What were the reasons which led van der Waal to modify the ideal gas equation?write down the modified equation.
8. Construct the phase diagram for water.
9. Calculate the hydrolysis constant ( $K_h$ ) and degree of hydrolysis ( $\alpha$ ) of  $\text{NH}_4\text{Cl}$  in 0.001 solution. ( $K_b=1.8\times 10^{-5}$ ;  $K_w=1.0\times 10^{-14}$ )
10. Point out the applications of electro analytical method.
11. State Ostwald dilution law.

SECTION C

(ANSWER ANY 3 QUESTIONS: EACH CARRIES 3 MARKS.)

12. Explain the properties and applications of liquid crystals.
13. Write a note on the working principle of calomel electrode.
14. (a) Distinguish between absolute temperature and critical temperature. (b)  
Calculate the rms velocity for oxygen molecule at  $26.85^\circ\text{C}$  given that gas constant  $R=8.314\times 10^7 \text{ ergs mol}^{-1} \text{ dg}^{-1}$ .
15. Draw and interpret the boiling point diagram of miscible binary mixtures by taking suitable examples
16. Lead-silver system is a two component system. Justify the statement and verify it as simple eutectic.

SECTION D

ANSWER ANY 2 QUESTIONS: EACH CARRIES 5 MARKS

17. (a) Where can you see relaxation effect and electrophoretic effect? What are they?  
(b) Discuss the Debye Huckel theory of strong electrolytes. Give Debye Huckel Onsager equation and explain the terms involved.
18. (a)Expand TGA & DTA.  
(b)Sketch and illustrate the basic instrumentation of UV-Visible spectrophotometry

19. Explain Maxwell distribution of molecular velocity. Give the expressions for rms, average and most probable velocities.
20. (a) Discuss the crystal structure of NaCl.  
(b) Which are the different Bravais lattices of cubic crystals

**Pattern of Question paper for U.G Open Courses (Chemistry)-Theory**

Reg. No.:

Course code:

Name:

-----Semester

Course title.....

Programme.....

Total marks: 20

Time: 2 hrs.

Answers can be written only in English

**Section A**

(very short answer type- Each carries 1 mark -Answer all 5 questions )

- 1.
- 2.
- 3.
- 4.
- 5.

**Section B**

(Short answer type - Each carries 2 mark -Answer 3 questions out of 5 )

- 6.
- 7.
- 8.
- 9.
- 10.

**Section C**

(Short essay type - Each carries 3 mark -Answer 3 questions out of 5)

- 11.
- 12.
- 13.
- 14.
- 15.



SEMESTER V

Reg. No.:  
Name:

Course code: 5D01CHE

Programme: OPEN COURSE

CHEMISTRY IN SERVICE TO MAN

Total marks: 20

Time: 2 hrs.

*Answers can be written only in English*

Section A

(Each carries 1 mark - Answer all 5 questions)

1. Give the chemical ingredients of talcum powder.
2. Write the composition of natural gas.
3. What are antipyretics?
4. What are silicones?
5. What are the raw materials used in the manufacture of glass?

Section B

(Each carries 2 marks - Answer any 3)

6. What is vulcanization of rubber?
7. What are pheromones?
8. Give the characteristic of good fuel?
9. What is Portland cement?
10. What are tranquillizers?

Section C

(Each carries 3 marks - Answer any 3)

11. Give a brief note on classification of drugs, with examples and uses.
12. Write briefly on different types of cells and batteries.
13. What are pesticides? Discuss the environmental hazards due to them.
14. Give the softening methods of drinking water.
15. Give an account of harmful chemicals in cosmetics.

Name:  
Reg No:

Programme: OPEN COURSE

**DRUGS – USE & ABUSE**

**Total marks: 20**

**Time: 2 hrs.**

Answers can be written only in English

Section A

(Each carries 1 mark - Answer all 5 questions)

1. Give the definition of pharmacokinetics.
2. What are inverse agonists?
3. What are Hallucinogens?
4. Give an example for drug acting on central nervous system.
5. What is meant by lethal dose?

Section B

(Each carries 2 marks - Answer any 3)

6. Give an account of treatment in poisoning.
7. Write a note on cardiovascular drugs with examples.
8. What is meant by chemotherapy?
9. Write a short note on enzymes.
10. What are antipyretics and analgesics?

Section C

(Each carries 3 marks - Answer any 3)

11. Give a short note on narcotic drugs and its abuse.
12. What are antibiotics? Give the uses and misuses.
13. Give an account of mode of drug action.
14. Write short note on drugs acting on peripheral nervous system.
15. What are the different types of receptors?

**MODEL QUESTION PAPER**  
**V Semester B.A/B.Sc/B.Com/B.B.A Examination**  
**OPEN COURSE IN CHEMISTRY**  
**5D03CHE Environmental Studies (2014 Admn.)**

Total Marks: 20

Time: 2Hours

(Answer can be written only in English)

Section A

(Very short answer type-Each carries 1mark-Answer all questions)

1. Mention any three effects of noise pollution on people.
2. What is Photochemical smog?
3. What are Occupational hazards?
4. What is meant by Biomass energy?
5. Name any three harmful chemical used in food.

Section B

(Short answer type-Each carries 2 marks-Answer any 3 out of 5)

6. What is meant by COD? Explain the method of determination.
7. Explain the Soil formation.
8. What are fossil fuels? Mention the limitations in using it.
9. Explain Green House Effect.
10. Explain the cause and sources of Itai-Itai disease.

Section C

(Short essay type - Each carries 3 mark -Answer 3 questions out of 5)

11. Explain the major environmental segments with its special features.
12. What are the important sources of water pollution? Explain the control measures.
13. Write notes on :
  - a. Bioaccumulation
  - b. Bioinformatics
14. Explain acid rain with its environmental impact.
15. What are the important sources of noise pollution? Explain the harmful effects on human beings.

**SEMESTER V**

**Name:**  
**Reg No:**

**Programme: OPEN COURSE**

**5D04CHE NANOMATERIALS**

**Total marks: 20**  
**Time: 2 hrs.**

Answers can be written only in English

Section A

(Each carries 1 mark - Answer all 5 questions)

1. What are spintonics?
2. What is nanomagnetism?
3. Give one use of nanomaterial in robotics.
4. What are carbon nanotubes?
5. What are quantum dots?

Section B

(Each carries 2 marks - Answer any 3)

6. Discuss the sot gel synthesis of nanoparticles
7. Discuss catalysis using nanomaterials.
8. Give the uses of nanomaterials in computer and mobile electronic devices.
9. Give an account of computational nanotechnology.
10. Give a note on medicinal application of nanomaterials.

Section C

(Each carries 3 marks - Answer any 3)

11. Discuss the photochemical synthesis and electro chemical synthesis of nanomaterials.
12. Give an account on characterization of nanomaterials.
13. Discuss the conductivity and enhanced catalytic activity using nanomaterials compared to macro state particles.
14. Write a note on nanobiotechnology.
15. Explain the use of nanomaterials in solar energy conversion and storage



(Abstract)

M A Programme in English Language & Literature Programme under Credit Based Semester System in affiliated colleges – Revised Scheme, Syllabus and Pattern of Question Papers -Implemented with effect from 2016 admission- Orders issued.

**ACADEMIC C SECTION**

U.O.No.Acad/C3/13141/2014

Civil Station P.O, Dated,15 -07-2016.

- Read : 1. U.O.No.Acad/C1/11460/2013, dated, 12-03-2014, 05.12.2015 & 22.02.2016,  
2. U.O of even No dated 20.10.2014  
3. Meeting of the Board of Studies in English(PG) held on 06-05-2016,  
4. Meeting of the Board of Studies in English(PG) held on 17-06-2016.  
5. Letter dated 27.06.2016 from the Chairman, Board of Studies in English(PG)

**ORDER**

1. The Regulations for P.G Programmes under Credit Based Semester System were implemented in the University with effect from 2014 admission vide paper read (1) above dated 12.03.2014 & Certain modifications were effected to the same dated 05.12.2015 & 22.02.2016 respectively.
2. As per paper read (2) above, the Scheme, Syllabus & Pattern of question papers for M A Programme in English Language and Literature under Credit Based Semester System in affiliated Colleges were implemented in the University w.e.f. 2014 admission.
3. The meeting of the Board of Studies in English(PG) held on 06-05-2016, as per paper read (3) above, decided to revise the syllabus for M A Programme in English Language and Literature w.e.f. 2016 admission & as per paper read (4) above the Board of Studies finalized and recommended the scheme, syllabus and Pattern of question papers for M A Programme in English Language and Literature for implementation with effect from 2016 admission.
4. As per the paper read (5) above, the Chairman, Board of Studies in English (PG) has forwarded the finalized copy of the Scheme, Syllabus & Pattern of question Papers for M A Programme in English Language and Literature for implementation with effect from 2016 admission.
5. The Vice-Chancellor, after considering the matter in detail, and in exercise of the powers of the Academic Council, as per Section 11 (1) of Kannur University Act, 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised Scheme, Syllabus & Pattern of question Papers for M A Programme in English Language and Literature as recommended by the Board of Studies, under Credit Based Semester System in affiliated colleges with effect from 2016 admission.

6.Orders are therefore issued, implementing the revised Scheme , Syllabus & Pattern of Question Papers for M A Programme in English Language and Literature under Credit Based Semester System in affiliated Colleges with effect from 2016 admission, subject to report to the Academic Council.

7.The implemented Scheme, Syllabus & Pattern of Question Papers are appended here with.

Sd/-

JOINT REGISTRAR (ACADEMIC)

For Registrar

To:

The Principals of Affiliated Colleges Offering MA English Language and Literature Programme.

Copy to:

- 1.The Examination Branch
2. The Chairman, Board of Studies in English (PG)
3. PS to VC/PA to PVC/PA to Registrar/PA to CE.
4. JR/AR-I (Academic).
- 5.The Computer Programmer (with a request to upload the Website)
6. SF/DF/FC



Forwarded /By Order

SECTION OFFICER

A handwritten signature in black ink, appearing to be 'A. J. S.', written over the printed name 'SECTION OFFICER'.

- For more details log on to [www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in)

**APPENDIX TO U.O.NO.ACAD/C3/13141/2014 DATED 15.07.2016**



# **KANNUR UNIVERSITY**

## **M. A. PROGRAMME IN ENGLISH LANGUAGE AND LITERATURE**

### **CREDIT BASED SEMESTER SYSTEM IN AFFILIATED COLLEGES**

#### **REVISED SCHEME & SYLLABUS**

**2016 ADMISSION ONWARDS**

**M. A. PROGRAMME IN ENGLISH LANGUAGE AND  
LITERATURE (CCSS)**

**REVISED SYLLABUS – 2016 ADMISSION ONWARDS**

(To be followed in the affiliated colleges under Kannur University)

**SEMESTER 1—Four Core Courses and one Elective (select one among three)**

| Semester | Course Code  | Title                                                                                                                         | Internal   | External   | Total      | Credit    | Hours     |
|----------|--------------|-------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|-----------|-----------|
| <b>I</b> | ENG 1C01     | British Literature: Chaucer to Seventeenth Century                                                                            | 20         | 80         | 100        | 4         | 5         |
|          | ENG 1C02     | British Literature: Eighteenth Century                                                                                        | 20         | 80         | 100        | 4         | 5         |
|          | ENG 1C03     | Literary Criticism                                                                                                            | 20         | 80         | 100        | 4         | 5         |
|          | ENG 1C04     | History and Structure of English Language                                                                                     | 20         | 80         | 100        | 4         | 5         |
|          | ENG 1E01     | <b>Elective</b> (Choose one among three)<br>Malayalam Literature in Translation<br>Media Studies<br>English Language Teaching | 20         | 80         | 100        | 4         | 5         |
|          | ENG 1E02     |                                                                                                                               |            |            |            |           |           |
|          | ENG 1E03     |                                                                                                                               |            |            |            |           |           |
|          | <b>TOTAL</b> |                                                                                                                               | <b>100</b> | <b>400</b> | <b>500</b> | <b>20</b> | <b>25</b> |

**SEMESTER 2—Three Core Courses and one Elective (select one among three)**

| Semester  | Course Code | Title                                                                                            | Internal | External  | Total      | Credit     | Hours     |
|-----------|-------------|--------------------------------------------------------------------------------------------------|----------|-----------|------------|------------|-----------|
| <b>II</b> | ENG 2C05    | Literature of the Romantic Period                                                                | 20       | 80        | 100        | 4          | 7         |
|           | ENG 2C06    | Literature of the Victorian Period                                                               | 20       | 80        | 100        | 4          | 7         |
|           | ENG 2C07    | Modern Literary Theory                                                                           | 20       | 80        | 100        | 4          | 6         |
|           | ENG 2E04    | <b>Elective</b> (Choose one among three)<br>Translation Studies<br>World Drama<br>Dalit Writings | 20       | 80        | 100        | 4          | 5         |
|           | ENG 2E05    |                                                                                                  |          |           |            |            |           |
|           | ENG 2E06    |                                                                                                  |          |           |            |            |           |
|           |             | <b>TOTAL</b>                                                                                     |          | <b>80</b> | <b>320</b> | <b>400</b> | <b>16</b> |



**SEMESTER 3—Four Core Courses and one Elective (select one among three)**

| Semester   | Course Code                      | Title                                                                                                                                      | Internal   | External   | Total      | Credit    | Hours     |
|------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|-----------|-----------|
| <b>III</b> | ENG 3C 08                        | Twentieth Century British Literature                                                                                                       | 20         | 80         | 100        | 4         | 6         |
|            | ENG 3C09                         | Linguistics                                                                                                                                | 20         | 80         | 100        | 4         | 4         |
|            | ENG 3C10                         | Indian Writing in English                                                                                                                  | 20         | 80         | 100        | 4         | 5         |
|            | ENG 3C11                         | American Literature                                                                                                                        | 20         | 80         | 100        | 4         | 6         |
|            | ENG 3E07<br>ENG 3E08<br>ENG 3E09 | <b>Elective</b> (Choose one among three)<br>Introduction to Cultural Studies<br>European Fiction<br>Introduction to Comparative Literature | 20         | 80         | 100        | 4         | 4         |
|            | <b>TOTAL</b>                     |                                                                                                                                            | <b>100</b> | <b>400</b> | <b>500</b> | <b>20</b> | <b>25</b> |

**SEMESTER 4—Six Core Courses including Project Work and Viva-voce**

| Semester  | Course Code | Title                 | Internal | External   | Total      | Credit     | Hours     |
|-----------|-------------|-----------------------|----------|------------|------------|------------|-----------|
| <b>IV</b> | ENG 4C 12   | Postcolonial Writings | 20       | 80         | 100        | 4          | 6         |
|           | ENG 4C 13   | Women's Writing       | 20       | 80         | 100        | 4          | 6         |
|           | ENG 4C 14   | Film Studies          | 20       | 80         | 100        | 4          | 6         |
|           | ENG 4C 15   | Comprehension         | 20       | 80         | 100        | 4          | 4         |
|           | ENG PR 16   | Project               | 20       | 80         | 100        | 4          | 3         |
|           | ENG 4C 17   | Viva-Voce             | 00       | 100        | 100        | 4          | 0         |
|           |             | <b>TOTAL</b>          |          | <b>100</b> | <b>500</b> | <b>600</b> | <b>24</b> |

**Details of Marks, Credit and Hours**

|                     |                                                                                                                                                                                |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Internal Assessment | 380 (Maximum 20 marks for a course. Test Paper: 5 Marks; Assignment: 5 Marks; Seminar/Viva: 5 Marks Attendance: 5 Marks)<br>Comprehension Course Internal (20 marks oral test) |
| External Evaluation | 1620                                                                                                                                                                           |
| Total Marks         | 2000                                                                                                                                                                           |
| Total Credits       | 80                                                                                                                                                                             |
| Total Hours         | 25 per week                                                                                                                                                                    |

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**M. A. PROGRAMME IN ENGLISH LANGUAGE AND  
LITERATURE (CCSS)**

**REVISED SYLLABUS – 2016 ADMISSION ONWARDS**

(To be followed in the affiliated colleges under Kannur University)

**SEMESTER 1—Four Core Courses and one Elective (select one among three)**

| Semester     | Course Code | Title                                                                                                                         | Internal   | External   | Total      | Credit    | Hours     |
|--------------|-------------|-------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|-----------|-----------|
| <b>I</b>     | ENG 1C01    | British Literature: Chaucer to Seventeenth Century                                                                            | 20         | 80         | 100        | 4         | 5         |
|              | ENG 1C02    | British Literature: Eighteenth Century                                                                                        | 20         | 80         | 100        | 4         | 5         |
|              | ENG 1C03    | Literary Criticism                                                                                                            | 20         | 80         | 100        | 4         | 5         |
|              | ENG 1C04    | History and Structure of English Language                                                                                     | 20         | 80         | 100        | 4         | 5         |
|              | ENG 1E01    | <b>Elective</b> (Choose one among three)<br>Malayalam Literature in Translation<br>Media Studies<br>English Language Teaching | 20         | 80         | 100        | 4         | 5         |
|              | ENG 1E02    |                                                                                                                               |            |            |            |           |           |
|              | ENG 1E03    |                                                                                                                               |            |            |            |           |           |
| <b>TOTAL</b> |             |                                                                                                                               | <b>100</b> | <b>400</b> | <b>500</b> | <b>20</b> | <b>25</b> |

**ENG 1C01**

**BRITISH LITERATURE: CHAUCER TO SEVENTEENTH CENTURY**

**Module 1**

**Background**

English Renaissance and Religious Reformation

Geographical Explorations

Puritan Interregnum and Restoration Literature

Romantic comedy, Comedy of Manners, Comedy of Humours

**Module 2-Poetry**

**Detailed**

|                     |   |                                                                                                             |
|---------------------|---|-------------------------------------------------------------------------------------------------------------|
| Sir Philip Sydney   | : | Sonnet No.1 from <i>Astrophel and Stella</i>                                                                |
| William Shakespeare | : | Sonnet 60, Like the waves make towards the pebbled shore<br>Sonnet 55 ‘Not marble nor the gilded monuments’ |
| Edmund Spenser      | : | Prothalamion                                                                                                |
| John Donne          | : | A Valediction Forbidding Mourning, Death Be Not Proud (Holy Sonnet X)                                       |
| Andrew Marvell      | : | To His Coy Mistress                                                                                         |

**Non-Detailed**

|                   |   |                                                                                     |
|-------------------|---|-------------------------------------------------------------------------------------|
| Geoffrey Chaucer  | : | <i>The General Prologue to The Canterbury Tales</i> (lines 1-100) in Middle English |
| Robert Herrick    | : | To the Virgins to Make Much of Time                                                 |
| George Herbert    | : | The Collar                                                                          |
| Katherine Philips | : | A Married State                                                                     |

John Bunyan : Upon Over-Much Niceness

John Milton : Paradise Lost Book IX

John Dryden : Mac Flecknoe

### Module 3

#### Prose

Francis Bacon : Of Superstition

Margaret Cavendish : The Description of a New World, Called The Blazing World

John Locke : The Epistle to the Reader from *An Essay Concerning Human Understanding* (Para 1, 2 & 3)

Aphra Behn : *Ornooko; or, The Royal Slave* (Norton Anthology Vol. C, pp. 2313 to 2329)

Samuel Pepys : The Great fire from *The Diary* (September 2, 1666)

### Module 4

#### Drama

William Shakespeare : *Hamlet (Detailed)*

Christopher Marlowe : *Doctor Faustus*

William Congreve : *The Way of the World*

### Suggested Reading

*The Norton Anthology of English Literature* (Topics: The Middle Ages, 16<sup>th</sup> Century, Early 17<sup>th</sup> Century)

A. W. Ward, A. R. Waller (Eds.) *The Cambridge History of English Literature*

Arthur F Kinney *The Cambridge Companion to English Literature, 1500-1600*

John Lennard *The Poetry Handbook*

Margaret Drabble *The Oxford Companion to English literature*

A. R. Braunmuller *The Cambridge Companion to English Renaissance Drama*

John E. Stevens *Medieval Romance: Themes and Approaches*

Deborah Payne Fisk *The Cambridge Companion to English Restoration Theatre*

G. Wilson Knight *The Wheel of Fire: Interpretations of Shakespearean Tragedy*

Thomas N. Corns *The Cambridge Companion to English Poetry, Donne to Marvell*

George Parfitt *English Poetry of the Seventeenth Century, 1590-1700*

Kalyani Vallath *A Contemporary Encyclopedia of British Literature, Vol I*

Web Resources:

<http://www.bartleby.com/cambridge> (The Cambridge History of English and American Literature—An Encyclopedia in Eighteen Volumes)

Literature.org (The Online Literature Library)

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 2 | (10 marks) |
| (c) One essay of 350 words out of two from Module 3 | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 | (10 marks) |

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems),  
Module 3 and Module 4 (4 X 5 = 20 marks)

## ENG 1C02 BRITISH LITERATURE: EIGHTEENTH CENTURY

### Module 1

#### Bakground

The Age of Enlightenment

Urbanisation and Industrialisation of England

Periodical Literature

The Rise of the Novel

### Module 2

#### Poetry (Detailed)

|                 |   |                                |
|-----------------|---|--------------------------------|
| Anne Finch      | : | A Nocturnal Reverie            |
| Alexander Pope  | : | The Rape of the Lock (Canto 2) |
| William Collins | : | Ode to Evening                 |
| William Blake   | : | The Tyger; The Lamb            |

#### (Non-Detailed)

|                  |   |                                        |
|------------------|---|----------------------------------------|
| Robert Burns     | : | To a Mouse                             |
| Oliver Goldsmith | : | The Deserted Village (lines 1 to 96)   |
| Thomas Gray      | : | Elegy Written in a Country Church-yard |

### Module 3

#### Prose and Novel

|                |   |                                               |
|----------------|---|-----------------------------------------------|
| Jonathan Swift | : | Gulliver's Travels                            |
| Henry Fielding | : | Tom Jones                                     |
| Daniel Defoe   | : | Robinson Crusoe                               |
| Richard Steele | : | The Spectator's Club (The Spectator<br>No. 2) |
| Charles Lamb   | : | Dream Children; Old China                     |

### Module 4

#### Drama

|                  |   |                                           |
|------------------|---|-------------------------------------------|
| Oliver Goldsmith | : | She Stoops to Conquer ( <b>Detailed</b> ) |
| Richard Sheridan | : | The Rivals                                |

### Suggested Reading

Paul Poplawski *English Literature in Context*.

*The Norton Anthology of English Literature*. (Topics: Restoration and the Eighteenth Century)

Eds. A. W. Ward, A. R. Waller *The Cambridge History of English Literature*

Richard W. Bevis *English Drama Restoration and Eighteenth Century, 1660-1789*

John Richetti *The Cambridge Companion to the Eighteenth-Century Novel*

Clive T. Probyn *English Fiction of the Eighteenth Century, 1700-1789*

Adrian Poole *The Cambridge Companion to English Novelists*

Ian Watt *The Rise of the Novel: Studies in Defoe, Richardson and Fielding*

Margaret Drabble *The Oxford Companion to English Literature*

John Sitter *The Cambridge Companion to Eighteenth-Century Poetry*

Web Resources:

<http://www.bartleby.com/cambridge> (The Cambridge History of English and American Literature—An Encyclopedia in Eighteen Volumes)  
Literature.org (The Online Literature Library)

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

#### I Essay (40 marks)

- (a) One essay of 350 words out of two from Module 1 (10 marks)
- (b) One essay of 350 words out of two from Module 2 (10 marks)
- (c) One essay of 350 words out of two from Module 3 (10 marks)
- (d) One essay of 350 words out of two from Module 4 (10 marks)

**II** Four out of six annotation questions (80 words) from the poems and drama prescribed for detailed study in Module 2 and Module 4 respectively. (4 X 5 = 20 marks)

**III** Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4. (4 X 5 = 20 marks)

## ENG 1C03 LITERARY CRITICISM

### Module 1

Introduction to:

1. Classical Criticism and Neoclassical Criticism
2. Philosophical roots of Romanticism
3. British Romanticism
4. Objective Criticism

### Module 2

|               |   |                                                            |
|---------------|---|------------------------------------------------------------|
| Suresh Joshi  | : | On Interpretation (From Indian Literary Criticism-GN Devy) |
| Aristotle     | : | <i>Poetics</i>                                             |
| Longinus      | : | <i>On the Sublime</i>                                      |
| Philip Sidney | : | <i>Apology for Poetry</i> *                                |
| John Dryden   | : | Essay of Dramatic Poesy*                                   |
| Dr Johnson    | : | Preface to Shakespeare*                                    |

### Module 3

|                    |   |                                  |
|--------------------|---|----------------------------------|
| William Wordsworth | : | Preface to Lyrical Ballads*      |
| S.T. Coleridge     | : | Biographia Literaria (ch14 &17)* |

### Module 4

|               |   |                                            |
|---------------|---|--------------------------------------------|
| Mathew Arnold | : | The study of Poetry*                       |
| Walter Pater  | : | From Studies to the History of Renaissance |

(in *Norton Anthology of Theory & Criticism*)

\*(in D.J.Enright & Ernst De Chickera, *English Critical Texts*)

### Suggested Reading

M.H. Abrams *The Mirror and the Lamp* (Ch.1)

Harry Blamiers *A History of Literary Criticism*  
M.S. Nagarajan *English Literary Criticism and Theory*  
William K. Wimsatt & Cleanth Brooks *Literary Criticism: A Short History*

**Question paper pattern**

**Duration: 3 Hrs**

**Maximum Marks: 80**

**I Essay (40 marks)**

- (a) One essay of 350 words out of two from Module 1 (10 marks)
- (b) One essay of 350 words out of two from Module 2 (10 marks)
- (c) One essay of 350 words out of two from Module 3 (10 marks)
- (d) One essay of 350 words out of two from Module 4 (10 marks)

**II Eight out of ten paragraph questions (100 words) from all modules**

(8 X 5 = 40 marks)

**ENG 1C04**  
**HISTORY AND STRUCTURE OF ENGLISH LANGUAGE**

**Module 1**

**Introduction**

The indo-European family of languages – The Teutonic/Germanic family – place of English in the family – Origin and important landmarks in the history of English language.

**Module 2**

**The Old English Period**

The birth of Old English –Dialects – Characteristic features – Vocabulary and grammar– Literature.

**Module 3**

**The Middle English Period**

The Norman Conquest – General characteristics – Grammar and vocabulary – Dialects – Foreign influences and borrowings (Celtic, Latin, Greek, French, Scandinavian) – Evolution of Standard English – Middle English Literature.

**Module 4**

**The Modern English Period**

The making of modern English – Influence of Renaissance, Printing, and Bible Translations – Grammar and vocabulary changes – Individual contributions of Shakespeare—Milton.

**Module 5**

**Contemporary English Language**

English as a Global language – Varieties (RP, US, Chinese, and Indian) – Pidgin, Creole – Computer, internet and the spread of English language – English as global lingua franca.

**Suggested Reading**

Albert C. Baugh *A History of the English Language*  
C.L. Wren *The English Language*  
George Leslie Brooks *English Dialects*

Otto Jespersen *Growth and Structure of the English Language*  
 George Yule *The Study of Language, 5th Edition*  
 Randolph Quirk *The Use of English*  
 Logan P. Smith *The English Language*  
 David Crystal *Language Death*  
 Patricia Friedrich, Eduardo H. Diniz De Figueiredo: *The Sociolinguistics of Digital Englishes*  
 Jack C. Richards *New Varieties of English: Issues and Approaches*

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

#### I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 2 | (10 marks) |
| (c) One essay of 350 words out of two from Module 3 | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 | (10 marks) |

#### II Eight out of ten paragraph questions (100 words) from all modules.

(8 X 5 = 40 marks)

## ENG 1E01

### MALAYALAM LITERATURE IN TRANSLATION

#### Module 1

##### Background

- |                   |   |                                                                                                                                                                         |
|-------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V. Aravindakshan  | : | “The Literary Tradition of Kerala” (from <i>Essays on the Cultural Formation of Kerala</i> Ed. P.J. Cherian, Kerala State Gazetteer, Vol. IV, Part II, 1999, pp. 65-98) |
| N.P. Mohamed      | : | “Short in Genre, Long in History” ( <i>Indian Literature</i> , Vol. 36, No. 3, May-June 1993, pp. 182-186)                                                              |
| Sunny M. Kapikkad | : | “The Dalit Presence in Malayalam Literature” ( <i>The Oxford India Anthology of Malayalam Dalit Writing</i> by M Dasan et al)                                           |

#### Module 2

##### Poetry

##### Detailed

- |               |   |                                              |
|---------------|---|----------------------------------------------|
| Kumaran Asan  | : | The Fallen Flower                            |
| Ullur         | : | Music of Lovens (Trans. C.A. Joseph)         |
| Vylopilli     | : | The Tear-Fields (Trans. V.C. Harris)         |
| O.N.V. Kurup  | : | Blue Fish (Trans. K.M.George)                |
| Vijayalakshmi | : | Bhagavatham (Trans. Satchidanadan, Haritham) |

##### Non-Detailed

- |                |   |                                                    |
|----------------|---|----------------------------------------------------|
| S. Joseph      | : | Group Photo (Trans. Satchidanadan, in Dasan et al) |
| Sugatha Kumari | : | Colossus                                           |
| Veerankutty    | : | In the Sanatorium for Trees (Trans. K.M.           |

Thottam Pattu : Sherrif  
 Thottam on Pottan – Section I (Trans. K.M. Tharakan, in *The Sacred in Popular Hinduism* by A. A. Abraham, Pub. The Christian Literature Society, Madras, 1983, pp. 170-177)

### Module 3

#### Fiction

O. Chandu Menon : *Indulekha* (Trans. Anitha Devasia, OUP)  
 Thakazhi : *Chemmeen* (Trans. T.S. Pillai)  
 Basheer : *Me Grandad 'ad an Elephant* (Trans. R.E. Asher, Mathrubhoomi Books)  
 O.V. Vijayan : *The Legends of Khasak* (Author, Penguin)  
 N.S. Madhavan : "The Fourth World" (Trans. A.J. Thomas, *Indian Literature*, Vol. 36, No. 3, May-June 1993, pp. 111-122)  
 M.T. Vasudevan Nair : "Sherlock" (Trans. Gita Krishnankutty, Penguin)  
 Sarah Joseph : "Inside Every Woman Writer" (Trans. V.C. Harris, *Indian Literature*, Vol. 36, No. 3, May-June 1993, pp. 94-100)  
 Sithara S : "Fire" (Trans. R.K. Jayasree, Women Unlimited)

### Module 4

#### Drama

G. Sankara Pillai : *Bharathavakyam (Detailed)*  
 K.J. Baby : *Nadugadhika* (Trans. Shirly M. Joseph)

### Suggested Reading

K M Tharakan (Ed.) *Malayalam Poetry Today: An Anthology*.  
 K.M. George (Ed.) *A Survey of Malayalam Literature*  
 Rita Kothari *The Cultural Politics of English*  
 E.V. Ramakrishnan *Locating Indian Culture: Texts, Traditions, Translations*  
*Malayalam Literary Survey* (English journal on Malayalam Literature, published by Sahithya Akademi, Thrissur)

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

#### I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 2 | (10 marks) |
| (c) One essay of 350 words out of two from Module 3 | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 | (10 marks) |

**II** Four out of six annotation questions (80 words) from the poems and drama prescribed for detailed study in Module 2 and Module 4 respectively. (4 X 5 = 20 marks)



**III** Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems),  
Module 3 and Module 4. (4 X 5 = 20 marks)

## **ENG 1E02 MEDIA STUDIES**

### **Module I**

#### **Background**

Mass Media—main effects and functions.

Media Culture

Media in transition

Cyberculture

The Psychodynamics of social networking

### **Module 2**

From orality to print—print media—the technologising of the word—the rise of modern mass media—reconfiguring of narratives—the mediasation of culture—media effects—folk and traditional media—books—pamphlets—magazines--newspapers—advocacy journalism—broadcast journalism—citizen journalism—participatory journalism—data journalism—drone journalism—gonzo journalism—interactive journalism—investigative journalism--photojournalism—sensor journalism—tabloid journalism or yellow journalism (or sensationalism).

### **Module 3**

Hypertext—theatre and theatricality—the rise of popular sensationalism—culture industry—media and advocacy—infotainment—docutainment—internet culture—low culture—mediated communication—social values—media ecology—representation, technologies of representation and new media; media production—mainstream media and alternative media.

### **Module 4**

Digital media—Internet and mobile mass communication—Video games—Audio recording and reproduction—Blogs--RSS feeds—Podcasts—email—social media sites, websites and Internet-based radio and television—linking to or running TV ads online, or distributing QR codes in outdoor or print media—narrative form in mass broadcast media—electronic transmission of information—film, radio, recorded music, television. Outdoor media—AR advertising; billboards; blimps; flying billboards placards—kiosks—cross-media-software publishing—professional and ethical issues and criticism.

### **Suggested Reading**

Marshall McLuhan, *Understanding Media: The Extensions of Man*.

James Carey, "Mass Communication and Cultural Studies," in *Communication as Culture: Essays on Media and Society*

William J. Mitchell, "How to Do Things with Pictures," in *The Reconfigured Eye: Visual Truth in the Post-Photographic Era*.

John Fiske and John Hartley, "Bardic Television," in *Reading Television*.

David Thorburn, "Television as an Aesthetic Medium," *Critical Studies in Mass Communication* 4 (1987), 167-173.

Walter J. Ong, "Some Psychodynamics of Orality," in *Orality and Literacy: the technologizing of the word*.

George Landow, "Reconfiguring Narrative," *Hypertext*  
 Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," in *Illuminations* (New York, 1969)  
 Leo Charney and Vanessa R. Schwartz (ed.) *Cinema and the Invention of Modern Life*  
 Tom Gunning, "An Aesthetic of Astonishment: Early Film and the (In)Credulous Spectator," in Linda Williams (ed.) *Viewing Positions: Ways of Seeing Film*  
 Pierre Bourdieu *On Television*  
 Uttara Manohar *Different Types of Mass Media*  
 Slavko Splichal, "In Pursuit of Socialized Press". In Berry, David & Theobald John. *Radical Mass Media Criticism: A Cultural Genealogy*.  
 John Nerone "Approaches to Media History". In Valdivia, Angharad N. *A Companion to Media Studies*.  
 Asa Briggs, & Peter Burke *Social History of the Media: From Gutenberg to the Balkaran, Stephen (October 1999). "Mass Media and Racism" The Yale Political Quarterly*.  
 John R Downing ( Ed.) *The SAGE Handbook of Media Studies*.  
 Nicholas John Cull, David Culbert and David Welch, eds. *Mass Persuasion: A Historical Encyclopedia, 1500 to the Present*  
 Pieter Fourie J *Media Studies: Media History, Media and Society*.

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

#### I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 2 | (10 marks) |
| (c) One essay of 350 words out of two from Module 3 | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 | (10 marks) |

#### II Eight out of ten paragraph questions (100 words) from all modules

(8 X 5 = 40 marks)

## ENG 1E03 ENGLISH LANGUAGE TEACHING

### Module 1: History, Theory, and Practices of ELT

History of English Language Teaching – Major approaches and methods in ELT –Teaching LSRW skills – English for specific purposes – Teaching English in multilingual societies – Research Trends in second language acquisition.

### Module 2: Recent Trends in ELT

Major trends in twentieth-century ELT practices–ICT and Communication–CT Tools–Internet, smart phones, smart classroom, web resources, online teaching, learning, and assessment, e-content development, e-publishing, education portals – Developing blogs and websites – Free online services (MOOC, Edx, Coursera).

### Module 3: ELT in India

Teaching of English in India – Objectives, methods and materials – Problems and solutions – status of English in India – Link language and official language –Language policies of the government.

## Module 4: The Politics of ELT

Braj B. Kachru  
Robert Phillipson

“English as an Asian Language”  
“The colonial linguistic inheritance” (Chapter 5  
of *Linguistic Imperialism*)  
“Resistance to English in historical Perspective”  
(Chapter 3 of *Resisting Linguistic Imperialism  
in English Teaching*)

A. Suresh Canagarajah

### Suggested Reading

|                                           |                                                                                               |
|-------------------------------------------|-----------------------------------------------------------------------------------------------|
| H. H. Stern                               | <i>Fundamental Concepts of Language Teaching</i>                                              |
| A. P. R. Howatt                           | <i>A History of English Language Teaching</i>                                                 |
| Wilga Rivers                              | <i>Teaching Foreign Language Skills.</i>                                                      |
| S. Krashen                                | <i>Principles and Practice in Second Language Learning</i>                                    |
| Richards and Rodgers                      | <i>Approaches and Methods in Language Teaching.</i>                                           |
| R. K. Agnihotri &<br>A. L. Khanna         | <i>English Language Teaching in India.</i>                                                    |
| David P. Harris                           | <i>Teaching English as a Second Language</i>                                                  |
| Y. P. Lee                                 | <i>New Directions in Language Testing</i>                                                     |
| Harold V. Allen                           | <i>Teaching English as a Second Language</i>                                                  |
| Geoffrey Leech &<br>Christopher           | <i>Computers in English Language Teaching and Research</i>                                    |
| N. S. Prabhu                              | <i>Second Language Pedagogy</i>                                                               |
| Jack. C. Richards and<br>Theodore Rodgers | <i>Approaches and Methods in Language Teaching</i>                                            |
| Sashi Ghosh & Das                         | <i>Introduction to English Language Teaching Vol. 3 Methods at<br/>the College Level, OUP</i> |
| Robert Phillipson                         | <i>Linguistic Imperialism</i>                                                                 |
| Suresh A. Canagarajah                     | <i>Resisting Linguistic Imperialism in English Teaching</i>                                   |

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

#### I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 2 | (10 marks) |
| (c) One essay of 350 words out of two from Module 3 | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 | (10 marks) |

#### II Eight out of ten paragraph questions (100 words) from all modules

(8 X 5 = 40 marks)

**SEMESTER 2—Three Core Courses and one Elective (select one among three)**

| Semester  | Course Code    | Title                                    | Internal  | External   | Total      | Credit    | Hours     |
|-----------|----------------|------------------------------------------|-----------|------------|------------|-----------|-----------|
| <b>II</b> | ENG 2C05       | Literature of the Romantic Period        | 20        | 80         | 100        | 4         | 7         |
|           | ENG 2C06       | Literature of the Victorian Period       | 20        | 80         | 100        | 4         | 7         |
|           | ENG 2C07       | Modern Literary Theory                   | 20        | 80         | 100        | 4         | 6         |
|           |                | <b>Elective</b> (Choose one among three) |           |            |            |           |           |
|           | ENG 2E04       | Translation Studies                      | 20        | 80         | 100        | 4         | 5         |
|           | ENG 2E05       | World Drama                              |           |            |            |           |           |
| ENG 2E06  | Dalit Writings |                                          |           |            |            |           |           |
|           | <b>TOTAL</b>   |                                          | <b>80</b> | <b>320</b> | <b>400</b> | <b>16</b> | <b>25</b> |

**ENG 2C05**

**LITERATURE OF THE ROMANTIC PERIOD**

**Module 1**

**Background**

The French Revolution and its impact on English literature

Class, Power and Politics

Nationhood and Empire

The abolition of slavery—Slave narratives

**Module 2**

**Poetry**

**(Detailed)**

William Wordsworth : Intimations of Immortality

ST Coleridge : Frost at Midnight

Lord Byron : She Walks in Beauty

PB Shelley : Mutability

John Keats : Ode to a Nightingale

**(Non-Detailed)**

William Wordsworth : A Poet's Epitaph

Thomas Gray : Elegy Written in a Country Church-yard

Robert Southey : After Blenheim

ST Coleridge : The Rime of the Ancient Mariner

Walter Scott : County Guy

**Module 3**

**Prose**

Olaudah Equiano : The Interesting Narrative (from Chapter 4 and 5; pp. 102-105, The Norton Anthology. (Vol. D)

Mary Wollstonecraft : From A Vindication of the Rights of

Thomas De Quincey : Woman (Introduction: Norton Anthology;  
(Vol. A)  
On the Knocking at the Gate in Macbeth

#### **Module 4**

##### **Novel**

Jane Austen : *Mansfield Park*

Mary Shelley : *Frankenstein*

Walter Scott : *Ivanhoe*

##### **Suggested Reading:**

*Norton Anthology of English Literature. The Romantic Period (Volume D)*

Paul Poplawski *English Literature in Context*

Thomas Keymer *The Cambridge Companion to English Literature, 1740–1830*

C.M. Bowra *The Romantic Imagination*

Nicholas Roe *Romanticism: An Oxford Guide*

Stuart Curran *The Cambridge Companion to British Romanticism*

Fred Botting *Gothic*

James Chandler *The Cambridge Companion to British Romantic Poetry*

James Chandler *The Cambridge History of English Romantic Literature*

Aidan Day *Romanticism*

Lucy Newlyn *The Cambridge Companion to Coleridge*

#### **Question paper pattern**

**Duration: 3 Hrs**

**Maximum Marks: 80**

##### **I Essay (40 marks)**

- (a) One essay of 350 words out of two from Module 1 (10 marks)
- (b) One essay of 350 words out of two from Module 2 (10 marks)
- (c) One essay of 350 words out of two from Module 3 (10 marks)
- (d) One essay of 350 words out of two from Module 4 (10 marks)

**II** Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2. (4 X 5 = 20 marks)

**III** Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4. (4 X 5 = 20 marks)

### **ENG 2C06**

## **LITERATURE OF THE VICTORIAN PERIOD**

#### **Module 1**

##### **Background**

Reform and Society

The Consumption of Literature and the Literary Marketplace

Science, Nature and Crises of Faith

Victorian Morality and the Decay of Values

## Module 2

### Poetry (Detailed)

|                            |   |                                          |
|----------------------------|---|------------------------------------------|
| Elizabeth Barrett Browning | : | Sonnet 22                                |
| Alfred Tennyson            | : | Ulysses                                  |
| Matthew Arnold             | : | Dover Beach                              |
| GM Hopkins                 | : | As Kingfishers Catch Fire<br>Pied Beauty |

### (Non-Detailed)

|                    |   |                                         |
|--------------------|---|-----------------------------------------|
| Robert Browning    | : | Andrea del Sarto                        |
| Christina Rossetti | : | When I am dead, my dearest              |
| DG Rossetti        | : | The Blessed Damozel                     |
| Thomas Hardy       | : | The Darkling Thrush                     |
| Robert Bridges     | : | So Sweet Love Seemed That<br>April Morn |

## Module 3

### Prose and Fiction

|                    |   |                                                                                     |
|--------------------|---|-------------------------------------------------------------------------------------|
| Charles Darwin     | : | <i>The Origin of Species</i><br>(From Chapter 15. Recapitulation<br>and Conclusion) |
| Arthur Conan Doyle | : | The Speckled Band                                                                   |
| Geroge Eliot       | : | <i>The Mill on the Floss</i>                                                        |
| Charlotte Bronte   | : | <i>Jane Eyre</i>                                                                    |
| Charles Dickens    | : | <i>A Tale of Two Cities</i>                                                         |
| Thomas Hardy       | : | <i>The Mayor of Casterbridge</i>                                                    |

## Module 4

### Drama (Detailed)

|             |   |                                        |
|-------------|---|----------------------------------------|
| Oscar Wilde | : | <i>The Importance of Being Earnest</i> |
|-------------|---|----------------------------------------|

### Suggested Reading

*Norton Anthology of English Literature Vol. E*

Robin Gilmour *The Victorian Period: The Intellectual and Cultural Context of English Literature, 1830-1890*

Robin Gilmour *The Novel in the Victorian Age: A Modern Introduction*

Joanne Shattock. *The Cambridge Companion to English Literature, 1830–1914*

William E. Buckler *The Victorian Imagination: Essays in Aesthetic Exploration*

Deirdre David. *The Cambridge Companion to the Victorian Novel*

Jerome H Buckley *The Victorian Temper: A Study in Literary Culture*

Francis O’Gorman *The Cambridge Companion to Victorian Culture*

Joseph Bristow *The Cambridge Companion to Victorian Poetry*

### Web Resources

[www.victorianweb.org](http://www.victorianweb.org)

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 2 | (10 marks) |
| (c) One essay of 350 words out of two from Module 3 | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 | (10 marks) |

- II** Four out of six annotation questions (80 words) from the poems and drama prescribed for detailed study in Module 2 and Module 4 respectively. (4 X 5 = 20 marks)
- III** Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4. (4 X 5 = 20 marks)

## ENG 2C07 MODERN LITERARY THEORY

### Module 1

|                |   |                                  |
|----------------|---|----------------------------------|
| T.S. Eliot     | : | Tradition and Individual Talent  |
| Cleanth Brooks | : | The Language of Paradox          |
| Northrop Frye  | : | Archetypal Criticism             |
| Sigmund Freud  | : | Creative Writers and Daydreaming |

### Module 2

|                 |   |                                                                                                                     |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------|
| Louis Althusser | : | Ideology and Ideological State Apparatus (Norton Anthology)                                                         |
| Susan Gubar     | : | From The Madwoman in the Attic: The Woman Writer and the Nineteenth century Literary Imagination (Norton Anthology) |

### Module 3

|                 |   |                                                                                          |
|-----------------|---|------------------------------------------------------------------------------------------|
| Jacques Derrida | : | Structure, sign and Play in the Discourse of Human Sciences                              |
| Michel Foucault | : | From Discipline and Punish: The Birth of Prison (Norton Anthology of Theory & Criticism) |

### Module 4

|                        |   |                                               |
|------------------------|---|-----------------------------------------------|
| Stephen Greenblatt     | : | Resonance and Wonder                          |
| Ernst Renan            | : | What is a Nation?                             |
| Jean- Francois Lyotard | : | Defining the Postmodern (In Norton Anthology) |

### Suggested Reading:

Terry Eagleton *Literary Theory: An Introduction*  
 Terry Eagleton *Ideology: An Introduction*  
 Patricia Waugh *Literary theory and Criticism*  
 David Lodge (ed.). *Twentieth Century Literary Criticism reader*  
 David Lodge (ed.). *Modern Criticism and Theory*  
 Raman Selden et al *A Reader's Guide to Contemporary Literary Theory*  
 V. S.Sethuraman(ed.) *Contemporary 'Criticism; An Anthology*  
 Jerome Neu *The Cambridge Companion to Freud*  
 Gill Plain & Susan Sellers (eds.) *A History of Feminist Literary Criticism*  
 Ellen Rooney *The Cambridge Companion to Feminist Literary Theory*  
 William J. Handy & Max Westbrook (eds.) *Twentieth Century Criticism*  
 Fred Rush *The Cambridge Companion to Critical Theory*  
 M.A.R. Habib *Modern Literary Criticism and Theory: A History*  
 Peter Collier & Helga Geyer-Ryan *Literary Theory Today*  
 Gary Gutting *The Cambridge Companion to Foucault*  
 Madan Sarup *An Introductory Guide to Post Structuralism and Post Modernism*

Dennin Walder *Literature in the Modern World*

Michael Groden & Martin Kreiswith (eds.) *The Johns Hopkins Guide to Literary Theory and Criticism*

Michael Kelly (Ed.) *Encyclopedia of Aesthetics Vols. 1, 2,3 and 4*

### **Question paper pattern**

**Duration: 3 Hrs**

**Maximum Marks: 80**

#### **I Essay (40 marks)**

- (a) One essay of 350 words out of two from Module 1 (10 marks)
- (b) One essay of 350 words out of two from Module 2 (10 marks)
- (c) One essay of 350 words out of two from Module 3 (10 marks)
- (d) One essay of 350 words out of two from Module 4 (10 marks)

#### **II Eight out of ten paragraph questions (100 words) from all modules**

(8 X 5 = 40 marks)

## **ENG 2E04 TRANSLATION STUDIES**

### **Module 1**

The growth and development of the discipline

Relevance of Translation Studies

Approaches to translation through the ages

The politics of translation

### **Module 2**

Types of translation—The processes involved in translation—Transference, transliteration and transcreation—Problems involved in translation—Language varieties in translation—

Machine translation

### **Module 3**

Susan Bassnett

: Culture and Translation

Roman Jakobson

: On Linguistic Aspects of Translation

Sujit Mukherjee

: A Link Literature for India

Annie Brisset

: The Search for a Native Language:  
Translation and Cultural Identity

Ayyappa Panikkar

: “Contemporary Textual Politics: Translating a  
Sacred Text”

### **Module 4**

Practical exercise in Translating prose passages from SL to English language. (Internal Assessment should be based on this. Two Thousand words in TL)

### **Suggested Reading**

Piotr Kuhiwczak and Karinn Littau *A Companion to Translation Studies*

Lawrence Venuti (ed.) *The Translation Studies Reader*, (pp. 342-357)

Sujit Mukherjee *Translation as Discovery*

Susan Bassnett, *Translation Studies*

JC Catford *A Linguistic Theory of Translation*

BK Das *The Horizon of Translation Studies*

Routledge *Encyclopaedia of Translation Studies*.



**Question paper pattern**

**Duration: 3 Hrs**

**Maximum Marks: 80**

**I** Essay (40 marks)

- (a) One essay of 350 words out of two from Module 1 (10 marks)  
(b) One essay of 350 words out of two from Module 2 (10 marks)  
(c) Two essays of 350 words out of four from Module 3 (2 X 10 marks= 20 Marks)

**II** Eight out of ten paragraph questions (100 words) from all modules

(8 X 5 = 40 marks)

**ENG2E05  
WORLD DRAMA**

**Module 1**

**Background**

History of Theatre (Classical Greek, Roman and Sanskrit)  
Drama in Western and Eastern Cultures  
The Elizabethan Theatre  
Modern Theatre  
Dramatic Form and Styles

**Module 2**

Sophocles *Oedipus the King*  
Kalidasa *Abhijnana Sakuntalam*  
William Shakespeare *King Lear (Detailed)*

**Module 3**

Anton Chekhov *Uncle Vanya*  
Henrik Ibsen *A Doll's House*  
J.M. Synge *The Playboy of the Western World*  
Bertolt Brecht *The Three Penny Opera (Detailed)*

**Module 4**

Eugene Ionesco *The Killer*  
Harold Pinter *The Birthday Party*  
Vijay Tendulkar *Silence! The Court is in Session*  
Ama Ata Aidoo *The Dilemma of a Ghost (Detailed)*

**Suggested Reading**

Martin Banham *The Cambridge Guide to World Theatre*  
Phyllis Hartnoll *The Oxford Companion to Theatre*  
Eric Bentley *The Classic Theatre*  
Oscar G. Brockett *The Theatre: An Introduction*  
Ton Hoenselaars *The Cambridge Companion to Shakespeare and Contemporary Dramatists*  
David Wiles *The Cambridge Companion to Theatre History*

## Question paper pattern

Duration: 3 Hrs

Maximum Marks: 80

### I Essay (40 marks)

- (a) One essay of 350 words out of two from Module 1 (10 marks)  
(b) One essay of 350 words out of two from Module 2 (10 marks)  
(c) One essay of 350 words out of two from Module 3 (10 marks)  
(d) One essay of 350 words out of two from Module 4 (10 marks)

II Three out of six annotation questions (80 words) from the plays prescribed for detailed study in Module 2, 3 & 4. (3 X 5 = 15 marks)

III Five out of seven paragraph questions (100 words) from all modules (5 X 5 = 25 marks)

## ENG 2E06 DALIT WRITINGS

### Module 1

#### Background

Origins of Dalit literature:

Buddha (6th c.) Chokhamela (14 AD) Mahatma Phule (1828-1890)

Prof. S. M. Mate (1886-1957) Dr. Bheemrao Ramji Ambedkar (1891-1956)

Emergence of Dalit Literary Movement

Dalit aesthetics

Dalits and the Indian narrative-identity politics-social history-political assertion

Dalit poetry

Malayalam Dalit writing.

### Module 2

#### Poetry

##### (Detailed)

Siddhalingaiah

Manohar Biswas

Pralhad Chendwankar

Hira Bansode

Namdeo Dhasal

Devadevan

##### (Non-Detailed)

Rajkumar N.D

Damodar More

Challappalli Swarupa Rani

Pravin Gadhavi

Bapurao Jagtap

Jyoti Lanjewar

The Dalits are Coming

A Hut in a Segregated Compound

Empty Advice

Slave

Man You should Explode

Infection

A Wish

Poetry Reading

Forbidden History

Brainwash

This Country is Broken

Caves

### Module 3

#### Fiction/Autobiography

|                          |                                                                                                                 |
|--------------------------|-----------------------------------------------------------------------------------------------------------------|
| Bama                     | <i>Karukku-</i>                                                                                                 |
| Narayanan                | <i>Kocharethi-</i>                                                                                              |
| Om Prakash Valmiki       | <i>Joothan-</i>                                                                                                 |
| Baburao Ramchandra Bagul | “Mother” (From <i>Indian short stories, 1900–2000</i> , by E.V. Ramakrishnan, Sahitya Akademi, 2005. Page 217.) |
| Harish Mangalam          | “The Midwife”                                                                                                   |
| C.Ayyappan               | “Madness”-                                                                                                      |

### Module 4

#### Prose

|               |                                                                                                          |
|---------------|----------------------------------------------------------------------------------------------------------|
| Kancha Ilaiah | Contemporary Hinduism (From <i>Why I am Not a Hindu</i> - Chapter IV)                                    |
| S.K. Limbale  | Dalit Literature and Aesthetics (From <i>Towards an Aesthetic of Dalit Literature</i> Chapter VII).      |
| B.R. Ambedkar | <i>Annihilation of Caste</i> Sections I-VI.<br>“Dalit Literature: Past, Present and Future” Arjun Dangle |

#### Suggested Reading

- Kancha Ilaiah *Why I am not a Hindu*  
James Massey *Roots: A Concise History of Dalits.*  
D R Nagaraj *The Flaming Feet and Other Essays: The Dalit Movement in India*  
Gail Omvedt *Dalit Visions: The Anti-Caste Movement and the Construction of an Indian Identity*  
Arjun Dangle (Ed.) *Poisoned Bread.*  
B.R. Ambedkar *Annihilation of Caste*  
B.R. Ambedkar *Buddha, or Karl Marx.*  
Sharmila Rege *Writing Caste/Writing Gender: Reading Dalit Women's Testimonies.*  
Gail Omvedt *Buddhism in India: Challenging Brahmanism and Caste*  
Susie J. Tharu *No Alphabet in Sight: New Dalit Writing from South India*

#### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

#### I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 2 | (10 marks) |
| (c) One essay of 350 words out of two from Module 3 | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 | (10 marks) |

**II** Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2. (4 X 5 = 20 marks)

**III** Four out of six paragraph questions (100 words) from Modules 2 (non-detailed poems), 3 & 4. (4 X 5 = 20 marks)

**SEMESTER 3—Four Core Courses and one Elective (select one among three)**

| Semester   | Course Code                      | Title                                                                                                                                      | Internal   | External   | Total      | Credit    | Hours     |
|------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|-----------|-----------|
| <b>III</b> | ENG 3C 08                        | Twentieth Century British Literature                                                                                                       | 20         | 80         | 100        | 4         | 6         |
|            | ENG 3C09                         | Linguistics                                                                                                                                | 20         | 80         | 100        | 4         | 4         |
|            | ENG 3C10                         | Indian Writing in English                                                                                                                  | 20         | 80         | 100        | 4         | 5         |
|            | ENG 3C11                         | American Literature                                                                                                                        | 20         | 80         | 100        | 4         | 6         |
|            | ENG 3E07<br>ENG 3E08<br>ENG 3E09 | <b>Elective</b> (Choose one among three)<br>Introduction to Cultural Studies<br>European Fiction<br>Introduction to Comparative Literature | 20         | 80         | 100        | 4         | 4         |
|            | <b>TOTAL</b>                     |                                                                                                                                            | <b>100</b> | <b>400</b> | <b>500</b> | <b>20</b> | <b>25</b> |

**ENG 3C08  
TWENTIETH CENTURY BRITISH LITERATURE**

**Module 1**

**Background:**

The Modernist Revolution (Anglo-American Modernism and the Celtic Modernism)  
The Great War (I WW) and Literature  
The Irish Nationalism and Literature  
Modernist Poetry in English  
A Survey of post-1950s British Literature

**Module 2**

**Poetry:**

**Detailed**

|              |                                                                                 |
|--------------|---------------------------------------------------------------------------------|
| W.B. Yeats   | The Second Coming, Easter 1916                                                  |
| TS Eliot     | The Waste Land (Annotation questions only from section1:<br>Burial of the Dead) |
| Wilfred Owen | Strange Meeting                                                                 |
| Tom Gunn     | On the Move                                                                     |
| Ted Hughes   | Pike                                                                            |

**Non-Detailed**

|               |                                       |
|---------------|---------------------------------------|
| W.H.Auden     | The Shield of Achilles                |
| D.H. Lawrence | Snake                                 |
| Dylan Thomas  | Do not go Gentle into that Good Night |
| Philip Larkin | Ambulance                             |
| R.S. Thomas   | Death of a Peasant                    |
| Seamus Heaney | The Tollund Man                       |

**Module 3**

**Drama:**

**Detailed**

|                |                   |
|----------------|-------------------|
| Samuel Beckett | Waiting for Godot |
|----------------|-------------------|

## Non-Detailed

Harold Pinter                      The Dumb Waiter  
Bernard Shaw                      Arms and the Man

## Module 4

### Fiction

James Joyce                      A Portrait of the Artist as a Young Man  
Virginia Woolf                      Mrs. Dalloway  
E.M. Foster                      A Passage to India  
John Fowles                      The French Lieutenant's Woman

### Suggested reading:

*The Norton Anthology of English Literature: 20<sup>th</sup> Century*  
Peter Nicholls *Modernisms: A Literary Guide*  
Alex Davis *The Cambridge Companion to Modernist Poetry*  
Peter Childs *Modernism*  
Santanu Das *The Cambridge Companion to the Poetry of the First World War*  
Martin Esslin *The Theatre of the Absurd*  
Robert L. Caserio *The Cambridge Companion to the Twentieth-Century English Novel*  
Christopher Gillie *Movements in English Literature, 1900-1940*  
Neil Corcoran *The Cambridge Companion to Twentieth-Century English Poetry*  
David Lodge *The Modes of Modern Writing: Metaphor, Metonymy, and the Typology of Modern Literature*  
Dennis Walder (ed.) *Literature in the Modern World: Critical Essays and Documents*  
Marjorie Howes *The Cambridge Companion to W. B. Yeats*

## Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

### I Essay (40 marks)

- (a) One essay of 350 words out of two from Module 1                      (10 marks)  
(b) One essay of 350 words out of two from Module 2                      (10 marks)  
(c) One essay of 350 words out of two from Module 3                      (10 marks)  
(d) One essay of 350 words out of two from Module 4                      (10 marks)

**II** Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2 and the detailed drama in Module 4.

(4 X 5 = 20 marks)

**III** Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4.                      (4 X 5 = 20 marks)

## ENG 3C09 LINGUISTICS

### Module 1

#### Background

What is linguistics?

The Branches of linguistics: General, Descriptive, Historical, Theoretical and Applied  
Introduction to Developmental linguistics, Sociolinguistics, Psycholinguistics and Neuro-

linguistics

Important Schools and Theorists: Prague, Copenhagen, London

American Structuralism—Saussure, Firth, Halliday, Sapir, Bloomfield and Chomsky

## **Module 2**

### **Phonology**

Basic concepts: Phone, Phoneme, Allophone

Speech Mechanisms; Classification of speech sounds: Vowels and Consonants

Supra segmental features: Stress, Pitch, Intonation

## **Module 3**

### **Morphology**

Morphological Processes Word classes: Form class and Function class

Morpho-phonemics: Addition, Elision, Assimilation

Fundamental word formation processes: Root-creation, Derivation, Compounding,

Borrowing

## **Module 4**

### **Syntax**

Formal and functional labels

The structures of Phrases and Clauses

Structural grammar: IC Analysis, PS Grammar Transformational Generative Grammar (TG)

Competence and Performance. Deep Structure and Surface Structure, Ambiguity,

Limitations.

## **Module 5**

### **Semantics**

The Concept of Meaning: Lexical and Grammatical; Denotative and Connotative; Situational and Contextual; Theme and Rhyme

Theories of Meaning: Hyponymy, Metonymy, Synonymy, Antonym, Entailment, Prototype

Discourse: Proposition, Presupposition, Entailment, Implication

### **Suggested reading:**

John Lyons *Linguistics*

John Lyons *Language and Linguistics: An Introduction*

Georg Yuli *The Study of Language*

H A Gleason, Jr *Linguistics and English Grammar*

*An Introduction to Descriptive Linguistics*

*Workbook in Descriptive Linguistics*

Michael Ashby *Introducing Phonetic Science*

Roman Jakobson & Morris Halle *Fundamentals of Language*

David Odgen *Introducing Phonology*

M. A. K. Halliday, Angus McIntosh & *The Linguistic Sciences and Language Teaching*

Peter Stevens

Edward Sapir *Language: An Introduction to the Study of Speech*

Ron Cowan *The Teacher's Grammar of English*

Eugene A. Nida *A Synopsis of English Syntax*

Harold B. Allen *Readings in Applied English Linguistics*

George Oliver Curme *Syntax*

Noam Chomsky *Syntactic Structures*

James R. Hurford *Semantics: A Course Book 2/E*

## Question paper pattern

Duration: 3 Hrs

Maximum Marks: 80

### I Essay (40 marks)

- (a) One essay of 350 words out of two from Module 1 (10 marks)  
(b) One essay of 350 words out of two from Module 2 (10 marks)  
(c) One essay of 350 words out of two from Module 3 (10 marks)  
(d) One essay of 350 words out of two from Module 4 or Module 5 (10 marks)

### II Eight out of ten paragraph questions (100 words) from all modules

(8 X 5 = 40 marks)

## ENG 3C10 INDIAN WRITING IN ENGLISH

### Module I

#### Background

Growth of English in India  
Poetry since Independence  
Writing by the Indian Diaspora  
Novel in the 1980s and 1990s

### Module 2

#### Poetry

##### Detailed

|                 |                     |
|-----------------|---------------------|
| Aurobindo       | The Stone Goddess   |
| Toru Dutt       | Our Casuarina Tree  |
| Nissim Ezekiel  | Background Casually |
| Tagore          | They Call You Mad   |
| Eunice de Souza | Songs of Innocence  |

##### Non-Detailed

|                |                       |
|----------------|-----------------------|
| Dom Moraes     | Wrong Address, Asleep |
| A.K.Ramanujan  | Anxiety, The Guru     |
| Vikram Seth    | Flash                 |
| Imtiaz Dharkar | Gaddi aa Gayi         |

### Module 3

#### Prose and Fiction

|                   |                                                                                                                                                        |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Partha Chatterjee | “Whose Imagined Community?” (From<br><i>The Nation and its Fragments: Colonial and<br/>Postcolonial Histories</i> . Princeton: Princeton UP,<br>1993.) |
| Aravind Adiga     | <i>White Tiger</i>                                                                                                                                     |
| Rohinton Mistry   | <i>Such a Long Journey</i>                                                                                                                             |
| Amitav Ghosh      | <i>The Shadow Lines</i>                                                                                                                                |

## Module 4

### Drama

#### Detailed

Mahesh Dattani

*The Girl Who Touched the Stars*

#### (Non-Detailed)

Girish Karnad

*Tale Danda*

### Suggested Reading

S.Z.H. Abidi *Studies in Indo-Anglian Poetry*

Shyam Asnani M *Critical Response to Indian English Fiction*

A.K. Mehrotra *A Concise History of Indian Literature in English*

Krishna S. Bhatta *Indian English Drama: A Critical Study*

O.P Bhatnagar, (Ed.) *Studies in Indian Poetry in English*

S.R. Desai and G.N. Devy *Critical Thought: An Anthology of 20<sup>th</sup> Century Indian English Essays*

Eunice De Souza and Silgado Melanie (Ed.) *These My Words: The Penguin Book of Indian Poetry.*

Bruce King, *Modern Indian Poetry in English*

P Lal (Ed.) *Modern Indian Poetry in English: An Anthology and A Credo.*

E.N. Lall, *The Poetry of Encounter: Dom Moraes, A.K. Ramanujan and Nissim Ezekiel*

Ashley Myles E. (Ed.) *An Anthology of Indo-Anglian Poetry*

M.K. Naik (Ed.) *Perspectives on Indian Poetry in English*

Saleem Peeradina (Ed.) *Contemporary Indian Poetry in English: An Assessment and Selection*

Madhusudan Prasad (Ed.) *Indian English Novelists: An Anthology of Critical Essays*

P.P. Raveendran *Texts, Histories, Geographies: Reading Indian Literature*

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

#### I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 2 | (10 marks) |
| (c) One essay of 350 words out of two from Module 3 | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 | (10 marks) |

**II** Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2 and the detailed drama in Module 4.

(4 X 5 = 20 marks)

**III** Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4.

(4 X 5 = 20 marks)



# ENG 3C11

## AMERICAN LITERATURE

### Module 1

#### Background

Early Puritan Settlement to 1900: The Multiple Contexts of American Literature.  
Harlem Renaissance  
Realistic Tragedy and 20<sup>th</sup> Century American Drama  
American Literature since 1945

### Module 2

#### Poetry

##### Detailed

|                |                                          |
|----------------|------------------------------------------|
| Emerson        | Brahma                                   |
| Robert Frost   | Christmas Trees                          |
| TS Eliot       | “Little Gidding,” from the Four Quartets |
| Sylvia Plath   | Daddy                                    |
| Allen Ginsberg | Howl (I section only)                    |

##### Non-Detailed:

|                 |                                     |
|-----------------|-------------------------------------|
| Walt Whitman    | Passage to India                    |
| Emily Dickinson | I Measure Every Grief I Meet        |
| EE Cummings     | What if a much of a which of a wind |
| Ezra Pound      | And the days are not full enough    |
| John Ashberry   | The one thing that can save America |
| Adrienne Rich   | Cartographies of Silence            |

### Module 3

#### Drama

##### Detailed

|               |                                      |
|---------------|--------------------------------------|
| Eugene O’Neil | <i>Long Day’s Journey into Night</i> |
|---------------|--------------------------------------|

##### Non-detailed:

|                    |                                 |
|--------------------|---------------------------------|
| Tennessee Williams | <i>A Streetcar Named Desire</i> |
| Lorraine Hansberry | <i>A Raisin in the Sun</i>      |

### Module 4

#### Prose

|                     |                                    |
|---------------------|------------------------------------|
| Henry David Thoreau | On the Duty of Civil Disobedience  |
| Ralph Waldo Emerson | The Over-Soul                      |
| Ernest Hemingway    | Death in the Afternoon (Chapter 1) |

#### Fiction

|                 |                         |
|-----------------|-------------------------|
| Mark Twain      | <i>Huckleberry Finn</i> |
| Herman Melville | <i>Moby Dick</i>        |
| Tony Morrison   | <i>The Bluest Eye</i>   |
| Don Delillo     | <i>White Noise</i>      |

#### Suggested Reading:

|                                                |                                                                |
|------------------------------------------------|----------------------------------------------------------------|
| <i>Norton Anthology of American Literature</i> |                                                                |
| Walter Kalaidjian                              | <i>The Cambridge Companion to American Modernism</i>           |
| Joshua L. Miller                               | <i>The Cambridge Companion to the American Modernist Novel</i> |

|                    |                                                               |
|--------------------|---------------------------------------------------------------|
| Alan Shucard et al | <i>Modern American Poetry 1865-1950</i>                       |
| Timothy Parrish    | <i>The Cambridge Companion to American Novelists</i>          |
| Mark Richardson    | <i>The Cambridge Companion to American Poets</i>              |
| Ed. A. Robert Lee  | <i>Nineteenth-Century American Poetry</i>                     |
| Jennifer Ashton    | <i>The Cambridge Companion to American Poetry since 1945</i>  |
| John N. Duvall     | <i>The Cambridge Companion to American Fiction after 1945</i> |

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

I Essay (40 marks)

- |                                                                    |            |
|--------------------------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1                | (10 marks) |
| (b) One essay of 350 words out of two from Module 2                | (10 marks) |
| (c) One essay of 350 words out of two from Module 3                | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 (Fiction only) | (10 marks) |

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2 and the detailed drama in Module 3. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4 (Prose selections only). (4 X 5 = 20 marks)

## ENG 3E07

### INTRODUCTION TO CULTURAL STUDIES

#### Module 1

##### Background

Difference between Culture and Civilization  
 The concept of Culture/Theorising Culture  
 What is Cultural Studies?  
 Globalisation: Power, Inequality and Culture  
 Popular Culture  
 Key Methodologies in Cultural Studies

#### Module 2

Chris Barker

An Introduction to Cultural Studies. In *Cultural Studies: Theory and Practice* (pp. 3-31)

Stuart Hall

Cultural Studies: Two Paradigms  
 Cultural Studies and its Theoretical Legacies  
 Advertising: The Magic System

Raymond Williams

#### Module 3

Theodore Adorno and Max Horkheimer

The Culture Industry: Enlightenment as Mass Deception.

Michel Foucault

Space, Power, Knowledge

Richard Dyer

Entertainment as Utopia

#### Module 4

Ashis Nandy

“Tradition, Transgression and Norms” (pp. 1-8)  
 From *The Tao of Cricket*

Sarah Berry "Fashion."(pp. 454-470) *A Companion to Cultural Studies* (Ed.) Toby Miller

James Staples Civilizing Taste: From Caste to Class in South Indian Foodways. *Food Consumption in Global Perspectives* (Eds.) Jakob Klein and Anne Muscott

George Kurman "What Does Girls' Cheerleading Communicate?" from *Journal of Popular Culture*, Fall 1986

### Suggested Reading

Chris Barker *Cultural Studies: Theory and Practice*

Theodore Adorno *The Culture Industry*

Raymond Williams *Culture and Society, 1780-1950*

Mikael Bakhtin *The Dialogic Imagination*  
*Rabelais and His World*

Jean Baudrillard *Simulacra and Simulations. In Jean Baudrillard: Selected Writings*

Roland Barthes *The Fashion System*

Michael Higgins *The Cambridge Companion to Modern British Culture*

Christopher Bigsby *The Cambridge Companion to Modern American Culture*

T. Bennet et al *New Keywords: A Revised Vocabulary of Culture and Society*

Homi K. Bhabha *The Location of Culture*

Judith Butler *Gender Trouble: Feminism and the Subversion of Identity*

Lawrence Grossberg *Bringing It All Back Home: Essays on Cultural Studies*

David Morley *Television, Audiences and Cultural Studies*

### Journals

[\*International Journal of Cultural Studies\*](#)

*Cultural Studies*

*Journal of Popular Culture*

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

#### I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 2 | (10 marks) |
| (c) One essay of 350 words out of two from Module 3 | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 | (10 marks) |

#### II Eight out of ten paragraph questions (100 words) from all modules

(8 X 5 = 40 marks)

# ENG 3E08

## EUROPEAN FICTION

### Module 1

#### Background

Political Affiliation amongst nineteenth and twentieth century European novelists  
The response to Industrialisation, War and Class Relations amongst European novelists  
Overview of Twentieth Century Intellectual and Artistic Movements

### Module 2

|                     |                             |
|---------------------|-----------------------------|
| Miguel De Cervantes | <i>Don Quixote</i>          |
| Flaubert            | <i>Madam Bovary</i>         |
| Fyodor Dostoevsky   | <i>Crime and Punishment</i> |

### Module 3

|               |                                           |
|---------------|-------------------------------------------|
| Italo Calvino | <i>If on a Winter's Night a Traveller</i> |
| Franz Kafka   | <i>The Trial</i>                          |
| Marcel Proust | <i>Remembrance of Things Past</i>         |

### Module 4

|               |                                          |
|---------------|------------------------------------------|
| Milan Kundera | <i>The Unbearable Lightness of Being</i> |
| Albert Camus  | <i>The Outsider</i>                      |
| Gunter Grass  | <i>The Tin Drum</i>                      |

### Suggested Reading

Norman F. Cantor *Twentieth-Century Culture Modernism to Deconstruction*  
Malcolm Bradbury and James McFarlane (Eds.) *Modernism: A Guide to European Literature 1890-1930*  
H. Reiss *The Writer's Task from Nietzsche to Brecht*  
E. M. Forster *Aspects of the Novel*  
A. F. Boyd *Aspects of the Russian Novel*  
Michael Bell *The Cambridge Companion to European Novelists*  
A. Burgess *The Novel Now: A Guide to Contemporary Fiction*  
E. Starkie *Flaubert: The Making of the Master*  
E. Starkie *Flaubert: The Master*  
Thorlby *Kafka: A Study*  
M. Turnell *The Novel in France*  
G. Lukacs *Studies in European Realism*

### Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

#### I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 2 | (10 marks) |
| (c) One essay of 350 words out of two from Module 3 | (10 marks) |
| (d) One essay of 350 words out of two from Module 4 | (10 marks) |

#### II Eight out of ten paragraph questions (100 words) from all modules

(8 X 5 = 40 marks)

## 3E09

# INTRODUCTION TO COMPARATIVE LITERATURE

### Module 1

#### Background

Definition and Scope of Comparative Literature

Development of the Discipline

Methodology

Comparative Indian Literature

### Module 2

#### Theory

1. French School:

(a) Literary Schools and Genres

(b) Ideological Echoes (including Theological, Philosophical, Ethical, Political, Scientific and Aesthetic Ideas)

(c) Image Echoes

(d) Verbal Echoes

(e) Human Models and Heroes

2. American School

(a) The Parallelism Theory

(b) The Intertextuality Theory (Literature and other fields of Cognition)

### Module 3

The Concept of Influence

(Literary and Non-Literary; Direct and Indirect; Positive and Passive)

The Concept of Reception

The Concept of Imitation and Borrowing

### Module 4

#### Essays

Hutcheson Macaulay Posnett *The Science of Comparative Literature\**

Mary Louise Pratt *Comparative Literature and Global Study: A Redefinition of the Discipline.\**

René Wellek *The Crisis of Comparative Literature (in Concepts of Criticism)*

Matt Waggoner *A Review of Gayatri Chakravorty Spivak, *Death of a Discipline**

#### Suggested Reading

Susan Bassnett *Comparative Literature: A Critical Introduction*

Charles Bernheimer *Comparative Literature in the Age of Multiculturalism*

Amiya Dev *The Idea of Comparative Literature in India,*

Amiya Dev and Sisir Kumar Das (eds.) *Comparative Literature: Theory and Practice*

Claudio Guillen *The Challenge of Comparative Literature.*

Prawar SS *Comparative Literature Studies*

Stalknett NP et al. *Comparative Literature*

Spivak, Gayatri Chakravorty *Death of a Discipline*

Wellek, Rene and Austin Warren *Theory of Literature*

Ulrich Weisstein *Comparative Literature and Literary Theory.*

\*Charles Bernheimer (ed.), *Comparative Literature in the Age of Multiculturalism*, Baltimore, the Johns Hopkins Univ. Press, 1995, PP. 58 - 65

\**The Contemporary Review* (79), 1901, pp. 855-72.

**Question paper pattern****Duration: 3 Hrs****Maximum Marks: 80****I Essay (40 marks)**

- (a) One essay of 350 words out of two from Module 1 (10 marks)  
 (b) One essay of 350 words out of two from Module 2 (10 marks)  
 (c) One essay of 350 words out of two from Module 3 (10 marks)  
 (d) One essay of 350 words out of two from Module 4 (10 marks)

**II Eight out of ten paragraph questions (100 words) from all modules****(8 X 5 = 40 marks)****SEMESTER 4—Six Core Courses including Project Work and Viva-voce**

| Semester | Course Code  | Title                 | Internal   | External   | Total      | Credit    | Hours     |
|----------|--------------|-----------------------|------------|------------|------------|-----------|-----------|
| IV       | ENG 4C 12    | Postcolonial Writings | 20         | 80         | 100        | 4         | 6         |
|          | ENG 4C 13    | Women's Writing       | 20         | 80         | 100        | 4         | 6         |
|          | ENG 4C 14    | Film Studies          | 20         | 80         | 100        | 4         | 6         |
|          | ENG 4C 15    | Comprehension         | 20         | 80         | 100        | 4         | 4         |
|          | ENG PR 16    | Project               | 20         | 80         | 100        | 4         | 3         |
|          | ENG 4C 17    | Viva-Voce             | 00         | 100        | 100        | 4         | 0         |
|          | <b>TOTAL</b> |                       | <b>100</b> | <b>500</b> | <b>600</b> | <b>24</b> | <b>25</b> |

**ENG 4C12****POSTCOLONIAL WRITINGS****Module I****General Topics**

Major Themes and Concerns in Postcolonial Writing: Diaspora, Assimilation, Appropriation, Hybridity, Alterity.

"Orientalism" or Exoticizing, Subaltern, Race relations.

The Problems and Consequences of Decolonization, Aboriginal Writing.

**Module 2****Poetry****Detailed**

|                   |                    |
|-------------------|--------------------|
| Al Purdy          | Married Man's Song |
| Oodgeroo Noonucal | All One Race       |
| Derek Walcott     | The Sea is History |
| David Diop        | Africa             |
| Leopold Senghor   | Black Woman        |

**Non-detailed**

|                   |                         |
|-------------------|-------------------------|
| John Shaw Neilson | Surely God was a Lover. |
|-------------------|-------------------------|

Gabriel Okara Piano and Drums, Were I to Choose.  
 Yasmine Goonaratne On An Asian Poet Fallen among American Translators  
 Faiz Ahmad Faiz Nowhere, No Trace Can I Discover.

### Module 3

#### Prose /Literary Criticism

Edward Said Introduction to *Orientalism*. Sections I and II  
 Henry Louis Gates Jr. “Writing ‘Race’ and the Difference it Makes.” (From *Feminist Literary Theory: A Reader* .Ed. Mary Eagleton.)  
 Homi Bhabha “Of Mimicry and Man: The Ambivalence of Colonial Discourse.”(From *The Location of Culture*.London: Routledge, 2006).  
 Oyeronki Oyewumi “ Colonising Bodies and Minds: Gender and Colonialism” (Only the sections “Gender and Colonialism” and “The State of Patriarchy”)  
 Ngũgĩ Wa Thiong'o “The Language of African Literature” Sections III, IV and V.  
 Frantz Fanon “Reciprocal Bases of National Culture and the Fight for Freedom” (From the Essay “On National Culture” by Fanon)

### Module 4

#### Fiction

V. S.Naipaul *A House for Mr. Biswas*  
 Chimamanda Adichi *Half of a Yellow Sun*  
 Jean Rhys *Wide Sargasso Sea*  
 Salman Rushdie *Midnight’s Children*

### Module 5

#### Drama

##### Detailed

Wole Soyinka *Death and the King’s Horseman*

##### Non-Detailed

Marguerite Duras *India Song*  
 Aime Cesaire *A Tempest*

### Suggested Reading

Frantz Fanon *The Wretched of the Earth*.  
 \_\_\_\_\_ *Black Skin, White Masks*.  
 Edward Said *Orientalism*.  
 \_\_\_\_\_ *Culture and Imperialism*.  
 Gayatri Spivak *In Other Worlds: Essays in Cultural Politics*.  
 Ramachandra Guha. (Ed.) *Subaltern Studies*.  
 Neil Lazarus *The Cambridge Companion to Postcolonial Literary Studies*  
 Ashis Nandy *The Intimate Enemy*.  
 Partha Chatterjee *Nationalist Thought and the Colonial World*.  
 Aime Cesaire *Discourse on Colonialism*.  
 Ato Quayson *The Cambridge Companion to the Postcolonial Novel*  
 R.Young *White Mythologies: Writing, History and the West*.  
 F. Abiola Irele *The Cambridge Companion to the African Novel*  
 Kunapipi *Journal of Postcolonial Writing and Culture*

## Question paper pattern

**Duration: 3 Hrs**

**Maximum Marks: 80**

I Essay (40 marks)

- |                                                     |            |
|-----------------------------------------------------|------------|
| (a) One essay of 350 words out of two from Module 1 | (10 marks) |
| (b) One essay of 350 words out of two from Module 3 | (10 marks) |
| (c) One essay of 350 words out of two from Module 4 | (10 marks) |
| (d) One essay of 350 words out of two from Module 5 | (10 marks) |

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2 and the drama for detailed study in Module 5. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3, Module 4 and Module 5. (4 X 5 = 20 marks)

## ENG 4C13 WOMEN'S WRITING

### Module I

#### Background

Theoretical Approaches to Women's Writing  
Women's Tradition, Women's Canon  
Women's Literary Lineage, Race, Class and Sexuality  
Expansion of the Literary Canon—Styles and Strategies of Writing  
Women's Writing in India—Gender and Genre  
Post-Colonialism and Feminism

### Module 2

#### Fiction/Non Fiction

|                          |                                        |
|--------------------------|----------------------------------------|
| Margaret Atwood          | <i>The Handmaid's Tale.</i>            |
| Maya Angelou             | <i>I Know Why the Caged Bird Sings</i> |
| Lalithambika Antharjanam | <i>Agnisakshi</i>                      |

### Module 3

#### Poetry

##### Detailed

|               |                    |
|---------------|--------------------|
| Akkamaha Devi | You have Come      |
| Janabai       | Cast off all Shame |
| Kamala Das    | An Introduction    |
| Judith Wright | The Killer         |
| Anne Sexton   | After Auschwitz    |

##### Non-detailed

|                 |                               |
|-----------------|-------------------------------|
| Judith Wright   | The Company of Lovers         |
| Denise Levertov | Talking to Grief              |
| Anne Sexton     | Briar Rose (Sleeping Beauty.) |
| Sappho          | On What is Best, One Girl     |



## Module 4

### Theory

Elaine Showalter

*From A Literature of Their Own :British Novelists from Bronte to Lessing.*

Juliet Mitchell

*Femininity, Narrative and Psychoanalysis.*

Ann Barr Snitow

*Mass Market Romance”*

Bell hooks

*Postmodern Blackness: ‘Yearning, Race, Gender and Cultural Politics,*

Jonathan Culler

*Reading as a Woman.*

Judith Butler

*Gender Trouble: Feminism and the Subversion of Identity.”*

(All essays/sections are from *Feminist Literary Theory: A Reader*. Ed. Mary Eagleton)

## Module 5

### Drama

#### Detailed

Caryl Churchill

*Top Girls*

#### Non-Detailed

Maria Irene Fornes

*Fefu and Her Friends*

Elizabeth Robins

*Votes for Women!*

### Suggested Reading

Ed Sue Roe

*Women Reading Women’s Writing*

Catherine Belsey

*Critical Practice*

Nancy Armstrong

*Desire and Domestic Fiction: A Political History of the Novel*

Juliet Mitchell

*Women: The Longest Revolution*

Ellen Moers

*Literary Women*

Maren Tova Linett

*The Cambridge Companion to Modernist Women Writers*

Janet Todd

*Feminist Literary History: A Defence*

Ellen Rooney

*The Cambridge Companion to Feminist Literary Theory*

Toril Moi

*Textual/Sexual Politics: Feminist Literary Theory*

Ed. Toril Moi

*French Feminist Thought: A Reader*

Alice Walker

*In Search of Our Mothers’ Gardens*

*Signs: Journal of Women in Culture and Society.*

### Question paper pattern

#### Duration: 3 Hrs

**Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1

(10 marks)

(b) One essay of 350 words out of two from Module 2

(10 marks)

(c) One essay of 350 words out of two from Module 4

(10 marks)

(d) One essay of 350 words out of two from Module 5

(10 marks)

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 3 and the detailed drama in Module 5 (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Modules 2 (non-detailed poems), 3, 4 and 5. (4 X 5 = 20 marks)

# ENG 4C14 FILM STUDIES

## Module 1

### Background

Literature and Film

Film Criticism: Different Approaches

Italian Neo-Realism and the French New Wave

Asian Cinema (Japanese, Korean, Iranian and Indian)

Contemporary Malayalam Cinema

## Module 2

**Film Terms:** Auteur Theory, Camera Angle, Cinema Verite, Cutting (cross, final, jump), Editing (continuity, dissolve, fade, invisible), Time (experienced, running, diegetic, simultaneous, subjective), Filmic Time and Space, Focus (deep-focus, deep-field,) Shots (close-up, establishing, medium, long, master, pan, tracking, insert), Mise-en-scene, Montage, Scene, Script, Special Effects.

**Film Genres:** Animation, Biopic, Crime Thriller, Documentary, Fantasy, Horror, Gangster, Historical, Road Movies, Science Fiction, War, Sports, Western, Indian Cinema (Masala movies, Parallel, South Indian Films)

## Module 3

### Film Theory

Andre Bazin

The Evolution of the Language of Cinema

Laura Mulvey

Visual Pleasure and Narrative Cinema

Christian Metz

Some Points in the Semiotics of Cinema

Mary Ann Doane

Film and the Masquerade: Theorizing the Female Spectator

Michael Allen

The Impact of Digital Technologies on Film Aesthetics

## Module 4

### Films to be screened and analysed

(One Essay Question on one of these films)

- |                      |                              |
|----------------------|------------------------------|
| 1. Sergei Eisenstein | Battleship Potemkin          |
| 2. Alfred Hitchcock  | Psycho                       |
| 3. Yasujiro Ozu      | Floating Weeds               |
| 4. Stanley Kubrick   | 2001: A Space Odyssey        |
| 5. David Lean        | The Bridge on the River Kwai |
| 6. Satyajit Ray      | Pather Panchali              |

### Suggested Reading

Andrew Dix *Beginning Film Studies*

Susan Hayward *Key Concepts in Cinema Studies*

Jarek Kupsc *The History of Cinema\: For Beginners*

Tim Bywater and Thomas Sobchack (Eds.) *Introduction to Film Criticism*

Leo Braudy & Marshall Cohen (Eds.) *Film Theory and Criticism: Introductory Readings*

Dudley Andrew *Concepts in Film Theory*

Dudley Andrew *The Major Film Theories: An Introduction*

Robert Stam and Toby Miller (Eds.) *Film and Theory: An Anthology*

Jay Leyda (Ed. and Translated) *Sergei Eisenstein: Film Form (Essays in Film Theory)*  
Ed. Manju Jain *Narratives of Indian Cinema*  
Mainspring Publishers *Introducing Film Studies*

### **Question paper pattern**

**Duration: 3 Hrs**

**Maximum Marks: 80**

**I** Essay (40 marks)

- (a) One essay of 350 words out of two from Module 1 (10 marks)  
(b) One essay of 350 words out of two from Module 2 (10 marks)  
(From Film Genres only)  
(c) One essay of 350 words out of two from Module 3 (10 marks)  
(d) One essay of 350 words out of two from Module 4 (10 marks)

**II** Eight out of ten paragraph questions (100 words) from all modules

(8 X 5 = 40 marks)

## **ENG 4C15 COMPREHENSION**

The Comprehension course comprises only the texts prescribed for the core courses in the PG programme. The question paper will consist of 40 (forty) multiple choice objective type questions and 40 (forty) fill in the blanks questions requiring one word or phrase each as answers.

The questions will test the overall understanding of the topics and the texts prescribed. This course is intended to equip the students to face the UGC-NET and similar examinations. The course will carry 20 internal marks based only on oral test of similar questions.

## **ENG PR 16 PROJECT**

The students are expected to prepare, under the guidance of a supervising teacher, a dissertation based on an intensive study on any author or a topic of their choice. Dissertation exclusively on texts prescribed for study as part of the M.A. course is to be avoided.

### Guidelines:

|               |   |                                                                    |
|---------------|---|--------------------------------------------------------------------|
| No. of Copies | : | One typed and hard-bound copy to be submitted to the university    |
| Length        | : | 12000-14000 words (50-60 pages back to back)                       |
| Font          | : | Times New Roman/Calibri, 12 point. Headings 14 points.             |
| Line Spacing  | : | Double space between lines, No additional space between paragraphs |
| Alignment     | : | Left aligned; Headings centralized.                                |

|                           |   |                                                                                   |
|---------------------------|---|-----------------------------------------------------------------------------------|
| Margins                   | : | 1.6” on left, 1.1 on all other sides.                                             |
| Citation and Bibliography | : | As per MLA Style sheet (8 <sup>th</sup> edn.)                                     |
| Deadline for Submission   | : | Within 14 days after the date of the last external examination of fourth semester |
| Internal assessment       | : | By the supervising teacher (Max marks: 20)                                        |
| External valuation        | : | At the valuation camp (Max. Marks: 80).                                           |

In the Comprehensive Viva in Semester 4, questions are to be asked from the project too.

|                                                         |   |                                                                                                                                                                        |
|---------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Criteria for Evaluation<br>(both internal and external) | : | Clarity of thought and expression, Logicality of arguments, Relevance and novelty of the topic, grip over the theoretical/analytical tools, conformity to methodology. |
|---------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## **ENG 4C 17 VIVA VOCE**

The viva-voce will be based on all courses including the electives and the project. Questions testing extensive and intensive understanding of the topics and the texts prescribed will be asked. The viva voce board will consist of two external examiners appointed by the university. The viva of one candidate will have the duration of minimum 20 minutes. The course does not carry any internal marks.

\*\*\*\*\*

(Abstract)

***B.Sc Mathematics Programme*** - Revised syllabus and model question paper under Choice Based Credit Semester System - Implemented w.e.f 2017 admissions - Orders Issued.

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**ACADEMIC C SECTION**

**No. Acad/C2/ 4762 /2014**

**Dated, Civil Station P.O, 23-05-2017**

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Read: 1. U.O of Even No. dated 12.05.2014

2. Minutes of the meeting of the BOS in Mathematics (UG) held on 20.12.2016.

3. Email from the Chairman , BOS in Mathematics (UG) dated 22.05.2017

**ORDER**

1. As per paper read (1) above, the scheme syllabus and pattern of question papers for core, complementary and open courses in B.Sc. Mathematics programme were implemented in the university w.e.f 2014 admission.

2. The meeting of the BOS in Mathematics (UG) held on 20.12.2016 vide paper read (2) above has recommended to incorporate certain modifications in the core papers 1B01MAT, 2B02MAT, 3B03MAT, 4B04MAT, 5B09MAT of B.Sc. Mathematics programme to be implemented w.e.f 2017 admissions.

3. The Chairman, Board of Studies in Mathematics (UG) vide paper read (3) above has submitted the revised syllabus of the core papers 1B01MAT, 2B02MAT, 3B03MAT, 4B04MAT, 5B09MAT of B.Sc. Mathematics programme to be implemented w.e.f 2017 admissions.

4. The Vice Chancellor, after examining the matter in detail, and in exercise of the powers of the Academic Council as per section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, has accorded sanction to implement with effect from 2017 admission, the revised syllabus of B.Sc. Mathematics programme incorporating the changes as recommended by the Board of Studies in Mathematics(UG), subject to report to the Academic Council.

P.T.O

5. The modified pages of syllabus and model question papers are appended for reference.
6. U.O as per the paper read (1) above, stands modified to this extent.
7. Orders, are therefore issued accordingly.

Sd/-  
**JOINT REGISTRAR (ACADEMIC)  
FOR REGISTRAR**

To

1. The Principals of the Affiliated Colleges offering B.Sc Mathematics course.

Copy To:

1. The Chairman, BOS in Mathematics (UG)
2. PS to VC/PA to PVC/PA to Registrar/PA to CE
3. JR/AR I Academic
4. SF/DF/FC.

Forwarded/By Order



Section Officer



**For more details; log on [www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in)**

# Modified Syllabus for B.Sc. Mathematics (Core)

## 1B01 MAT: Differential Calculus

### Module-I (18 Hours)

Limit and continuity, The Sandwich theorem, Continuity. (Section 1.2 and 1.5 of Text 3)  
Inverse functions and their derivatives, Hyperbolic functions and their derivatives (Section 6.1 and 6.10 of Text 3). Successive differentiation, Standard results -  $n^{\text{th}}$  derivatives, Leibnitz's theorem. (Sections 4.1 to 4.3 of Text 2)

### Module II (18 Hours)

Polar co-ordinates, Cylindrical and spherical co-ordinates (Sections 9.6 and 10.7 of Text 3)  
Derivative of arc, curvature, radius of curvature (except the topic: radius of curvature for pedal curve), Centre of curvature, Evolute and Involute, (Sections 4.12 to 4.15 of Text 2).

### Module-III (18 Hours)

Rolle's theorem, Lagrange's mean value theorem, Taylor's theorem, Maclaurin series, Taylor series, Increasing and decreasing functions, Maxima and minima, Asymptote (Sections 4.3 to 4.7, 4.17, 4.18, 4.20 of Text 2). Graphing with  $y'$  and  $y''$  - concavity, point of inflection and graphing, L Hospital's rule - Indeterminate forms, (Section 3.4 and 6.6 of Text 3)

### Module-IV (18 Hours)

Functions of several variables, Limits and continuity, Partial derivatives, Chain rule (theorem 5 without proof) (Sections 12.1 to 12.3, 12.5 of Text 3). Homogeneous functions, Euler's theorem on homogeneous functions. (Sections 11.8 and 11.8.1 of Text 1)

- Texts:**
1. S. Narayan and P. K. Mittal, Differential Calculus, Revised Edition, S. Chand Publishing.
  2. B.S. Grewal, Higher Engineering Mathematics, 36<sup>th</sup> Edition
  3. G. B. Thomas and R. L. Finney, Calculus and Analytic Geometry, 9<sup>th</sup> Edition.

**References:**

1. M. D. Weir, J. Hass and F. G. Giordano, Thomas' Calculus, 11<sup>th</sup> Edition, Pearson.
2. H. Anton, I. Bivens and S. Davis, Calculus, 7<sup>th</sup> Edition, Wiley.
3. S. K. Stein, Calculus with Analytic Geometry, McGraw Hill.
4. G. F Simmons, Calculus with Analytic Geometry, 2<sup>nd</sup> Edition, McGraw Hill.
5. S. S. Sastry, Engineering Mathematics, Vol. 1, 4<sup>th</sup> Edition, PHI.

| Module | Teaching Hours | External Examination |              | Internal Mark | Total Mark | Credit |
|--------|----------------|----------------------|--------------|---------------|------------|--------|
|        |                | Aggregate Mark       | Maximum Mark |               |            |        |
| I      | 18             | 18                   | 12           | 12            | 60         | 4      |
| II     | 18             | 18                   | 12           |               |            |        |
| III    | 18             | 18                   | 12           |               |            |        |
| IV     | 18             | 18                   | 12           |               |            |        |
| Total  | 72             | 72                   | 48           | 12            | 60         |        |

## 2B02 MAT: Integral Calculus

### Module – I (18 hours)

Riemann sum and definite integrals, Properties, Mean Value theorem for definite integrals, Fundamental theorem of calculus (without proof), Substitution in definite integrals, Integration of hyperbolic functions, Reduction formulae.

(Sections 4.5 to 4.8 , 6.10 and 7.5 of Text 1)

### Module - II (15 hours)

Beta and gamma functions, introduction, The gamma function, Transformation of gamma function, Beta function, Evaluation of beta function,  $B(m,n)=B(n,m)$ , Transformation of beta function, Relationship between beta and gamma functions, Gamma function and trigonometric relations. (Sections 10.1 to 10.9 of Text 2)

### Module – III (21 hours)

Application of integration- Area between curves, Volume of solid of revolution length of curves, Length of parameterized curves, Area of surface of revolution, integration in parametric and polar co-ordinates. (Sections 5.1, 5.3, 5.5, 5.6, 9.5, 9.9 of Text 1)

### Module - IV (18 hours)

Multiple integrals, Double integrals, area of bounded region in the plane, (except the topics: Moments and Centers of Mass, Centroids of Geometric Figures) double integral in polar form, triple integral in rectangular co ordinates, triple integral in cylindrical and spherical co-ordinates. (sections 13.1 to 13.4, 13.6 of Text 1)

**Texts:** 1. G. B. Thomas and R. L. Finney, Calculus, 9<sup>th</sup> Edition .  
2. S. K. Sengar and S.P. Singh, Advanced Calculus, Cengage Learning India Pvt.

### References:

1. S. Narayanan and T.K.M. Pillay, Differential and Integral Calculus, S. Viswanathan Printers and Publishers, Chennai.
2. H. Anton, I. Bivens and S. Davis, Calculus, 7<sup>th</sup> Edition, Wiley.
3. S. K. Stein, Calculus with Analytic Geometry, McGraw Hill.
4. M.R. Spiegel, Theory and Problems of Advanced Calculus, Schaum's Series.
5. S. S. Sastry, Engineering Mathematics, Vol. 1, 4<sup>th</sup> Edition, PHI

| Module | Teaching Hours | External Examination |              | Internal Mark | Total Mark | Credit |
|--------|----------------|----------------------|--------------|---------------|------------|--------|
|        |                | Aggregate Mark       | Maximum Mark |               |            |        |
| I      | 18             | 18                   | 12           | 12            | 60         | 4      |
| II     | 15             | 15                   | 10           |               |            |        |
| III    | 21             | 21                   | 14           |               |            |        |
| IV     | 18             | 18                   | 12           |               |            |        |
| Total  | 72             | 72                   | 48           | 12            | 60         |        |



# 3B03 MAT: Elements of Mathematics I

## Module – I (20 hours)

Finite and Infinite sets, Countable and uncountable sets, Cantor's theorem, Logic and proofs (Section 1.3 and Appendix A of text 3)

Arguments, Logical implications, Propositional functions, Quantifiers, Negation of quantified statements. (Sections 10.9 to 10.12 of Text 1)

## Module – II (27 hours)

Basic concepts, Fundamental theorem of algebra (without proof), Relation between roots and coefficients, Symmetric functions of roots, Sum of the powers of roots, Newton's theorem on sum of the powers of roots, Transformation of equations, Reciprocal equations, Transformation in general. (Chapters 6: Sec 1 to 16 and 21 of Text 2)

## Module - III (18 hours)

Descartes rule of signs, Multiple roots, Sturm's theorem, Cardon's method, Solution of biquadratic equation (Chapters 6: Sec 24, 26, 27, 34.1 and 35 of Text 2).

## Module - IV (25 hours)

Divisibility theory in the integers – the division algorithm, the greatest common divisor, the Euclidean algorithm, the Diophantine equation  $ax + by = c$ . Primes and their distribution-fundamental theorem of arithmetic, the sieve of Eratosthenes. The theory of congruence-basic properties of congruence. (Sections 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 4.2 of Text 4)

- Texts:**
1. S. Lipschitz, Set Theory and Related Topics, 2<sup>nd</sup> Edition, Schaum's series.
  2. T. K. Manicavachagom Pillai, T. Natarajan and K. S. Ganapathy, Algebra Vol-1, S Viswanathan Printers and Publishers, 2010.
  3. R. G. Bartle & Donald R. Sherbert, Introduction to Real Analysis, 3<sup>rd</sup> Edition, Wiley.
  4. D. M. Burton, Elementary Number Theory, 7<sup>th</sup> Edition, TMH

### References:

1. C.Y. Hsiung, Elementary Theory of Numbers, Allied Publishers.
2. N. Robbins, Beginning Number Theory, Second Edition. Narosa.
3. G. E. Andrews, Number Theory, HPC.
4. M.D. Raisinghnia and R.S. Aggarwal, Algebra.
5. K.H. Rosen, Discrete Mathematics and its Applications, 6<sup>th</sup> Edition, Tata McGraw Hill Publishing Company, New Delhi.

| Module | Teaching Hours | External Examination |              | Internal Mark | Total Mark | Credit |
|--------|----------------|----------------------|--------------|---------------|------------|--------|
|        |                | Aggregate Mark       | Maximum Mark |               |            |        |
| I      | 20             | 15                   | 10           | 12            | 60         | 4      |
| II     | 27             | 21                   | 14           |               |            |        |
| III    | 18             | 15                   | 10           |               |            |        |
| IV     | 25             | 21                   | 14           |               |            |        |
| Total  | 90             | 72                   | 48           | 12            | 60         |        |

# 4B04 MAT: Elements of Mathematics II

## Module I (25 Hours)

Relations, Types of relations, Partitions, Equivalence relation, Partial ordering relation, Functions, Composition of functions, One to one, Onto and invertible functions, Mathematical functions (except exponential and logarithmic functions), Recursively defined functions. (Sections 3.3, 3.6, 3.8, 3.9, 3.10 and chapter 4 of Text 1 )

## Module II (20 Hours)

Ordered sets, Partially ordered sets and Hasse diagrams, Minimal and maximal elements, First and last elements, Supremum and infimum, Lattices. Bounded, distributive, Complemented lattices. (Chapter 7: Sections 7.2, 7.4, 7.5, 7.7, 7.10, 7.11 of Text 1)

## Module III (25 Hours)

Definition of conic, Parabola-ellipse-hyperbola, Some important results associated with the standard form of parabola-ellipse-hyperbola, General equation of parabola-ellipse-hyperbola, Position of a point with respect to a parabola-ellipse-hyperbola, Equation of tangent and normal at a point on a parabola-ellipse-hyperbola, Equation of chord of contact of a point with respect to a parabola-ellipse-hyperbola, Equation of pair of tangents from a given point, Parametric equation of a parabola-ellipse-hyperbola, Auxiliary circle and Eccentric angle, Rectangular hyperbola, Chord, tangent and normal of rectangular hyperbola, conjugate hyperbola. (Examples and problems after conormal points are not included --Sections 4.1 to 4.9, 5.1 to 5.9 and 6.1 to 6.12 of Text 2)

## Module –IV (20 Hours)

Rank of a matrix – Elementary transformation, reduction to normal form, row reduced echelon form, computing the inverse of a non singular matrix using elementary row transformation. (Section 4.1 to 4.13 of Text 3)

- Texts:**
1. S. Lipschitz, Set Theory and Related Topics, 2<sup>nd</sup> Edition, Schaum's Series.
  2. A. N. Das, Analytical Geometry of Two and Three Dimensions, NCBA, Reprint 2016.
  3. S. Narayanan and Mittal, A Text Book of Matrices, Revised Edition, S. Chand.

### References:

1. P. R. Vital, Analytical Geometry, Trigonometry and Matrices, Pearson Education
2. P.R. Halmos, Naive Set Theory, Springer.
3. E. Kamke, Theory of Sets, Dover Publishers.
4. D. Serre, Matrices, Theory and Applications, Springer.

| Module | Teaching Hours | External Examination |              | Internal Mark | Total Mark | Credit |
|--------|----------------|----------------------|--------------|---------------|------------|--------|
|        |                | Aggregate Mark       | Maximum Mark |               |            |        |
| I      | 25             | 22                   | 15           | 12            | 60         | 4      |
| II     | 20             | 14                   | 9            |               |            |        |
| III    | 25             | 22                   | 15           |               |            |        |
| IV     | 20             | 14                   | 9            |               |            |        |
| Total  | 90             | 72                   | 48           | 12            | 60         |        |

## 5B09 MAT: Graph Theory

### Module I – Basic Results(18Hours)

Introduction, Basic Concepts, Subgraphs, Degrees of Vertices, Paths and Connectedness, Line Graphs (Whitney's theorem without proof), Operations on Graphs. (Sections 1.1 to 1.8 except 1.6)

### Module II –Connectivity, Trees (24 Hours)

Introduction, Vertex Cuts and Edges Cuts, Connectivity and Edge Connectivity (Whitney's theorem without proof). Introduction, Definition, Characterization, and Simple Properties, Centers and Centroids, Counting the Number of Spanning Trees, (Sections 3.1 to 3.3 and 4.1 to 4.4)

### Module III – Independent Sets, Eulerian and Hamiltonian Graphs (18 Hours)

Introduction, Vertex-Independent Sets and Vertex Coverings, Edge-Independent Sets, Introduction, Eulerian Graphs, Hamiltonian Graphs, Hamilton's "Around the World" Game. (Sections 5.1 to 5.3, and 6.1 to 6.3 and 6.3.1)

### Module IV – Directed Graphs (12 Hours)

Introduction, Basic Concepts, Tournaments (Sections 2.1 to 2.3)

**Text:** R. Balakrishnan and K. Ranganathan, A Text Book of Graph Theory, 2<sup>nd</sup> Edition, Springer

#### References:

1. J.A. Bondy and U.S.R. Murty, Graph Theory with applications. Macmillan
2. F. Harary, Graph Theory, Narosa publishers
3. J. Clark and D. A. Holton, A First look at Graph Theory, Prentice Hall
4. K.R. Parthasarathy, Basic Graph Theory, Tata-McGraw Hill
5. J.A. Dossey, Discrete Mathematics, Pearson Education.

| Module | Teaching Hours | External Examination |              | Internal Mark | Total Mark | Credit |
|--------|----------------|----------------------|--------------|---------------|------------|--------|
|        |                | Aggregate Mark       | Maximum Mark |               |            |        |
| I      | 18             | 18                   | 12           | 12            | 60         | 3      |
| II     | 24             | 24                   | 16           |               |            |        |
| III    | 18             | 18                   | 12           |               |            |        |
| IV     | 12             | 12                   | 8            |               |            |        |
| Total  | 72             | 72                   | 48           | 12            | 60         |        |

Sd/-

Prof. Tom Joseph  
Chairman, BOS in Mathematics (UG).

KANNUR UNIVERSITY MODEL QUESTION PAPER  
**FIRST SEMESTER B.Sc. DEGREE EXAMINATION**

Mathematics (Core)

1B01MAT-Differential Calculus

Time: Three Hours

Maximum Marks: 48

**Section A**

*All the first 4 questions are compulsory. They carry 1 mark each.*

1. Find  $\lim_{x \rightarrow c} \frac{x^3 + 4x^2 - 3}{x^2 + 5}$ .
2. Fill in the blanks:  $\frac{d}{dx}(\coth x) = \dots\dots\dots$
3. Find the Cartesian form of the polar equation

$$r = \frac{8}{1 - 2\cos\theta}.$$

4. Find the polar coordinates corresponding to the Cartesian coordinate  $(-3, \sqrt{3})$ .

**Section B**

*Answer any 8 questions from among the questions 5 to 14. These questions carry 2 marks each.*

5. Find  $\lim_{h \rightarrow 0} \frac{\sqrt{2+h} - \sqrt{2}}{h}$ .
6. Find the inverse of  $y = \frac{1}{2}x + 1$ , expressed as a function of  $x$ .

7. If  $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \dots}}}$  prove that

$$(2y - 1)^2 y_2 + 2y_1 \cos x + (2y - 1) \sin x = 0.$$

8. Find the Cartesian and spherical co-ordinates of the point whose cylindrical coordinates is  $(1, \pi/2, 1)$ .
9. Translate the Cartesian equation  $x^2 + y^2 + z^2 = 4z$  into two other forms.
10. Verify Rolle's Theorem for the function  $f$  defined by

$$f(x) = (x - a)^m (x - b)^n,$$

where  $m$  and  $n$  being positive integers and  $x \in [a, b]$ .

11. Using Maclaurin's series expand  $e^{2x}$ .
12. Find points of inflection on the curve  $y = 3x^4 - 4x^3 + 1$ .
13. For the function  $f(x, y) = y - x$ ,
  - (a) find the function's domain,
  - (b) find the function's range, and
  - (c) describe the function's level curves.
14. Let  $f(x, y) = x^2 - xy + \frac{1}{2}y^2 + 12$ . Verify Euler's Mixed Derivative Theorem at the point  $(3, 2)$ .

### Section C

**Answer any 4 questions from among the questions 15 to 20. These questions carry 4 marks each.**

15. Show that

$$f(x) = \frac{x^2 + x - 6}{x^2 - 4}$$

is not continuous at  $x = 2$ , but has a continuous extension to  $x = 2$ , and find that extension.

16. Find the local and absolute extreme values of

$$f(x) = x^{\frac{1}{3}}(x - 4) = x^{\frac{4}{3}} - 4x^{\frac{1}{3}}.$$

17. Find the asymptotes of the curve

$$y = \frac{x + 3}{x + 2}.$$

18. Using l'Hôpital's Rule, evaluate  $\lim_{x \rightarrow 2^+} \frac{x^2 + 3x - 10}{x^2 - 4x + 4}$ .

19. Using Chain Rule, find  $\frac{dw}{dt}$  if

$$w = xy + z, \quad x = \cos t, \quad y = \sin t, \quad z = t.$$

What is the derivative's value at  $t = \frac{\pi}{2}$ .

20. Verify that  $\frac{\partial^2 f}{\partial x \partial y} = \frac{\partial^2 f}{\partial y \partial x}$ , where  $f = x^y$ .

### Section D

*Answer any 2 questions from among the questions 21 to 24. These questions carry 6 marks each.*

21. If  $y = (\sin^{-1} x)^2$ , prove that

$$(1 - x^2)y_{n+2} - (2n + 1)xy_{n+2} - n^2 y_n = 0.$$

22. Graph the function  $x^2 + y^2 + (z - 1)^2 = 1$ .

23. Find the centre of curvature and the evolute of the four cused hypocycloid  $x^{2/3} + y^{2/3} = a^{2/3}$ .

24. If  $u = \tan^{-1} \left( \frac{x^3 + y^3}{x - y} \right)$ ,  $x \neq y$  show that

(i)  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \sin 2u.$

(ii)  $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2} = (1 - 4 \sin^2 u) \sin 2u.$

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KANNUR UNIVERSITY MODEL QUESTION PAPER  
**SECOND SEMESTER B.Sc. DEGREE EXAMINATION**

Mathematics (Core)

2B02MAT-Integral Calculus

Time: Three Hours

Maximum Marks: 48

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**Section A**

*All the first 4 questions are compulsory. They carry 1 mark each.*

1. Define Gamma Integral.
2. State the Fundamental Theorem of Calculus.

3. Evaluate  $\int_0^1 \int_0^2 xy(x-y) dx dy$

4. Evaluate  $\int_0^1 \int_0^2 \int_0^2 x^2 yz dz dy dx$ .

**Section B**

*Answer any 8 questions from among the questions 5 to 14. These questions carry 2 marks each.*

5. Express the limit of Riemann sums

$$\lim_{\|P\| \rightarrow 0} \sum_{k=1}^n (3c_k^2 - 2c_k + 5) \Delta x_k$$

as an integral if  $P$  denotes a partition of the interval  $[-1, 3]$ .

6. Find the average value of  $f(x) = 4 - x^2$  on  $[0, 3]$ . Does  $f$  actually take on this value at some point in the given domain?
7. Find the area of the region between the  $x$ -axis and the graph of  $f(x) = x^3 - x^2 - 2x$ ,  $-1 \leq x \leq 2$ .

8. Evaluate  $\int_0^{\pi/2} 2 \sinh(\sin t) \cos t dt$ .

9. Find  $\int \tan^5 x dx$ .

10. Express  $\int_0^2 x(8-x^3)^{1/3} dx$  in terms of a Beta function.

11. Find the area between  $y = \sec^2 x$  and  $y = \sin x$  from 0 to  $\pi/4$ .

12. Find the area of the surface generated by revolving the arc of the catenary  $y = c \cosh \frac{x}{c}$  from  $x = 0$  to  $x = c$  about the  $x$ -axis.

13. Find the length of the astroid

$$x = \cos^3 t, \quad y = \sin^3 t, \quad 0 \leq t \leq 2\pi$$

14. Evaluate

$$\iint_R e^{x^2+y^2} dy dx,$$

where  $R$  is the semicircular region bounded by the  $x$ -axis and the curve  $y = \sqrt{1-x^2}$

### Section C

**Answer any 4 questions from among the questions 15 to 20. These questions carry 4 marks each.**

15. Show that if  $f$  is continuous on  $[a, b]$ ,  $a \neq b$ , and if  $\int_a^b f(x) dx = 0$ , then  $f(x) = 0$  at least once in  $[a, b]$ .

16. Show that  $\Gamma(1/2) = \sqrt{\pi}$ .

17. Find the volume of the solid generated by revolving the region bounded by  $y = \sqrt{x}$  and the lines  $y=1$ ,  $x=4$  about the line  $y=1$ .

18. For the catenary  $y = c \cosh \frac{x}{c}$ , show that  $y^2 = c^2 + s^2$ , where  $s$  is the length of the arc measured from its vertex to the point  $(x, y)$ .

19. Change the order of integration and hence evaluate the double integral  $\int_0^1 \int_{e^x}^e \frac{dx dy}{\log y}$

20. Change the following Cartesian integral into an equivalent polar integral and solve it.



$$\iint_R e^{x^2+y^2} dydx,$$

where  $R$  is the semi circular region bounded by the  $x$  – axis and the curve  $y = \sqrt{1-x^2}$ .

### Section D

**Answer any 2 questions from among the questions 21 to 24. These questions carry 6 marks each.**

21. Show that

$$\int x \sin^{-1} x dx = \left( \frac{x^2}{2} - \frac{1}{4} \right) \sin^{-1} x + \frac{1}{4} x \sqrt{1-x^2} + C,$$

where  $C$  is an arbitrary constant.

22. To prove that  $\beta(m, n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$ .

23. Find the area of the surface generated by revolving the right-hand loop of the lemniscate  $r^2 = \cos 2\theta$  about the  $y$  – axis.

24. Find the volume of the upper region  $D$  cut from the solid sphere  $\rho \leq 1$  by the cone  $\phi = \pi/3$ .

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**THIRD SEMESTER B.Sc. DEGREE EXAMINATION**

Mathematics (Core)

**3B03MAT-Elements of Mathematics - I**

Time: Three Hours

Maximum Marks: 48

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**Section A**

*All the first 4 questions are compulsory. They carry 1 mark each.*

1. Fill in the blanks: If  $A$  is a set with  $m \in \mathbb{N}$  elements and  $C \subseteq A$  is a set with 1 element, then  $A \setminus C$  is a set with ..... elements.
2. Give the remainder obtained when a polynomial  $f(x)$  is divided by  $x - a$ .
3. State Sturm' Theorem.
4. State True/False: Square of any integer is either  $3k$  or  $3k + 1$ .

**Section B**

*Answer any 8 questions from among the questions 5 to 14. These questions carry 2 marks each.*

5. Prove that if  $A$  and  $B$  are denumerable, then  $A \cup B$  is denumerable.
6. Show that  $\sqrt{2}$  is irrational.
7. Form the polynomial equation of fourth degree with rational coefficients, one of whose roots is  $\sqrt{2} + \sqrt{-3}$ .
8. If  $\alpha, \beta$  and  $\gamma$  are the roots of the equation  $x^3 + ax^2 + bx + c = 0$ , form the equation whose roots are  $\alpha\beta, \beta\gamma$  and  $\gamma\alpha$ .
9. If  $\alpha, \beta, \gamma, \delta$  are the roots of

$$x^4 + px^3 + qx^2 + rx + s = 0,$$

find the value of  $\sum \alpha^2\beta$ .

10. Discuss the nature of roots of the equation

$$x^9 + 5x^8 - x^3 + 7x + 2 = 0.$$

11. Find the multiple roots of the equation  $x^4 - 9x^2 + 4x + 12 = 0$ .

12. Show that the expression  $\frac{a(a^2 + 2)}{3}$  is an integer for all  $a \geq 1$ .

13. If  $a$  and  $b$  are given integers, not both zero, then prove that the set

$$T = \{ax + by \mid x, y \text{ are integers}\}$$

is precisely the set of all multiples of  $d = \gcd(a, b)$ .

14. Let  $n > 1$  be fixed and  $a, b$  be arbitrary integers. Then prove the following properties:

(a)  $a \equiv a \pmod{n}$ .

(b) If  $a \equiv b \pmod{n}$ , then  $b \equiv a \pmod{n}$ .

### Section C

*Answer any 4 questions from among the questions 15 to 20. These questions carry 4 marks each.*

15. State and prove Cantor's Theorem.

16. Prove that in a polynomial equation with real coefficients imaginary roots occur in conjugate pairs.

17. Solve the reciprocal equation

$$60x^4 - 736x^3 + 1433x^2 - 736x + 60 = 0.$$

18. Solve the equation  $x^3 + x^2 - 16x + 20 = 0$ , given that some of its roots are repeated.

19. Prove that the linear Diophantine equation  $ax + by = c$  has a solution if and only if  $d \mid c$ , where  $d = \gcd(a, b)$ .

20. Prove that there are infinitely many primes.

### Section D

*Answer any 2 questions from among the questions 21 to 24. These questions carry 6 marks each.*

21. (a) Show that the propositions  $p \rightarrow q$  and  $\neg p \vee q$  are logically equivalent

(b) Use quantifiers to express the statement “There is a woman who has taken a flight on every airline in the world.”

22. If  $\alpha, \beta, \gamma$  are the roots of  $x^3 - x - 1 = 0$ , find the equation whose roots are

$$\frac{1+\alpha}{1-\alpha}, \frac{1+\beta}{1-\beta}, \text{ and } \frac{1+\gamma}{1-\gamma}.$$

Hence write down the value of  $\sum \frac{1+\alpha}{1-\alpha}$ .

23. Solve the cubic

$$x^3 - 9x + 28 = 0$$

by Cardan’s method.

24. State and prove the Fundamental Theorem of Arithmetic.

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KANNUR UNIVERSITY MODEL QUESTION PAPER  
**FOURTH SEMESTER B.Sc. DEGREE EXAMINATION**

Mathematics (Core)

**4B04 MAT-Elements of Mathematics - II**

Time: Three Hours

Maximum Marks: 48

**Section A**

*All the first 4 questions are compulsory. They carry 1 mark each.*

1. Let  $A = \{1, 2\}$  and  $B = \{a, b, c\}$ . Then  $A \times B = \dots\dots\dots$
2. Give the partition of the set  $S = \{a, b, c, d\}$  that contain 4 distinct cells.
3. Give the rank of the matrix  $\begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$
4. Find the matrix that is obtained by multiplying second row of the following matrix by 7.

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 5 & 3 & 7 \\ 0 & 4 & 9 & 10 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

**Section B**

*Answer any 8 questions from among the questions 5 to 14. These questions carry 2 marks each.*

5. Let  $A$  be a set of nonzero integers and let  $\approx$  be the relation on  $A \times A$  defined as follows:

$$(a, b) \approx (c, d) \text{ whenever } ad = bc$$

Prove that  $\approx$  is an equivalence relation.

6. Let the function  $f$  and  $g$  be defined by  $f(x) = 2x + 1$  and  $g(x) = x^2 - 2$ . Find the formula defining the composition functions: (a)  $g \circ f$ ; (b)  $f \circ g$
7. Let  $n$  denote a positive integer. Suppose a function  $L$  is defined recursively as follows:

$$L(n) = \begin{cases} 0 & \text{if } n = 1 \\ L(\lfloor n/2 \rfloor) + 1 & \text{if } n > 1 \end{cases} \quad \text{where } \lfloor x \rfloor \text{ denotes the floor of } x. \text{ Find } L(25).$$

8. Define the following . Give one example to each:

- i. Bounded Lattice.
- ii. Distributive Lattice.
- iii. Non-distributive Lattice.
- iv. Join Irreducible elements.

9. Give an example of a collection  $S$  of sets ordered by set inclusion, and a subcollection  $A = \{A_i : i \in I\}$  of  $S$  such that  $B = \bigcup_i A_i$  is not an upper bound of  $A$ .

10. Find the focus, directrix, latus rectum and vertex of the parabola  $y^2 = 4x$  .

11. Find the equation of an ellipse whose focus is (3,1) directrix is  $x - y + 6 = 0$  and eccentricity is  $\frac{1}{2}$ .

12. Let  $P(ct_1, c/t_1)$  and  $Q(ct_2, c/t_2)$  be any two points on the rectangular hyperbola  $xy = c^2$ . Find the equation of the chord PQ.

13. Find the equations of conjugate hyperbola and auxiliary circle of the hyperbola

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 .$$

14. Reduce to normal form the matrix  $A = \begin{bmatrix} 2 & -2 & 0 & 6 \\ 4 & 2 & 0 & 2 \\ 1 & -1 & 0 & 3 \\ 1 & -2 & 1 & 2 \end{bmatrix}$

### Section C

**Answer any 4 questions from among the questions 15 to 20. These questions carry 4 marks each.**

15. Suppose  $P = \{A_i\}$  is a partition of a set  $S$ . Then there is an equivalence relation  $R$  on  $S$  such that the quotient set  $S/R$  of equivalence classes is same as the partition  $P = \{A_i\}$  . .

16. Determine if each of the following functions is one-to-one:

- (a) To each person on the earth assign the number which corresponds to his age.
- (b) To each country in the world assign the latitude and longitude of its capital.
- (c) To each state in India assign the name of its capital.
- (d) To each book written by only one author assign the author.

- (e) To each country in the world which has a prime minister assign its prime minister.
17. Let  $L$  be a lattice. Prove the following:
- $a \wedge b = a \Leftrightarrow a \vee b = b$ .
  - The relation  $a \leq b$  (defined by  $a \wedge b = a$ ) is a partial order on  $L$ .
18. Find the equation of chord of contact of tangents from  $(h, k)$  to the parabola  $y^2 = 4ax$ .
19. Obtain the equation of the pair of tangents from  $(h, k)$  to the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .
20. Find the rank of the following matrix by reducing it to the row reduced echelon form:

$$A = \begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$$

#### Section D

**Answer any 2 questions from among the questions 21 to 24. These questions carry 6 marks each.**

21. Consider the set  $\mathbb{Z}$  of integers. Define  $aRb$  if  $b = a^r$  for some positive integer  $r$ . Show that  $R$  is a partial ordering on  $\mathbb{Z}$ .
22. Let  $L$  be a finite distributive lattice. Then show that every  $a$  in  $L$  can be written uniquely as the join of redundant join-irreducible elements.
23. Find the equation of the tangent and normal at a point  $(h, k)$  on the hyperbola  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ .
24. Using elementary row transformations, compute the inverse of the matrix

$$A = \begin{bmatrix} -1 & -3 & 3 & -1 \\ 1 & 1 & -1 & 0 \\ 2 & -5 & 2 & -3 \\ -1 & 1 & 0 & 1 \end{bmatrix}$$

KANNUR UNIVERSITY MODEL QUESTION PAPER  
**FOURTH SEMESTER B.Sc. DEGREE EXAMINATION**

Mathematics (Core)

5B09 MAT-Graph Theory

Time: Three Hours

Maximum Marks: 48

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**Section - A**

*(Answer all the Questions, Each Question carries one marks.)*

1. State the Whitney's theorem.
2. Define Euler Graphs.
3. Define Tournaments.
4. A simple graph  $G$  with  $n$  vertices,  $n \geq 2$ ; is complete if and only if  $\kappa(G) =$

**Section - B**

*(Answer any Eight Questions, Each Question carries two Marks.)*

5. Prove that the number of vertices of odd degree is even.
6. Prove that if a simple graph  $G$  is not connected then  $G^c$  is connected.
7. Prove that every connected graph contains a spanning tree.
8. Prove that an edge  $e = xy$  is a cut edge of a connected graph  $G$  if and only if there exist vertices  $u$  and  $v$  such that  $e$  belongs to every  $u - v$  path in  $G$ .
9. Prove that for any graph  $G$  with  $n$  vertices,  $\alpha + \beta = n$
10. Define Digraph, in degree and out degree with an example.
11. Prove that every tournament contains a directed Hamiltonian path.
12. Explain Directed Walk, Directed path, and Directed cycle.
13. Explain disconnected in a Digraph.
14. A subset  $S$  of  $V$  is independent if and only if  $V - S$  is a covering of  $G$ .



Section - C

(Answer any four Questions, Each Question carries four Marks.)

15. Explain the different operations on Graphs with examples.
16. Prove that the line graph of a simple graph  $G$  is a path if and only if  $G$  is a path.
17. Prove that the number of edges in a tree on  $n$  vertices is  $n - 1$ .
18. Prove that for a connected a graph  $G$  with at least two vertices contains at least two vertices that are not cut vertices.
19. Prove that for a simple graph  $G$  with  $n \geq 3$  vertices, if for every pair of nonadjacent vertices  $u, v$  of  $G$ ,  $d(u) + d(v) \geq n$ , then  $G$  is Hamiltonian.
20. Prove that every vertex of a disconnected tournament  $T$  on  $n$  vertices with  $n \geq 3$  is contained in a directed  $k$ -cycle,  $3 \leq k \leq n$ .

Section - D

(Answer any two Questions, Each Question carries six Marks.)

21. a) Define bipartite Graph.  
b) Prove that a Graph  $G$  is bipartite if and only if it contains no odd cycles.
22. Prove that for any loop less connected graph  $G$ ,  $\kappa(G) \leq \lambda(G) \leq \delta(G)$   
Give an example with strict inequality hold.
23. a) Define Centre and Centroids of a Graph.  
b) Prove that every tree has centre consisting of either a single vertex or two adjacent vertices
24. Prove that for any non trivial connected graph  $G$ , the following statements are equivalent:
  - a)  $G$  is Eulerian.
  - b) The degree of each vertex of  $G$  is an even positive integer.
  - c)  $G$  is an edge disjoint union of cycles.

Tom Joseph

  
**KANNUR UNIVERSITY**  
(Abstract)

(MCJ) Master of Communication and Journalism Programme - under Credit Based Semester System in Affiliated Colleges - Revised Scheme, Syllabus & Model Question Papers- Implemented with effect from 2016 Admission - Orders issued.

**ACADEMIC C SECTION**

U.O No. Acad/C1/10822/2014

Civil Station (PO), Dated, 11-07-2016

- Read: 1. U.O.No.Acad C1/11460/2013 dtd 12-03-2014  
2. U.O.of even No dtd 29-08-2014  
3. U.O.No.Acad C1/11460/2013 dated 05-12-2015 & 22-02-2016  
4. Minutes of the meeting of the Board of Studies in Journalism & Mass Communication(Cd) held on 25-02-2016  
5. U.O. of even No dtd 31-03-2016  
6. Letter dated 27-06-2016 from the Chairman, Board of Studies in Journalism & Mass Communication(Cd)

**ORDER**

1. The Regulations for Credit Based Semester System for P.G. Programmes in affiliated Colleges were implemented in the University with effect from 2014 admission vide paper read (1) above and certain modifications were effected to the same vide paper read (3) above.

2. As per the paper read (2) above, the Scheme, Syllabus & Model Question papers for Master of Communication and Journalism (MCJ) Programme were implemented in the University under Credit Based Semester System w.e.f. 2014 admission.

3. As certain anomalies were reported in the existing MCJ Syllabus implemented w.e.f 2014 admission and since the question paper setting of 2014 admission 3<sup>rd</sup> Sem and 2015 admission 1<sup>st</sup> Semester was over, the BOS vide paper read (4) above, decided to follow the existing Syllabus for 2014 & 2015 admission and the above decision of the board was implemented vide paper read (5) above. The Board of Studies also decided to revise the Syllabus w.e.f 2016 admission in the light of decision of the meeting and approved the restructured Syllabus by correcting the anomalies to be implemented w.e.f.2016 admission.

4. The Chairman Board of Studies in Journalism & Mass Communication (Cd) vide paper read (6) above has forwarded the revised Scheme, Syllabus and Model Question paper for Master of Communication and Journalism (MCJ) Programme for implementation with effect from 2016 admission.

5. The Vice Chancellor after considering the matter in detail, and in exercise of the powers of the Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement the revised Scheme, Syllabus and Model Question papers as recommended by the Board of Studies in Journalism and Mass Communication (Cd) under Credit Based Semester System in affiliated Colleges with effect from 2016 admission, subject to report to the Academic Council.

6. Orders are, therefore, issued accordingly.

7. The revised Scheme, Syllabus and Model Question Papers w.e.f 2016 admission are appended.

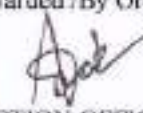
Sd/-  
**JOINT REGISTRAR (ACADEMIC)**  
For REGISTRAR

To  
The Principals of Colleges offering MCJ Programmes

Copy to:

1. The Examination Branch (through PA to CE).
2. The Chairman BOS in Mass Communication & Journalism (Cd)
3. SF/DF/FC.

Forwarded /By Order

  
SECTION OFFICER

For more details; log on [www.kannur-university.ac.in](http://www.kannur-university.ac.in)



**KANNUR**  **UNIVERSITY**

**REVISED SCHEME AND SYLLABUS FOR  
PG PROGRAMME IN**

**Master of Communication and Journalism  
(MCJ)**

**UNDER CREDIT BASED SEMESTER SYSTEM**

**KU CBSS-PG-2014**

**FOR**

**AFFILIATED COLLEGES UNDER KANNUR UNIVERSITY**

**From 2016 ADMISSION onwards**

**Prepared and offered by:** *Board of Studies of Journalism  
and Mass Communication, Kannur University*

# **MCJ Programme SYLLABUS for Affiliated Colleges in Kannur University w.e.f 2016**

## **Master of Communication and Journalism**

The syllabi of MCJ programme offered in the affiliated colleges of the university under semester system have been revised in the light of the decision of the meeting of the Board of studies, Journalism and Mass Communication held on 25/02/2016. The revised syllabi shall apply to MCJ programmes conducted by the affiliated colleges of Kannur university with effect from the academic year 2016-17 (2016 admission onwards) and regulations of PG Programme of Kannur University (KUCBSS –PG-2014 ) - U.O. No: Acad/C1/11460/2013 Dated 12/03/2014 and the revised order No.Acad/C1/11460/2013 Dated 05/12/2015 and 22.02.2016 shall be applicable to the MCJ Programme implemented w.e.f. 2016 admission.

### **I. Programme structure:**

#### **I Semester -from June to October**

| No    | Core / Elective | Course Code | Title of the Course                | Hours allotted per week | Credits | Marks |     |       |
|-------|-----------------|-------------|------------------------------------|-------------------------|---------|-------|-----|-------|
|       |                 |             |                                    |                         |         | CA    | ESE | Total |
| 1     | Core            | MCJ 1C 01   | Introduction to Mass Communication | 06                      | 04      | 15    | 60  | 75    |
| 2     | Core            | MCJ 1C 02   | Reporting for Newspapers           | 06                      | 04      | 15    | 60  | 75    |
| 3     | Core            | MCJ 1C 03   | Editing for Newspapers             | 06                      | 04      | 15    | 60  | 75    |
| 4     | Core            | MCJ 1C 04   | Television Production              | 07                      | 04      | 15    | 60  | 75    |
| Total |                 |             |                                    | 25                      | 16      | 60    | 240 | 300   |

## II Semester -from November to March

| No    | Core / Elective | Course Code | Title of the Course                                                                      | Hours allotted per week | Credits | Marks                   |                     |       |
|-------|-----------------|-------------|------------------------------------------------------------------------------------------|-------------------------|---------|-------------------------|---------------------|-------|
|       |                 |             |                                                                                          |                         |         | CA                      | ESE                 | Total |
| 1     | Core            | MCJ 2C 05   | Media Laws and Ethics                                                                    | 04                      | 04      | 15                      | 60                  | 75    |
| 2     | Core            | MCJ 2C 06   | Magazine Journalism                                                                      | 04                      | 04      | 15                      | 60                  | 75    |
| 3     | Core            | M CJ 2C 07  | Communication Theories                                                                   | 04                      | 04      | 15                      | 60                  | 75    |
| 4     | Core            | MCJ 2C 08   | Radio Production                                                                         | 04                      | 04      | 15                      | 60                  | 75    |
| 5     | Elective**      | MCJ 2E 01   | Photo Journalism                                                                         | 04                      | 04      | 15                      | 60                  | 75    |
| 6     | Elective**      | MCJ 2E 02   | Travel Journalism                                                                        |                         |         |                         |                     |       |
| 7     | Elective**      | MCJ 2E 03   | Health Communication                                                                     |                         |         |                         |                     |       |
| 8     | Practical – I   | MCJ 2 P 01  | Newspaper production , Video production,<br><br>Magazine production and Radio production | 05                      | 02      | 10<br>(2.5+2.5+2.5+2.5) | 40<br>(10+10+10+10) | 50    |
| Total |                 |             |                                                                                          | 25                      | 22      | 85                      | 340                 | 425   |

**\*\* Select one elective from this group**

**III Semester -from June to October**

| No    | Core / Elective | Course Code | Title of the Course                          | Hours allotted per week | Credits | Marks |     |       |
|-------|-----------------|-------------|----------------------------------------------|-------------------------|---------|-------|-----|-------|
|       |                 |             |                                              |                         |         | CA    | ESE | Total |
| 1     | Core            | MCJ 3C 09   | Public Relations and Corporate Communication | 05                      | 04      | 15    | 60  | 75    |
| 2     | Core            | MCJ 3C 10   | Advertising                                  | 05                      | 04      | 15    | 60  | 75    |
| 3     | Core            | MCJ 3C 11   | Mass communication Research                  | 05                      | 04      | 15    | 60  | 75    |
| 4     | Core            | MCJ 3C 12   | Television Journalism                        | 05                      | 04      | 15    | 60  | 75    |
| 5     | Elective**      | MCJ 3E 04   | Indian Politics and Communication            | 05                      | 04      | 15    | 60  | 75    |
| 6     | Elective**      | MCJ 3E 05   | Agricultural Journalism                      |                         |         |       |     |       |
| 7     | Elective**      | MCJ 3E 06   | Business Journalism                          |                         |         |       |     |       |
| 8     | Elective**      | MCJ 3E 07   | Development Communication                    |                         |         |       |     |       |
| Total |                 |             |                                              | 25                      | 20      | 75    | 300 | 375   |

**\*\* Select one elective from this group**

**IV Semester- from November to March**

| No    | Core / Elective | Course Code   | Title of the Course                                                   | Hours allotted per week | Credits | Marks             |                  |       |
|-------|-----------------|---------------|-----------------------------------------------------------------------|-------------------------|---------|-------------------|------------------|-------|
|       |                 |               |                                                                       |                         |         | CA                | ESE              | Total |
| 1     | Core            | MCJ<br>4C 13  | Introduction to Cinema                                                | 05                      | 04      | 15                | 60               | 75    |
| 2     | Core            | MCJ<br>4C 14  | New Media and Online Journalism                                       | 05                      | 04      | 15                | 60               | 75    |
| 3     | Elective**      | MCJ<br>4E 08  | Technical Writing                                                     | 05                      | 04      | 15                | 60               | 75    |
| 4     | Elective**      | MCJ<br>4E 09  | Fashion Communication                                                 |                         |         |                   |                  |       |
| 5     | Elective**      | MCJ<br>4E 10  | Sports Journalism                                                     |                         |         |                   |                  |       |
| 6     | Practical – II  | MCJ<br>4P 02  | PSA production, TV News bulletin production and Short film production | 05                      | 02      | 10<br>(2.5+2.5+5) | 40<br>(10+10+20) | 50    |
| 7     | Project         | MCJ<br>4Pr    | Dissertation                                                          | 05                      | 03      | 10                | 40               | 50    |
|       |                 |               | Internship*                                                           | -                       | 02      | 25                | -                | 25    |
| 8     | Viva Voce       | MCJ<br>4 C 15 | Viva Voce                                                             | --                      | 03      |                   | 50               | 50    |
| Total |                 |               |                                                                       | 25                      | 22      | 90                | 310              | 400   |

**\*\* Select one elective from this group**

**\*Marks for internship should be allotted by the HOD**

- a. Total marks for semester – I -300
- b. Total marks for semester – II- 425
- c. Total marks for semester – III- 375
- d. Total marks for semester – IV- 400
- e. Total marks for semester I to IV- 1500

## **II. Practicals**

### **Practical –I**

#### **MCJ 2 P 01 Newspaper production, Video production, Magazine production and Radio production.**

##### **1. Lab Newspapers: 5 Marks**

Each student shall submit five single-page printed A3-size lab-newspapers either in Malayalam or in English, prepared as part of reporting assignments within the semester, to be evaluated by external examiners.

##### **2. Newspaper Front Page: 5 Marks**

Each student shall edit and design the front page of an A3-size newspaper either in Malayalam or in English, with the stories given by the external examiners.

##### **3. Video production: 10 Marks**

Students, divided into teams of four members each, shall produce a video of their choice without dialogue limited to five minutes, during the semester and submit it for external valuation.

##### **4. Magazine production: 10 Marks**

Students shall be divided into teams of five members each, to bring out a printed multi-color 32-page-magazine either in Malayalam or in English, reported, subbed and designed by them during the semester. It shall be submitted for external valuation.

##### **5. Radio production: 10 Marks**

Each student shall produce a seven minutes radio feature / documentary on a topic and submit it for external valuation.



## **Practical –II**

### **MCJ 4P 02 PSA production, TV News bulletin production and Short film production**

#### **1. PSA production: 10 Marks**

Each student shall produce a Public Service Advertisement (PSA) in print/ audio/ visual format and submit it for external valuation.

#### **2. TV News bulletin production: 10 Marks**

Students either in groups of 4-5 or individually shall report, edit and present a news bulletin either in Malayalam or in English and submit it for external valuation. The duration of a solo news bulletin shall be seven minutes while for group productions it will be 25 minutes.

#### **3. Short film production: 20 Marks**

Students divided into teams of four or five members each shall produce either a documentary or a short film of 15-minutes, in Malayalam or English, within the semester and submit it for external valuation.

### **III. Dissertation:**

In the fourth semester each student shall submit a dissertation on any topic of his/her interest. The dissertation aims at introducing the students with research methodology and to prepare them for doing further research .Students are required to do a dissertation on a topic relating to an area of study chosen in consultation with the faculty. Each student shall be guided in his/her project by a member of the faculty.

#### **IV. VIVA:**

A Viva Voce examination will be conducted at the end of IV semester covering the whole programme including the project.

## **First Semester**

### **MCJ 1C 01 : Intoduction to Mass Communication**

#### **Module I**

**Definition and elements of communication; intra, interpersonal, group and mass communication; verbal and non-verbal communication**

#### **Module II**

**Concept of mass communication; functions of mass communication; strengths and limitations of print, radio, television, film, new media and folk media**

#### **Module III**

**Communication models - Aristotle, Lasswell, Shannon and Weaver, Schramm, Berlo, Andersch-Staats- and Bostorn model, Dance model and Barnlund model**

#### **Module IV**

**Models of mass communication process – transmission, expression, publicity and reception, Westley and MacLean, Riley and Riley and Maletzke**

#### **Module V**

**Flow theories- gatekeeper, gatekeeping models of White, Galtung and Ruge; news flow model - McNelly, Bass and Mowlana; uses and gratifications theory**

#### **Module VI**

**Normative theories of media performance – authoritarian theory, libertarian theory, social responsibility theory, communist theory, development media theory and democratic-participant media theory**

### **Books for Reference**

1. Joseph A Devito : Communicology: Introduction to the study of Communication
2. Joseph R. Dominick : The Dynamics of Mass Communication
3. Denis McQuail : McQuail's Mass Communication Theory
4. Melvin L. Defleur : Fundamentals of Human Communication
5. Denis McQuail and Sven Windhal : Communication Models
6. Aglee, Ault & Emury : Main Currents in Mass Communication
7. J. V. Vilanilam : Mass Communication
8. Melvin L Deflur& Sandra Ball-Rokaech : Mass Communication Theory
9. Vir Bala Aggarwal, V. S. Gupta : Handbook of Journalism and Mass Communication

### **Books for Further Reading**

- Marshall McLuhan : Understanding Media
- David K Berlow : The Process of Communication
- Kuppuswami : Communication and Social Change
- Keval J Kumar : Mass Communication in India
- D S Mehta : Mass Communication and Journalism in India
- Dr. J V Vilanilam : Mass Communication in India

## **I. Continuous Assessment -Total marks 15**

### **1. Class Test: (6 marks)**

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module six.

### **2. Attendance: (4 marks)**

Allotment of marks as per University regulations.

### **3. Seminar: (2.5 marks)**

Power point presentation by each student on current trends, challenges and issues in the field of communication.

### **4. Assignments: (2.5 marks)**

## **II. End Semester Examination: 60 Marks**

**Model Question Paper**

**MCJ Degree Examination**

**MCJ 1C 01:Introduction to Mass Communication**

**Time: 3 Hours**

**Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I. Write short notes on any FOUR of the following:**

1. Information society
2. Demassification
3. Global village
4. Information Society
5. Feedback
6. Gatekeeper

**II. Compare and contrast the characteristics of print media with electronic media.**

**III. Describe the process of communication with the help of Berlo's model.**

**IV. Bring out the differences between the libertarian theory and social responsibility theory.**

**V. Explain the functions and dysfunctions of mass communication.**

**VI. Critically examine the uses and gratifications theory.**

**VII. Define communication and explain the types of communication.**

**VIII. Discuss the models of communication process.**

## **MCJ: First Semester**

### **MCJ 1C 02: Reporting for Newspapers**

#### **Module I**

A brief history of newspaper journalism in India - early English and Malayalam newspapers and editors; English and Malayalam newspaper journalism today; Journalism as mission and profession - Journalist as reporter, interpreter, investigator, reformer, watchdog and activist; qualities and responsibilities of a reporter; reporting terminology

#### **Module II**

Definition and ingredients of news; types of news - hard and soft news, human interest stories, straight news, interpretative stories, brights, follow-ups, roundups and sidebars ; News structure - inverted pyramid, narrative, hourglass and focus; variety in leads; new journalism; precision journalism

#### **Module III**

News sources – news agencies, news releases, news conferences, news briefs, meet-the-press, beats and other media; tapping news sources; source credibility and attribution; off-the-record; Computer Assisted Reporting (CAR)

#### **Module IV**

Interviewing - news and personality interviews, telephonic and online interviews - interviewing hazards and tactics, research, angle, questions and presentation formats

#### **Module V**

Reporting accidents, natural calamities, natural and unnatural deaths, communal and political violence, terrorism, crime, sports, politics, elections, education, speech, seminar, environment, science, and technology, agriculture, budget, business and entertainment

#### **Module VI**

Investigative reporting – major scoops, undercover journalism, sting operation, public interest versus invasion of privacy, yellow journalism and Press Council of India's guidelines; citizen journalism

#### **Module VII**

News filters - adversarial journalism, advocacy journalism, advertorials, chequebook journalism, embedded journalism, gonzo journalism, lapdog journalism, mojo and sojo, market-driven journalism, Mc Journalism, media scrum, newszak and tabloidization; ombudsman

### Books for Reference

1. Melvin Mencher, **News Reporting and Writing**, New York, Oxford University Press, 2007
2. Jerry Lanson and Mitchell Stephens, **Writing and Reporting the News**, New York: Oxford University Press, 2008.
3. Fred Fedler and John Bender, **Reporting for the Media**, New York: Oxford University Press, 2001
4. Ambrish Saxena, **Fundamentals of Reporting and Editing**, New Delhi: Kanishka Publishers, 2007
5. Bob Franklin and Martin Hamer, **Key Concepts in Journalism Studies**, New Delhi: Vistaar Publications, 2006.
6. Tony Harcup, **Journalism: Principles and Practice**, New Delhi: Sage Publications, 2004.
7. Lynette Sheridan Burns, **Understanding Journalism**, New Delhi: Sage Publications, 2002.
8. Joan Clayton, **Interviewing for Journalists**, London: Piatkus Publishers, 1994
9. Hugo de Burgh, **Investigative Journalism: Context and Practice**, London: Routledge, 2000.
10. Straubhaar Larose, **Media Now**, New York: Thomson Wadsworth, 2004
11. Vanita Kohli-Khandekar, **The Indian Media Business**, New Delhi: Sage Publications, 2006

### Books for Further Reading

1. B.G. Verghese (Ed.), **Breaking the Big Story; Great Moments in Indian Journalism**, New Delhi: Penguin Books, 2003.
2. David Randall, **The Great Reporters**, London: Pluto Press, 2005.
3. T.J.S. George, **Lessons in Journalism: The Story of Pothan Joseph**, New Delhi: Viva Books, 2007
4. Anita Pratap, **Island of Blood**, New Delhi: Penguin Books, 2002
5. B. G. Verghese, **Warrior of the Fourth Estate: Ramnath Goenka of the Express**, New Delhi: Penguin Books, 2005



6. Kuldip Nayar, **Scoop: Inside Stories from the Partition to the Present**, New Delhi: HarperCollins Publishers, 2006
7. Edward Herman & Noam Chomsky, **Manufacturing Consent: The Political Economy of the Mass Media**, New York: Vintage, 1994
8. Bob Woodward, **The Secret Man: The Story of Watergate's Deep Throat**, London: Simon & Schuster, 2005.
9. P. Sainath, **Everybody Loves a Good Drought**, New Delhi: Penguin Books, 2004.
10. Laurence Campbell and Roland Wolseley, **How to Report and Write the News**, New York; Prentice-Hall, 1961
11. Shanti Swarrop Singh, **The Press and the Indian Parliament**, New Delhi, Classical Publishing Company, 2001
12. Curtis Macdougall, **Interpretative Reporting**, London; Macmillan Company, 1970
13. Carl Warren, **Modern News Reporting**, New York: Harper & Brothers Publications, 1968

#### **I. Continuous Assessment: 15 Marks**

##### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: One, at the completion of module four and the second, at the completion of module seven.

##### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations.

##### **3. Interview Assignment : 2.5 Marks**

Each student shall submit a personality interview for assessment

##### **4. Seminar Presentation : 2.5 Marks**

#### **II. End semester examination: 60 Marks**

**Model Question Paper**

**First Semester MCJ Degree Examination**

**MCJ 1C 02: Reporting for Newspapers**

**Time: 3 Hours**

**Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following.

1. Computer Assisted Reporting
2. Process Journalism
3. Readers' Editor
4. Chequebook Journalism
5. Broadloidization
6. Media Activism

**II.** Today journalism all at once is a mission, a profession and a business. Substantiate the demands and constraints placed on the journalists in their career in the current scenario.

**III.** Investigative reporting presupposes persistence, painstaking research and perilous risks. Comment on the challenges involved in scoops and exclusives, with suitable examples.

**IV.** The lead, the central part of a story can be written creatively with multifarious styles. Present any 12 popular innovative intros used in the newspapers today.

**V.** A journalist is neither a stenographer nor a historian, but is a reporter, a reformer and an activist. Comment on this statement explaining the prerequisites for a successful journalistic interview.

**VI.** The heart of newsgathering for a newspaper is the beat and extracting information is an art. Explain the rudiments of beat reporting and cultivation of news sources.

**VII.** Crime unreported is crime licensed and encouraged. Explain with examples the efficacy and challenges of crime reporting without going to the extremes of sensationalism.

**VIII.** To a journalist any event is a STORY to be reported. To a historian any event is a FACT to be recorded. Explain the contrast in the writing style of journalists and historians, with appropriate examples.

## **MCJ: First Semester**

### **MCJ 1C 03: Editing for Newspapers**

#### **Module I**

Organizational structure of the editorial department - qualities and responsibilities of chief editor, assistant editor, news editor, bureau chief, special correspondents, chief sub-editors and sub-editors; editing terminology

#### **Module II**

Newsman's language - active and positive sentences; avoidance of verbosity, redundancies, clichés and monotony; transition devices; precision in vocabulary; subject and verb agreement; tenses in news writing; accuracy in punctuations, prepositions and auxiliaries

#### **Module III**

Editing process – checking facts, correcting and polishing language, rewriting leads, condensing stories, localizing news and angling news; editing for accuracy, objectivity, fairness, moral and legal propriety; translating stories from English to Malayalam and from Malayalam to English; editing handouts and news releases; handling wire copy; revising stringers' and citizen journalists' stories; stylebook consistency

#### **Module IV**

Headlines –types and functions of headlines; principles of headlining; subheads, captions and catchwords; traditional and modern headline styles;

#### **Module V**

Editorial page – editorials, opinion pieces, middles and letters to the editor; principles of editorial writing; types of editorials; qualities of and responsibilities of leader writers;

## Module VI

Newspaper layout and design – principles of artistic design – balance, contrast, proportion and unity; traditional and modern design; typography and pagination; photographs, info-graphics; design softwares

### Books for Reference

1. Bruce Westley, **News Editing**, Boston: Houghton Mifflin Company, 1972
2. Harold Evans, **Newsman's English, Handling Newspaper Text, News Headlines, Pictures on a Page, Newspaper Design** (*A Five-Volume Manual of English, Typography and Layout*) London: National Council for the Training of Journalists, 1984.
3. Floyd Baskette and Jack Sissors, **The Art of Editing**, New York: Macmillan Publishing Co, 1986
4. Jerry Lanson and Mitchell Stephens, **Writing and Reporting the News**, New York: Oxford University Press, 2008
5. Sunil Saxena, **Headline Writing**, New Delhi: Sage Publications, 2006
6. Ambrish Saxena, **Fundamentals of Reporting and Editing**, New Delhi: Kanishka Publishers, 2007
7. Carl Sessions Stepp, **Writing as Craft and Magic**, New York: Oxford University Press, 2007

### Books for Further Reading

1. T.J.S. George, **Editing: A handbook for Journalists**, New Delhi: Indian Institute of Mass Communication, 1989
2. M.L. Stein and Susan Paterno, **The News Writer's Handbook**, New Delhi: Surjeet Publications, 2003
3. George Hough, **News Writing**, New Delhi: Kanishka Publishers, 2004
4. Jan Hakemulder and Fay Jonge, **News Reporting and Editing**, New Delhi: Anmol Publications, 2002
5. Ron Smith and Loraine O'Connell, **Editing Today**, New Delhi: Surjeet Publications, 2004

6. M.K. Joseph, **Outline of Editing**, New Delhi: Anmol Publications, 2002

**I. Continuous Assessment: 15 Marks**

**1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

**2. Attendance : 4 Marks**

Allotment of marks as per University regulations.

**3. Assignment: 2.5 Marks**

Each student shall submit an editorial on a subject selected by the faculty for assessment

**4. Seminar Presentation: 2.5 Marks**

**II. End Semester Examination: 60 Marks**

**Model Question Paper**

**First Semester MCJ Degree Examination**

**MCJ 1C 03: Editing for Newspapers**

**Time: 3 Hours**

**Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following:

1. Stylebook
2. Verbosity
3. Middles
4. Objectivity
5. Moral Propriety
6. Space Saving Techniques

**II.** The headline is the reader's guide, compass and index. Explain the functions of a headline in terms of readers' utility with appropriate examples.

**III.** Newspapering is a teamwork that needs symphony and synchronization. Present the organizational structure of a newspaper, explaining the responsibilities of the key persons in the editorial department.

**IV.** The sub-editor is the unsung hero in a newspaper. Comment on this statement on the challenges and responsibilities entailed in subbing.

**V.** The editorial reflects the stand of the newspaper on a given issue and therefore, it demands an in-depth research and analysis. Explain with examples the keys to punchy editorials.

VI. Headline the Following Stories (4x 3=12 marks)

**1. CHANDIGARH:** CPI (M) general secretary Prakash Karat on Wednesday ruled out any scope of alliance with the Congress in any State during the run-up to the Lok Sabha elections, as the party was committed to ensure the defeat of the Congress as well as the BJP.

Talking to reporters on the sidelines of a meeting of the party's Punjab State Council here, Mr. Karat reiterated that the CPI(M) would be part of a non-Congress secular alliance of like-minded parties. If voted to power, the alliance would not only scrap the India-U.S. nuclear deal but also reverse a plethora of anti-people policies implemented during recent years.

**2. THIRUVANANTHAPURAM:** The Kerala Regional Committee of the Indian Newspaper Society (INS) has urged the Chief Minister V.S. Achuthanandan to make arrangements to revise government advertisement rates in view of the crisis faced by the newspaper industry owing to shortage of newsprint caused by the global meltdown.

INS also urged Electricity Minister T.K. Balan to exempt the newspaper industry from the 25 per cent curb on power supply and higher tariff rates, including thermal surcharge. In its memorandum to the Chief Minister, INS pointed out that the prices of newsprint had witnessed a 50 per cent increase in the last few months, with prices ruling at \$ 900 (Rs. 40,500) a metric tonne, excluding transportation costs, up from \$ 600 (Rs. 27,000).

**3. HYDERABAD:** Railways retained the title in the All-India inter-state senior women's cricket championship with an emphatic 10-wicket win over Maharashtra in the final at the Rajiv Gandhi Stadium here on Wednesday. Maharashtra elected to bat on a perfect batting strip but failed to make use of the opportunity and finished with a modest score of 153 for nine in 50 overs.

**4. DUBAI:** The Organisation of Petroleum Exporting Countries (OPEC) will cut daily oil production by 2 million barrels to shore up falling energy prices.

Saudi Arabia's Oil Minister Ali Naimi said on Wednesday, ahead of a crucial meeting of the grouping in Algeria, that there was a consensus among members to cut production by 2 million barrels from January 1, 2009.

## **VII. Edit and Headline Barack Obama's Speech**

If there is anyone out there who still doubts that America is a place where all things are possible, who still wonders if the dream of our founders is alive in our time, who still questions the power of our democracy, tonight is your answer. It's the answer spoken by young and old, rich and poor, Democrat and Republican, black, white, Hispanic, Asian, Native American, gay, straight, disabled and not disabled. We are, and always will be, the United States of America.

I will never forget, who this victory truly belongs to. It belongs to you. I was never the likeliest candidate for this office. This is your victory. And I know you didn't do this just to win an election. And I know you didn't do it for me. You did it because you understand the enormity of the task that lies ahead. For even as we celebrate tonight, we know the challenges that tomorrow will bring are the greatest of our lifetime \_ two wars, a planet in peril, the worst financial crisis in a century. Even as we stand here tonight, we know there are brave Americans waking up in the deserts of Iraq and the mountains of Afghanistan to risk their lives for us.

There's new energy to harness, new jobs to be created, new schools to build, and threats to meet, alliances to repair. The road ahead will be long. Our climb will be steep. We may not get there in one year or even in one term. But, America, I have never been more hopeful than I am tonight that we will get there. I promise you, we as a people will get there. There will be setbacks and false starts. There are many who won't agree with every decision or policy I make as president. And we know the government can't solve every problem.

But I will always be honest with you about the challenges we face. I will listen to you, especially when we disagree. And, above all, I will ask you to join in the work of



remaking this nation, the only way it's been done in America for 221 years \_ block by block, brick by brick, calloused hand by calloused hand.

In this country, we rise or fall as one nation, as one people. Let's resist the temptation to fall back on the same partisanship and pettiness and immaturity that has poisoned our politics for so long. Let's remember that it was a man from this state who first carried the banner of the Republican Party to the White House, a party founded on the values of self-reliance and individual liberty and national unity. And tonight, I think about all that she's seen throughout her century in America \_ the heartache and the hope; the struggle and the progress; the times we were told that we can't, and the people who pressed on with that American creed: Yes we can.

At a time when women's voices were silenced and their hopes dismissed, she lived to see them stand up and speak out and reach for the ballot. Yes we can. When there was despair in the dust bowl and depression across the land, she saw a nation conquer fear itself with a New Deal, new jobs, a new sense of common purpose. Yes we can. When the bombs fell on our harbor and tyranny threatened the world, she was there to witness a generation rise to greatness and a democracy was saved. Yes we can.

America, we have come so far. We have seen so much. But there is so much more to do. So tonight, let us ask ourselves \_ if our children should live to see the next century; if my daughters should be so lucky to live as long as Ann Nixon Cooper, what change will they see? What progress will we have made? This is our chance to answer that call. This is our moment. This is our time, to put our people back to work and open doors of opportunity for our kids; to restore prosperity and promote the cause of peace; to reclaim the American dream and reaffirm that fundamental truth, that, out of many, we are one; that while we breathe, we hope. And where we are met with cynicism and doubts and those who tell us that we can't, we will respond with that timeless creed that sums up the spirit of a people: Yes, we can. Thank you. God bless you. And may God bless the United States of America.

**(This speech carries 760 words. Edit it to a 260-word story)**

## **MCJ: First Semester**

### **MCJ 1C 04: TELEVISION PRODUCTION**

#### **Module I**

Evolution and growth of television till date – *Doordarshan*, SITE, terrestrial, cable, satellite and DTH broadcast; history of Malayalam television

#### **Module II**

Audio-visual language - framing ; Types of shots-based on size, camera movements and camera angle; composition, lighting and sound

#### **Module III**

Editing - linear and non-linear, continuity editing – insert shot- cut-in and cutaways- acceleration editing, relational editing-Montage, thematic editing and parallel cutting; transition techniques – cut, fade, dissolve, wipe and split screen; visual effects – superimposition and chroma key

#### **Module IV**

Television programme formats – serials, chat shows, reality shows, music , games, quizzes, review s- film, documentary, books, music, programmes, promos.

#### **Module V**

Studio personals – qualities and responsibilities of producer, floor manager, scene designer, costumer and makeup artist.

#### **Module VI**

Stages of production - pre-production, production and postproduction: documentary, fiction; studio productions; field productions.

#### **Module VII**

Scripting and production of commercials, PSA and music albums

### **Books For Reference**

1. Stanley J. Baran, *Introduction to Mass Communication*, McGraw Hill, 2006.
2. Vanita Kohli-Khandekar, **The Indian Media Business**, Response Books, 2006.
3. Zettl, **Television Production Handbook**, Wadsworth, 2000.
4. Ken Dancyger, **The Technique of Film and Video Editing, History, Theory, and Practice**, Focal Press, 2007.
5. Robert L. Hilliard, **Writing for Television, Radio, and New Media**, Wadsworth, 2004.
6. Arthur Asa Berger, **Scripts: Writing for Radio and Television**, Sage Publications, 1990

### **Books for Further Reading**

1. Ralph Donald and Thomas Spann, **Fundamentals of Television Production**, Surjeet Publications, 2004.
2. Anthony Friedmann, **Writing for Visual Media**, Elsevier, 2006.
3. Ivan Cury, **Directing and Producing for Television**, Focal Press, 2007.
4. Joe Nicholas, John Price and Ben Moore, **Advanced Media: Communication and Production**, Nelson, 1996.
5. Bhaskar Ghose, **Doordarshan Days**, Penguin, 2005.
6. G.C. Awsathy, **Broadcasting in India**
7. K.S. Mullick, **Tangled Tapes: The Inside Story of Indian Broadcasting**

## **I. Continuous Assessment: 15 Marks**

### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module seven.

### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations.

### **3. Shooting and Editing Assignment : 5 Marks**

## **II. End Semester Examination: 60 Marks**

**Model Question Paper**

**MCJ Degree Examination**

**MCJ 1C 04: TELEVISION PRODUCTION**

**Time: 3 Hours**

**Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following:

1. Satellite Television
2. Continuity editing
3. Chroma Key
4. Switcher
5. PSA
6. Floor Plan

**II.** Write a script for a PSA on child labour.

**III.** Differentiate between linear and non-linear editing with suitable examples of their functioning.

**IV.** Enumerate the importance of lighting in television production and explain three-point lighting.

**V.** Detail the hand-signals used by the floor manager in a television production.

**VI.** What are the major differences between single camera and multi-camera productions? Corroborate with suitable examples.

**VII.** Trace the history of television in India.

**VIII.** Comment on the new trends in television programmes.

**MCJ: Second Semester**  
**MCJ 2C 05: Media Laws and Ethics**

**Module I**

Concept of ethics - virtue ethics; potter box approach

**Module II**

Fundamental rights and freedom of speech and expression in Indian Constitution; reasonable restrictions; Emergency and censorship; self-regulation versus censorship; code of ethics for print and electronic media

**Module III**

Defamation - libel and slander and fair comment; privacy and public interest; contempt of court; contempt of parliament and breach of privilege; media and expunged proceedings of parliament; relevance of Right to Information Act in journalism

**Module IV**

Reporters and sources – trust and confidentiality; bribes, junkets and freebies; lobbying; puffery and suppression; yellow journalism and page-3 journalism; Paid news sting operation; paparazzi journalism; fakery; video piracy; plagiarism; social responsibility and accountability

**Module V**

Official Secrets Act; Copyright Act; Young Persons' (Harmful Publications) Act; Indecent Representation of Women (Prohibition) Act; Drug and Magic Remedies (Objectionable Advertisements) Act; Cinematograph Act; Information Technology Act; laws protecting intellectual property rights

**Module VI**

Working Journalists and other Newspaper Employees (Conditions of Services and Miscellaneous Provisions) Act; Working Journalists (Fixation of rates and Wages) Act; Wage Boards

**Module VII**

Provisions to restrict media under IPC, Indian Post Office Act, Customs Act, Representation of the People Act, Civil Defense Act, Protection of Civil Rights Act, Criminal Law Amendment Act and Code of Criminal Procedure

### **Books for Reference**

1. Karean Sanders, **Ethics & Journalism**, Sage Publications.
2. Naresh Rao & Suparna Naresh, **Media Laws, an appraisal**, Premier Publishing Company, Bangalore.
3. Kundra S, **Media Laws & Indian Constitution**, Anmol Publications, New Delhi
4. Vakul Sharma, **Handbook of Cyber Laws**, Macmillan
5. Nirmala Lakshman, **Writing a Nation: An Anthology of Indian Journalism**
6. Nalinin Rajan, **Practising Journalism**, Sage Publications
7. Hamid Monlana, **International Information Flow**
8. Shanti Saroop Singh, **The Press and the Indian Parliament**, Classical Publishing Company, New Delhi.

### **For Further Reading**

1. Aravind Singhal & Everett M.Rogers, **India's Communication Revolution**, Sage Publications
2. Edward S. Hrman & Noam Chomsky, **Manufacturing Consent**, Vintage
3. Dr. Jan R. Hakemuldr, **Principles & Ethics of Journalism**, Anmol Publications.
4. Patrick Lee Plaisance, **Media Ethics**, Sage Publications

## **I. Continuous Assessment: 15 Marks**

### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module seven.

### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations.

### **3. Seminar : 2.5 Marks**

### **4. Assignments : 2.5 Marks**

## **II. End Semester Examination: 60 Marks**



**Model Question Paper**  
**MCJ: Second Semester**  
**MCJ 2C 05: Media Laws and Ethics**

**Time: 3 hours**

**Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following:

- a) Potter box
- b) Puffery
- c) Plagiarism
- d) Freebies
- e) Human sentiment
- f) Categorical Imperative

**II.** What are the implications of the Official Secrets Act for a journalist?

**III.** What are the precautions to be taken while reporting linked with the defamation laws?

**IV.** Propose a comprehensive code of ethics for the media personnel.

**V.** How relevant is RTI in journalism? Explain with examples

**VI.** How can a journalist strike a balance between public interest and invasion of privacy?

**VII.** “Journalism was originally a mission. Gradually it became a profession. Today it is a business.” Comment

**VIII.** “24-hour news channels have trivialized and sensationalized news.” Substantiate.

**MCJ: Second Semester**  
**MCJ 2C 06: Magazine Journalism**

**Module I**

Origin and growth of magazines; pioneers of magazine journalism - John Dunton, Addison, Steele, Edward Cave; organizational structure of a magazine; A survey of English and Malayalam magazines

**Module II**

Types of magazines – specialized magazines - general interest and specialized magazines, public relations magazines – internal and external house organs, academic journals and Sunday magazines, e-zines, web-zines and web-edition magazines; Coffee table magazine; magazine journalism terminology

**Module III**

Qualities and responsibilities of a magazine editor; ingredients of a magazine article; editorial mix; cover story selection criteria, cover design and cover lines, and comparison of cover stories in the mainstream magazines

**Module IV**

Film reviewing, advertising, criticism and rhetoric; essential elements of a film review – condensed plot synopsis, background information, abbreviated arguments about the film and evaluation; book reviewing – pre-reading, reading and post-reading procedures, writing format and principles of book reviewing, art of reviewing: food, fashion, cosmetics and costumes

**Module V**

Feature versus news story, feature versus article, feature structure, feature headlines, feature leads, classification of features and steps in writing feature

**Module VI**

Profile versus biography and profile requisites; writing columns; preparing photo features; writing for specialized magazines; current trends and challenges in magazine journalism-narrative journalism

**Module VII**

Magazine design and layout, photographs, illustrations, info-graphics, typography and white space; magazine design softwares

### Books for Reference

1. John Morrish, **Magazine Editing**, Routledge, 1996
2. Linda McLoughlin, **The Language of Magazines**, Routledge, 2001
3. Michelle Ruberg, **Handbook of Magazine Article Writing**, Writer's Digest, 2005
4. Antony Davis & Heinemann, **Magazine Journalism Today**, Professional Publishing, 1988
5. East R. Hutchison, **The Art of Feature Writing**, Oxford University Press, 2008
6. David E. Sumner & Holly G. Miller, **Feature and Magazine Writing**, Surjeeth Publications, 2006
7. Benton Rain Patterson & Coleman E. P. Patterson, **The Editor in Chief**, Surjeeth Publications, 2005
8. Jenny Mckay, **The Magazine Handbook**, Routledge, 2000

### Books for Further Reading

1. Humed Contractor, **The Art of Feature Writing** , Icon Publications, 2004
2. Steephan G. Bloom, **Inside the Writer's Mind**, Surjeeth Publications, 2004
3. Jill Dick, **Writing for Magazines**, Unistar Books, 2004
4. Edward Jay & John Lee, **Feature Writing for Newspapers and Magazines**, Harper and Row Publishers, 1988
5. Paul Nelson, **Articles and Features** , Houghton Mifflin Company, 1978
6. Louis Alexander, **Beyond the Facts**, Surjeeth Publications, 2003
7. Theodore Peterson, **Magazines in the Twentieth Century**, University of Illinois, 1956

## **I. Continuous Assessment: 15 Marks**

### **1. Class Tests**

**:6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module seven.

### **2. Attendance**

**: 4 Marks**

Allotment of marks as per University regulations.

### **3. Seminar and Assignments**

**: 5 Marks**

Each student shall make a critical analysis of a magazine and make a presentation. The paper should be submitted for valuation.

## **II. End Semester Examination: 60 Marks**

**Model Question Paper**

**MCJ Degree Examination**

**MCJ 2C 06: Magazine Journalism**

**Time: 3 Hours**

**Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I** Write short notes on any four of the following.

1. E-zines
2. Freebies
3. TOT
4. Typography
5. White Space
6. Pull-quote

**II.** “A magazine’s success is in its cover, cover lines and cover story.” Substantiate.

**III.** “A feature is an unperishable commodity that no reader can miss.” Elucidate the recipe for a feature with suitable examples.

**IV.** “A magazine editor’s role is like that of a conductor in a concert.” Elaborate on the Herculean task of manning a magazine.

**V.** “With the onslaught of television news channels, television is today what newspaper was yesterday, newspaper is today what magazine was yesterday, and magazine is today what tabloid was yesterday.” Comment on the current trends and survival tactics in the magazine industry today.

**VI.** “A film review is basically a critique, arousing curiosity but sustaining suspense.” Explain with an appropriate example .

**VII.** “A profile is a life-sketch but not a chronological biography; it is like a garland intertwined with twists and emotional roller coasters.” Explicate with examples.

## **MCJ: Second Semester**

### **MCJ 2C 07: Communication Theories**

#### **Module I**

Concept of theory; four approaches to theory – media-culturalist, media-materialist, social-culturalist and social materialist; four kinds of theory – social-scientific, normative, operational and everyday/commonsense theory

#### **Module II**

Theory of objectivity; mass society theory; information society theory; cultivation theory; agenda setting theory; spiral of silence theory; theory of cultural imperialism and cultural autonomy

#### **Module III**

Four dimensional perspective on media effects – timing of effects- immediate and long term, type of effects – cognitive, attitudinal emotional, physiological and behavioural ; media influence on family; impact of media on children; media literacy

#### **Module IV**

Four phases of mass communication effects theories – “almighty media”, testing the might of the media, return to ‘almighty media’ and “social constructivist” media influence

#### **Module V**

Contemporary theories of mass communication - individual differences theory, social categories theory, social relationships theory and cultural norms theory

#### **Module VI**

Media ownership – chain, cross media, conglomerate and vertical integration; media mega mergers; media and cultural imperialism

#### **Module VII**

Theories of learning; persuasive communication variables; cognitive dissonance theory, congruity theory and balance theory; information diffusion theory; gate-keeping theory; two-step flow and multi-step flow theories ; feminist media theory.

#### **Module VIII**

Media and political communication theories – pluralist model, dominant-ideology model, elite-values model and market model; media as custodians of democracy; mass media and governance; media and globalization; mass media as propaganda machines; politics of spin

## Books for Reference

1. Stanley J. Baran & Dennis K Davis, **Mass Communication Theory: Foundations, Ferment, and Future**, Thomson & Wadsworth
2. Gerald Stone, **Clarifying Communication Theory**, Surjeet Publications
3. Denis McQuail, **McQuail's Mass Communication Theory**, Sage Publications
4. Denis McQuail, **McQuail's Reader in Mass Communication Theory**, Sage Publications
5. Bettinghus E P, **Persuasive Communication**
6. Melvin I. DeFleur, **Theories of Mass Communication**, David McKay Company
7. J.V. Vilanilam, **Mass Communication: Theory and Practice**, Makhanlal Chaturvedi Rashtriya Patrakarita Viswavidyalaya, Bhopal
8. Srinivas R. Melkote & Sandhya Rao, **Critical Issues in Mass Communication**, Sage Publications
9. W. James Potter, **Media Literacy**, Sage Publications

### **I. Continuous Assessment: 15 Marks**

|                       |                 |
|-----------------------|-----------------|
| <b>1. Class Tests</b> | <b>:6 Marks</b> |
|-----------------------|-----------------|

There shall be two internal examinations within the semester: one, at the completion of module five and the second, at the completion of module eight.

|                      |                  |
|----------------------|------------------|
| <b>2. Attendance</b> | <b>: 4 Marks</b> |
|----------------------|------------------|

Allotment of marks as per University regulations.

|                   |                   |
|-------------------|-------------------|
| <b>3. Seminar</b> | <b>:2.5 Marks</b> |
|-------------------|-------------------|

|                       |                   |
|-----------------------|-------------------|
| <b>4. Assignments</b> | <b>:2.5 Marks</b> |
|-----------------------|-------------------|

### **II. End Semester Examination: 60 Marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 2C 07: Communication Theories**

**Time: 3 Hours**

**Max. Marks: 60**

Answer question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following:

1. Culture jamming
2. Convergence
3. Information Society
4. Streaming
5. Spin
6. Digital divide

**II.** ‘Mass media have a uniform and direct effect on the society.’ Examine the validity of this theory, with a postmortem of the various media impact studies.

**III.** Examine the implications inherent in the cognitive dissonance theory for a communicator.

**IV.** The ethnic, religious and cultural conflicts in the world have their roots in ethnocentrism. Examine the relevance of intercultural communication competence in the ‘global village’.

**V.** Information or innovation diffusion pattern changes with the advancement of technology. Substantiate it with scientific studies in the area.

**VI.** ‘Media is the fourth estate.’ Examine Edmund Burke’s statement making an assessment of the performance of the media in a democracy.

**VII.** What are the key factors of persuasive communication?



## **MCJ: Second Semester**

### **MCJ 2C 08: RADIO PRODUCTION**

#### **Module I**

History of radio – Maxwell, Hertz, Marconi, Nicolas Tesla, Jagdish Chandra Bose, Lee De Forest, Charles Fesenden and others; radio as a military/naval communication instrument; radio becomes part of mass media; growth of radio up to 1950s; advent of television; revival of radio in the fragmented post-modern society ,Private FM & community radio. History of radio in India from 1921- Indian radio and colonial legacy; radio in the post-independence era

#### **Module II**

Radio station- objectives, policies and ethics. `Radio with commercial interests; radio and popular culture; radio’s role in disaster management

#### **Module III**

Radio news – local, regional, national, and global news; scripting for radio news; news personnel and the organizational structure; language and style of news bulletins; news magazines; news flashes; structure of a news bulletin; voice cast

#### **Module IV**

Written and spoken language for broadcast; role of written script; live presentation; local slang and ‘standard’ language in broadcasting; voice modulation techniques; intimacy; formal and informal presentation; narrowcasting and presentation styles; RJs, DJs and radio hosts

#### **Module V**

Radio formats - music in radio; art of interviewing; radio play as ‘Minds’ Theatre’; creation of radio persona in chat shows; stock characters, Special audience programme- women, agricultural/farm, youth and children, radio magazine

#### **Module VI**

Commercials - making commercials, revenue generation, audience research, customised programmes, brand building of radio, publicity of programmes and radio channels, audience response, selling of radio personality, sources of advertisement, marketing techniques, creation of advertisements and jingles

#### **Module VII**

The technical side of broadcast - the physics of sound generation; Transmission methods- AM, FM, SW; Digital sound formats- MP2, MP3, WAV

### Books for Reference

1. Stanley J. Baran, **Introduction to Mass Communication**, McGraw Hill
2. Robert McLeish, **Radio Production**, Focal Press
3. Vanita Kohli-Khandekar, **The Indian Media Business**, Response Books

### Books for Further Reading

1. Paul Chantler and Peter Stewart, **Basic Radio Journalism**. Focal Press
2. U. L. Baruah, **This is All India Radio**.
3. Andrew Boyd, **Broadcast Journalism, Techniques of Radio and Television News**
4. Esta De Fossard, **Writing and Producing Radio Dramas**, Sage Publications
5. K. Tim Wulfemeyer, **Beginning Radio–TV News Writing**, Surjeet Publications
6. K. Tim Wulfemeyer, **Radio–TV News Writing Workbook**, Surjeet Publications
7. Carl Hausman, Philip Benoit and Lewis Donnell, **Modern Radio Production, Programming and Performance**
8. Robert L. Hilliard, **Writing for Television, Radio, and New Media**, Wadsworth
9. **Encyclopaedia of Broadcasting: Television and Radio, Vol. I, II & III**
10. G.P.S. Nair, *Radio Smaranakal*
11. Thikkodiyar, *Arangu Kanatha Natan*
12. *P. Bhaskarante Jeevithavum Kalayum*
13. K. A. Beena, *Radio: Kalayum Kathayum*

## **I. Continuous Assessment: 15 Marks**

### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module seven.

### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations.

### **3. Assignments : 2.5 Marks**

### **4. Seminar : 2.5 Marks**

## **II. End Semester Examination: 60 Marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 2C 08: RADIO PRODUCTION**

**Time: 3 Hours**

**Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following.

1. Radio, the universal medium
2. RJs
3. F M radios
4. Community radio
5. Phone-outs
6. Running commentaries

**II.** Elaborate the role of radio in disaster management with examples.

**III.** Is radio a momentary medium? Discuss the effectiveness of communication through radio in Kerala

**IV.** Write a news script for the morning bulletin on *Thiruvonum* (Hints: Govt. withdraws load shedding, Onam markets to be extended up to Christmas, President to visit Kerala in October, 60 suspected killed in a plane crash in US). ..

**V.** Suggest five new radio formats, with title and target audience.

**VI.** Make a comparative analysis of the presentation techniques of private FM channels and AIR's medium wave channels.

**VII.** Discuss the plus and minus points of the proposal to grant news bulletins on private FM stations.

**VIII.** Is state-funding of public service broadcasters required in India in the changing scenario? Elaborate.

## **MCJ: Third Semester**

### **MCJ 3C 09: Public Relations and Corporate Communication**

#### **Module I**

Definition of public relations; evolution of public relations; history of PR in India; scope and functions of public relations; PR and propaganda; PR and corporate advertising; publicity and public relations.

#### **Module II**

Organizational set-up of public relations departments/agencies; public relations in private and public sectors; Central and State Government public relations departments; PR campaign; PR tools; Government media units and their functions; Role and responsibility of PRO

#### **Module III**

Public relations and spin doctoring, PR professionals and political image management, lobbying, packaging, merchandising, customer care, e-marketing, crisis resolution and communication

#### **Module IV**

PR and media relations – issuing news releases, holding briefings and news conferences, organizing facility visits, sponsorship and exhibitions, producing newsletters, house journals and brochures, new media, PR and public, trade union relations, customer relations, employee relations, community relations, and stockholder relations

#### **Module V**

Corporate Communication- definition, Corporate identity and corporate image; corporate culture and corporate citizenship; functions of corporate communicator, corporate social responsibility; public relations and corporate community involvement; public relations and corporate reputation

#### **Module VI**

PR professional organizations; PR code of ethics

### Books for Reference

1. Joseph Fernandez, **Corporate Communications: A 21<sup>st</sup> Century Primer**, Response
2. Philip Kitchen & Don Schultz, **Raising the corporate umbrella: Corporate communications in the 21st Century**, Palgrave.
3. Sumantra Ghoshal, **World Class in India**, Penguin
4. Philip Lesly, **Handbook of Public Relations & Communications**, Jaico
5. Jaishri Jethwaney, **Public Relations: Concepts, Strategies and Tools**, Sterling
6. Sam Black, **Practical Public Relations**, Universal Books
7. C.S. Rayadu & K. R. Balan, **Principles of Public Relations**, Himalaya Publishing House
8. Alison Theaker, **The Public Relations Handbook**, Routledge
9. G.C. Banik, **PR& Media Relations**, Jaico
10. P. R. Smith, **Marketing Communications**, Kogman Page India

### Books for Further Reading

1. Anil Basu, **Public Relations: Problems & Prospects with Case Studies**, Image Publications
2. CEOs of leading PR Firms, **The Art of Public Relations**, Vision Books.
3. B.N.Ahuja & S.S. Chhabra, **Advertising & Public Relations**, Surjeet Publications
4. Scott.M. Cutlip & Allen H.Center, **Effective Public Relations**, Prentice Hall
5. **India Business Yearbook**, Vikas Publications

## **I. Continuous Assessment: 15 Marks**

### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations.

### **3. Seminar : 2.5 Marks**

### **4. Assignments : 2.5 Marks**

## **II. End Semester Examination: 60 Marks**

**Model Question Paper**

**MCJ Degree Examination**

**MCJ 3C 09: Public Relations and Corporate Communication**

**Time: 3 Hours**

**Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I. Write short notes on any four of the following:**

1. Grapevine
2. E-marketing
3. Lobbying
4. Institutional advertising
5. Muckrakers
6. Open House

**II.** Differentiate between PR, advertising, publicity and propaganda.

**III.** What is the role of corporate communication in the image building of an organization?

**IV.** Public relations is today defined as “the deliberate management of public image and information in pursuit of organizational interests.” Discuss.

**V.** Describe the organizational set-up of a PR department in the public sector and the function of its PR personnel.

**VI.** How does public relations influence public opinion? Discuss some of the ethical issues involved while executing PR campaigns.

**VII.** Assess the role of PR in crisis management.



**MCJ: Third Semester**  
**MCJ 3C 10: Advertising**

**Module I**

History and evolution of advertising; defining modern advertising; key concepts of advertising; roles and functions of advertising – marketing, communication, economic, social; key players - advertiser, advertising agency, media, suppliers and target audience; types of advertising

**Module II**

Consumer Behavior – cultural, social, psychological and behavioral influences; consumer decision process; segmenting, targeting and positioning; branding

**Module III**

Advertisement copywriting for print – copywriter and advertising writing style, writing headlines, display copy and body copy, illustrations and photos, typography and design; Tools of copy writing-radio, television, web; planning and production of television commercials

**Module IV**

Potentials and limitations of different media in advertising; Media planning and buying – the aperture concept, media plan – media research, media objectives, media strategies and media buying; art and science of creative advertising and facets of creative strategy

**Module V**

Evaluation of advertising effectiveness – types and stages of evaluation, copy testing, media evaluation – audience exposure, and advertising ROI and media efficiency

**Module VI**

Advertising ethics – poor taste and offensive advertising, reinforcing stereotypes, body image and self-image, targeting children, misleading claims and other message strategies, advertising controversial products; professional organizations

**Books for Reference**

1. S.A Chunnawalla, **Advertising: An Introductory Text**, Himalaya Publishing House
2. Subrata Banerjee, **Advertising as a Career**, National Book Trust
3. J.V. Vilanilam and A. K. Varghese, **Advertising Basics: A Resource Guide for Beginners**, Sage Publications
4. Wells, Moriarty and Burnett, **Advertising: Principles and Practice**, Pearson Education

### **Books for Further Reading**

1. George Belch, **Advertising and Promotion**, Tata McGraw-Hill
2. S.H.H. Kazmi and Satish Batra, **Advertising and Sales Promotion**, Excel Books
3. S.N. Murthy and Ubhojana, **Advertising: An IMC Perspective**
4. Littlefield and Kirkpatrick, **Advertising, Mass Communication and Marketing**
5. Otto Kleppner, **Advertising Procedures**
6. Sandage and Frybeger, **Advertising Theory and Practice**
7. Roger Barton, **Handbook of Advertising**

### **I. Continuous Assessment: 15 Marks**

#### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

#### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations.

#### **3. Seminar :2.5 Marks**

#### **4. Assignments :2.5 Marks**

### **III. End Semester Examination: 60 Marks**

**Model Question Paper**  
**MCJ Degree Examination**  
**MCJ 3C 10: Advertising**

**Time: 3 Hours**

**Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following.

1. Niche market
2. Yellow pages
3. Guerilla marketing
4. Off-line advertising
5. Media aperture
6. Jingles

**II.** Discuss the roles and functions of advertising within society and business.

**III.** Critique the key ethical issues that challenge the practice of advertising.

**IV.** Describe how the consumer decision process works.

**V.** Explain the key concepts of media planning and buying

**VI.** Explain the basic stylistics of advertising copy

**VII.** What are the ethical issues in advertising?

**VIII.** Prepare a print ad for a new English magazine to be launched shortly.

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## **MCJ: Third Semester**

### **MCJ 3C 11: Mass Communication Research**

#### **Module I**

Nature and scope of research; development of mass media research; an evaluation of communication research in India, media research and scientific method; methods of knowing; characteristics of scientific method; academic and applied research

#### **Module II**

Research procedures – determining topic relevance, review of literature, hypothesis formulation, conceptualization and theory building, research design, sampling techniques, data collection, statistical tests, data analysis and interpretation, research reporting, conclusions and recommendations; statistical packages for data analysis (SPSS)

#### **Module III**

Elements of research – concepts and constructs, variables and measurements, reliability and validity; sampling – probability and non-probability samples, sample size and sample error

#### **Module IV**

Qualitative research methods – field observations, focus groups, intensive, interviews and case studies; content analysis – uses and limitations, steps, examples, reliability and validity

#### **Module V**

Survey research – descriptive and analytical surveys, advantages and disadvantages, constructing questions, questionnaire design, pre-testing, data collection and analysis; longitudinal research – development and types of longitudinal studies; experimental research – advantages and disadvantages of laboratory experiments, conducting experimental research, experimental design and field experiments

#### **Module VI**

Measures of central tendencies – computation of mean, median and mode; measures of dispersion- range, mean deviation, standard deviation; measures of variance; skewness and correlation tests – chi-square, f-test, t-test and ANOVA

#### **Module VII**

Thesis style(APA) – bibliography, indexing, abstracting, reference, citation, appendix and manuscript preparation

#### **Books for Reference**

1. Roger D. Wimmer & Joseph R. Dominick, **Mass Media Research**, Thomson

2. Barrie Gunter, **Media Research Methods**, Sage
3. Arthur Asa Berger, **Media Research Methods**, Sage
4. John Adams, **Research Methods for Graduate Business and Social Science Students**, Response
5. Arthur Asa Berger, **Media and Communication Research Methods**, Sage
6. Anders Hansen et al., **Mass Communication Research Methods**, Macmillan
7. Gerianne Merrigan & Carol Logan Huston, **Communication Research Methods**, Thomson

### Books for Further Reading

1. Klaus Krippen Dorff, **Content Analysis: An Introduction to its Methodology**, Sage
2. Susanna Horning Priest, **Doing Media Research: An Introduction**, Sage
3. David Dooley, **Social Research Methods**, Prentice Hall

## **I. Continuous Assessment: 15 Marks**

### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module seven.

### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations.

### **3. Seminar : 2.5 Marks**

### **4. Assignments : 2.5 Marks**

## **II. End Semester Examination: 60 Marks**

**Model Question Paper**

**MCJ Degree Examination**

**MCJ 3C 11: Mass Communication Research**

**Time: 3 Hours**

**Max. Marks: 60**

Answer question I and FOUR others. All questions carry equal marks

**I.** Write short notes on any four of the following:

1. Likert Scale
2. T-test
3. Independent variable
4. Snowball sampling technique
5. Standard deviation
6. Normal curve

**II.** What are experiments? Differentiate between laboratory experiments and field experiments.

**III.** Define probability sampling and explain three most commonly used probability sampling methods.

**IV.** Define content analysis. Explain the steps involved in analyzing development news in two Malayalam dailies of your choice.

**V.** Prepare a questionnaire to collect data on college students' demographic variables and their TV viewing habits with special reference to Malayalam TV. Channels. The items in

the questionnaire should be structured to assess the popularity of the channels as well as the popularity of the programmes broadcast by the channels.

**VI.** Explain the salient features of nominal, ordinal and interval data in communication research.

**VII.** Evaluate the status of communication research in India.

**VIII.** Find the standard deviation for the following frequency distribution of scores:

| <b>Class Interval</b> | <b>f</b> |
|-----------------------|----------|
| 17 – 19               | 1        |
| 14 – 16               | 2        |
| 11 – 13               | 3        |
| 8 – 10                | 5        |
| 5 – 7                 | 4        |
| 2 - 4                 | 2        |

## **MCJ: Third Semester**

### **MCJ 3C 12: Television Journalism**

#### **Module I**

Organizational structure of a television news channel; bureau and desk operation; television news terminology

#### **Module II**

Television reporting – qualities and responsibilities of a television reporter; news formats - O-C, O-C VO, O-C VO SOT, O-C Graphics, O-C SOT, O-C Live, O-C Phono and O-C Package; ENG and DSNG; Piece To Camera (PTC) – stand-up, stand-up close, stand-up open and signature line, Live news reporting – straight-up live, live with interview, live with SOT, live with VO, live with VOSOT and live with package; breaking news; techniques of live telecast

#### **Module III**

Television news structure –headlines, teaser and teller leads, body and tag; subbing reporters', news agency and citizen journalists' copies; writing voice-over; studio package; rundown preparation TV news language, ingredients of TV newscast

#### **Module IV**

Production Control Room (PCR) operation; role and responsibilities of producer, news editor, assignment editor, visual editor and graphics editor

#### **Module V**

Television interviews – opinion interview, information interview, news interview, filed interview, vox pop and personality interview, interviewing techniques; panel discussion, News based programmes-debates, satirical programmes etc..

#### **Module VI**

Television news anchoring; qualities of a news anchor; aesthetics of presentation – speed, breath, gesture, posture, facial expressions, pitch, pace, pause and duration

#### **Module VII**

Scoops and exclusives; New media tools and news breaking; sting operation – legal and ethical issues; critical analysis of leading English and Malayalam news channels; current trends and challenges



### **Books for Reference**

1. Ivor Yorke, **Television News**, Focal Press
2. Zettl, **Television Production Handbook**, Wadsworth
3. Andrew Boyd, **Broadcast Journalism, Techniques of Radio and Television News**, Focal Press
4. Ted White, **Broadcast News Writing, Reporting and Production**
5. Gerald Millerson, **Effective TV Production**
6. Browssard and Holgate, **Broadcast News**
7. Fletcher, **Professional Broadcasting**

### **Books for Further Reading**

1. Eric K. Gormly, **Writing and Producing Television News**, Surjeet Publications
2. Robert L. Hilliard, **Writing for Television, Radio, and New Media**, Wadsworth, 2004
3. Rick Thompson, **Writing for Broadcast Journalism**, Routledge.

## **I. Continuous Assessment: 15 Marks**

### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module seven.

**2. Attendance : 4 Marks**

Allotment of marks as per University regulations

**3. Interview Assignment : 5 Marks**

Students divided into teams of four members each, shall produce a 20-minute personality interview and submit for valuation.

**II. End Semester Examination: 60 Marks**

**Model Question Paper**

**III Semester MCJ Degree Examination**

**MCJ 3C 12: Television Journalism**

**Time: 3 Hours**

**Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following.

1. Breaker
2. Bump
3. Evergreen
4. Rundown
5. PTC
6. TRP

**II.** Explain the various steps involved in a television interview.

**III.** Discuss the role of a television reporter in the current scenario

**IV.** Prepare a 20-minute television news bulletin in the split-page format using current events

**V.** Explain the traits of a successful news anchor

**VI.** Compare any two national television news channels and assess their role in Indian democracy.

**VII.** Elucidate the challenges of reporting live news

**VIII.** “With the onslaught of 24-hour television news channels, events are either sensationalized or trivialized.” Comment.

**MCJ: Fourth Semester**  
**MCJ 4C 13 : Introduction to Cinema**

**Module I**

Lumiere Brothers, the era of silent movies, evolution of sound films and major cinema movements - German expressionism, Soviet montage, Italian neo-realism and 'French New Wave'; Hollywood cinema, Japanese cinema; Indian new wave cinema; Current trends: in Latin American, South Korean, and Iranian cinema.

**Module II**

Film genres – romantic comedies, romantic drama, cops and robbers, gangsters, sci-fi fantasy, detective, funny, spoofs, thrillers, horror, religious, suspense, courtroom, musicals, history, epics, war and others.

**Module III**

Film terminology; characteristics, potentials and limitations of cinema; types of films - feature films, documentaries, short films, animations and others; art versus commercial cinema;

**Module IV**

Film direction – qualities and responsibilities of a film director, world's great directors; acting – challenges and responsibilities, world's great actors.

Scripting for short films and documentaries - format, scripting steps, storyboarding, shooting script and script breakdown.

**Module V**

Brief history of documentary; characteristics and functions of documentary; Types: cinema direct, cinema verite, interactive documentary, observational documentary, expository documentary, and reflexive documentary.

**Module VI**

Shooting - camera as storyteller, composition of shot; Types of shot- size of shots; camera movements; camera angle; continuity; lighting. Production management in cinema-shooting schedule, budgeting, casting, sets, props, wardrobe and makeup; location management.

Visual editing - editing techniques and transition devices; sound editing – spotting, on-screen sounds, ambient sounds, off-screen sounds, synchronous and asynchronous sound, background and foreground music, dialogue tracks, sound effects, music tracks and re-recording

## Movies For Viewing And Analysis

### Movies by Lumiere Brothers:

Arrival of a Train

Gardener with a watering hose

Workers Leaving the Factory

Demolition of a wall

Breakfast scene

### **Other Movies**

1. A Trip to Moon by George Melies
2. The Birth of a Nation by D.W. Griffith
3. The Cabinet of Dr. Caligari by Robert Wiene
4. Battleship Potemkin by Sergei M. Eisenstein
5. Modern Times by Charles Chaplin
6. The Grand Illusion by Jean Renoir
7. Citizen Kane by Orson Welles
8. Bicycle Thieves by Vittorio De Sica
9. Rashomon by Akira Kurosawa
10. Roman Holiday by William Wyler.
11. Pather Panchali by Satyajit Ray
12. Wild Strawberries by Ingmar Bergman.
13. The Godfather by Francis Ford Coppola.
14. Pyaasa by Guru Dutt.
15. Hiroshima, mon amour by Alain Resnais.
16. Breathless by Jean-Luc Godard.
17. Knife in the Water by Roman Polanski.
18. Bhuvan Shome by Mrinal Sen.

19. Jules and Jim by François Truffaut.
20. Ankur by Shyam Benegal.
21. One who flew over the Cuckoo's Nest by Milos Forman.
22. Elipathayam by Adoor Gopalakrishnan.
23. Nayakan by Mani Ratnam.
24. Amma Ariyaan by John Abraham.
25. Piravi by Shaji N. Karun.
26. Through the Olive Trees by Abbas Kiarostami.
27. Postino by Michael Radford.
28. The Cyclist by Mohsen Makhmalbaf.
29. Gulabi Talkies by Girish Kasaravalli.
30. Spring, Summer, Fall, Winter... and Spring by Kim Ki-duk.
31. Veedu by Balu Mahendra.
32. Run Lola Run by Tom Tykwer.
33. The Day I Became a Woman by Marziah Meshkini.
34. Thoovanathumbikal by P Padmarajan.
35. Traffic by Rajesh Pillai.

### **Documentaries for Viewing and Analysis:**

1. **Born into Brothels**, directed by Ross Kauffman and Zana Briski.
2. **Bowling for Columbine**, directed by Michael Moore.
3. **Fahrenheit 9/11**, directed by Michael Moore.
4. **The Fog of War**, directed by Errol Morris.
5. **March of the Penguins**, directed by Luc Jacquet.
6. **The Man with the Movie Camera**, directed by Dziga Vertov.
7. **Ram Ke Naam**, directed by Anand Patwardhan.
8. **Bombay Our City**, directed by Anand Patwardhan.
9. **Hey Ram!! Genocide in the Land of Gandhi**, directed by Gopal Menon.
10. **The Fire Within**, directed by Shri Prakash.

11. **PAPA 2**, directed by Gopal Menon.
12. **Have you seen the arana?** (Ningal aranaye kando?), directed by Sunanda Bhat.
13. **Salesmen**
14. **Glass**
15. **Zoo**

### Books for Reference

1. Bernard F Dick, **Anatomy of Film**, St. Martin Press, New York, 1978
2. John Russo, **Making Movies**, Dell Trade, 1989.
3. Susan Hayward, **Key concept in Cinema studies**, Routledge, 2004.
4. Louis Giannetti, **Understanding Movies**, Simon and Schuster Company, USA
5. Nathan Abrlams, Ian Bell and Jan Udris, **Studying Film**
6. J. Dudley Andrew, **Major Film Theories: An Introduction.**
7. Tom Holden, **Film Making**
8. Brain Brown, **Cinematography: Theory and Practice.**
9. Stanley J. Baran, **Introduction to Mass Communication**
10. Keval J. Kumar, **Mass Communication in India'**, Jaico Publishing House
11. Anwar Huda, **The Art and Science of Cinema**, Atlantic Publishers
12. H.N. Narahari Rao, **The most Memorable Films of the World**, Prism Books
13. Sheila Curran Bernard, **Documentary Storytelling**, Focal Press, 2007.
14. Jag Mohan, **Documentary Films and Indian Awakening**, Publications Division, Films Division, 1990.
15. Michael Rabiger, **Directing the Documentary**, Focal Press.
16. Arthur Asa Berger, **Script Writing for Radio and Television**, Sage Publications.

### Books for Further Reading

1. James Monaco, **How to Read a Film**, Oxford University Press, 2000.
2. Nick Lacey, **Introduction to Film**, Palgrave Macmillan, 2005.

3. Shohini Chaudhuri, **Contemporary World Cinema**, Edinburgh University Press, 2005.
4. Yves Thoraval, **The Cinemas of India**, Macmillan, 2000.
5. David K. Irving and Peter W. Rea, **Producing and Directing the Short Film and Video**, Focal Press, 2006.
6. Mike Wolverton, **Reality on Reels: How to Make Documentaries for Video/Radio/Film**, Surjeet Publications, 2005.
7. Rajiv Mehrotra, **The Open Frame Reader: Unreeling the Documentary Film**

## **I. Continuous Assessment: 15 Marks**

### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations

### **3. Film Analysis : 5 Marks**

Each student shall make a critical study of a celebrated filmmaker and make a power-point presentation.

## **II. End Semester Examination: 60 Marks**



**Model Question Paper**

**MCJ Degree Examination**

**MCJ 4C 13: Introduction to Cinema**

**Time: 3 Hours**

**Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following.

1. Mise-en-scene
2. Expressionism
3. Avant-garde
4. Classical cutting
5. Montage
6. Cinema verite

**II.** Compare and discuss ‘Born into Brothels’ and ‘Bombay Our City.’

**III.** What is docudrama and how does it differ from other forms of documentary?

**IV.** Prepare a proposal for a documentary film with all the required stages of documentary filmmaking on any one of the following topics:

1. Kuttanad: The Rice Bowl of India
2. A Self-help Group in Kerala

**V.** Comment on the father of documentary, elucidating his contributions.

**VI.** Analyse and compare any two movies / documentaries of a director of your choice.

**VII.** Trace the history of Malayalam cinema, with its ups and downs. .

**VIII.** Explain the differences between the production process of documentaries and short films.

## **MCJ: Fourth Semester**

### **MCJ 4C 14: NEW MEDIA AND ONLINE JOURNALISM**

#### **Module I**

Basics of Internet; History of Internet, how Internet works — the web and the file transfer — Usenet and news groups — Researching via Internet — emerging trends.

#### **Module II**

Electronic Environment; News gathering, processing, visual storytelling, news content in online environment, Journalism via Internet.

#### **Module III**

Online Journalism; The rise of online news, breaking news — scoops- facts and fakes — immediacy, depth and interactivity, confirming authenticity; emerging trends; online newsgathering.

#### **Module IV**

Online reporting-writing style and packaging for online news; Crisis and scandals, redefining news, alternative perspectives, truth, objectivity and fairness — cases studies, emerging trends in online reporting.

#### **Module V**

Participatory and Citizen Journalism; Reporting in the liberalized era - People's news source, news on demand, digital citizens; communicating crisis.

#### **Module VI**

New Media: legal and ethical communications; Origin and development of new media, crossing thresholds, communities of interest, trends.

Ethical issues in online journalism - copyright issues, regulating online practices, plagiarism; IT Act 2000.

### **Books for reference**

1. Allan, Stuart : Online News
2. Bakardjieva, Maria : Internet Society
3. Jagdish, Chakravarthy : Cyber Media Journalism, Emerging Technologies
4. Jones G Steven : Cyber Society
5. Whitaker, Jason : The Internet, The Basics

## **I. Continuous Assessment: 15 Marks**

### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six

### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations

### **3. Seminar : 2.5 Marks**

### **4. Assignments : 2.5 Marks**

## **II. End Semester Examination: 60 Marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 4C 14: New Media and Online Journalism**

**Time: 3 Hours**

**Max. Marks: 60**

Answer question I and FOUR Others. All questions carry equal marks

**I.** Write short notes on any four of the following

1. Information Highway
2. E-newspapers
3. E-zine
4. WhatsApp
5. Blog writing
6. Ethical Hacker

**II** Explain the advantages and disadvantages of Web Journalism

**III** Explain relevance of Internet in Print, Broadcast Media and Films

**IV** Duties and responsibilities of On-line Editors'

**V** Illustrate Web radio and Web TV

**VI** Explain digital divide

**VII** what are the challenges faced by online journalism in India?

**VIII** what is Participatory Journalism? Explain with suitable examples

# ELECTIVE PAPERS

## **Second Semester: Elective Course**

### **MCJ 2E 01: PHOTO JOURNALISM**

#### **Module I**

Evolution of photography- history and development, Types of Cameras- Single Lens Reflex (SLR), Twin Lens Reflex (TLR), Rangefinder Cameras, View Cameras, Polaroid Cameras, Super wide-Angle Camera, Panoramic Camera, Aerial Camera, Sub-miniature Camera; Digital Photography.

#### **Module II**

Lenses- focal length, Focus and Magnification; Lenses of normal, short and long focal length; convertible, enlarging, perspective, supplementary, zoom and Macro lenses; Lenses and Composition- Aperture Settings, Shutter Speed and Depth of field

#### **Module III**

Visualization of A Photograph- Characteristics of A Photograph, Composition, Point of View, Framing, Horizontal and Vertical Format, Centre of Interest, Horizontal Line, Near-Far Relationship, Time of Day And Decisive Moment; Lighting-Front, Side, Back And Revealing Lights; Shooting in Artificial and Mixed Light

#### **Module IV**

Scope and Significance of Photojournalism, News Photographs, Advertisements Photographs, Wild Life Photographs, Sports Photographs; Review of Photography Magazine; Leading Photojournalists in India; International Photojournalists; Ethics in Photo Journalism; Paparazzi Journalism; Photo Essay; Freelance Photography.

#### **Module V**

Editing Photographs- Transferring Photographs to a personal Computer; Photo Selection, Cropping, Scaling and Toning; Photo Editing Software

## **Books for Reference:**

- Arthur Rostein : Photo Journalism
- B K Deshpandey : Photo Journalism
- Huy : Photo Journalism (the visual approach)
- Jonathan Hilton : Action photography
- Lewis : Photo journalism: Content and technique
- Lizwells : The photography reader
- Loup langton : Photo journalism and today's news
- Rick Samon's : Complete guide to Digital photography
- Salomon : Advertising photography
- Scharf : Pioneers of photography
- Steve Bavister : Digital photography
- Walden : Photography and Philosophy

## **I. Continuous Assessment: 15 Marks**

### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations

### **3. Seminar : 2.5 Marks**

### **4. Assignments : 2.5 Marks**

## **II. End Semester Examination: 60 Marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 2E 01: Photo Journalism**

**Time: 3 Hours**

**Total Marks: 60**

Answer question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following.

1. Portraits
2. Shutter speed
3. Filters
4. Depth-of-field
5. Colour balance
6. Rule of the Thirds

**II.** Trace the history of photo journalism

**III.** What are the salient features of advertisement photography?

**IV.** Explain the challenges in sports photography.

**V.** Briefly analyse the traits and qualities of a wild-life photographer

**VI.** “Photographs are the paintings with light” -discuss the creative side of photography

**VII.** Explain the various types of camera lenses used for special tasks.

**VIII.** Evaluate the scope of photography and editing in the digital world

## **Second Semester: Elective Course**

### **MCJ 2E 02 : Travel Journalism**

#### **Module I**

Travel Journalism: Significance, relevance and scope, Role and responsibility of mass media in travel and tourism industry

#### **Module II**

Writing for Travel magazines, tourism brochures , travel books and travel e-zines; Tourism and hospitality industry and packages; Reporting -Travel marts, Calendar festival, fashion and food.

#### **Module III**

Travel writing: Narrative journalism, Personalized reporting and non –fiction writing.

Travel writers- William Dalrymple, Vikram Seth, Anita Nair, Dilip D'Souza, Samanth Subramanian, S K Pottakkad, M T Vasudevan Nair, Raveendran, Sakariya and Santhosh George Kulangara.

#### **Module 1V**

Content and packaging of major tourism magazines and Periodicals in English and Malayalam: review and analysis.

#### **Module V**

Role of photography and photo essays in travel writing

#### **Books for Reference:**

William Dalrymple : Nine Lives

Samanth Subramanian: Following Fish-Travels around the Indian coast

Vikram Seth: From Heaven Lake- Travels Through Sinkiang and Tibet

Dilip D'Souza: Road Runner

Anita Nair: The elephants are coming and other essays

S K Pottakad: London Notebook

M T Vasudevan Nair: Manushyar, Nizhalukal

Raveendran : Akalangalile Manushyar



Raveendran: Budha Padham

Zachariya : Nabiyude Nattil

Zachariya: Bum Bum Hara Hara Bum Bum Bol!

Santhosh George Kulangara: Baltic Diary

**I. Continuous Assessment : 15 marks**

**1. Class Test: 6marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

**2. Attendance : 4 marks**

Allotment of marks as per University regulations

**3. Seminar : 2.5 marks**

**4. Assignments: 2.5 marks**

**II. End Semester Examination: 60 marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 2E 02: Travel Journalism**

**Time : 3 hours**

**Max. Marks : 60**

Answer question one and FOUR others. All questions carry equal marks.

**I.** Write short notes on any four of the following

1. 'Nabiyude Naattil'
2. Safari Channel
3. Discover India
4. Centre spread
5. Travel marts
6. Jithendra Singh

**II.** What are the qualities required for a good travel writer, also identify the essential ingredients for an effective travel piece.

**III.** What is the role and responsibility of new media in travel and tourism industry?

**IV.** What is the role of photo essays and maps in writing travel pieces for magazines and periodicals?

**V.** Create a brochure for KTDC for their upcoming heritage tourism package in North Malabar.

**VI.** 'Travel books and magazines are replaced by e-zines and advertisements'-Discuss the statement.

**VII.** Explain the role of William Dalrymple in popularizing travel writing.

**Second Semester: Elective Course**  
**MCJ 2E 03 : Health Communication**

**MODULE 1**

Introduction to health Communication- Concept of health and Disease, Role of communication and campaigns in health and population programs

**MODULE II**

Communication process and principles applied to Health & population; various health policies of Indian governments and its communications via Mass media.

**MODULE III**

Media and Journalist: roles in health coverage; Non-traditional Media; Health Magazines; Print, Radio and Television: Health Information in News and Entertainment programs ;

Health Communication: in Blogs, podcasts and other e-media innovations; Risk and crisis of health communication in the media.

Health writing for print media: features, articles and columns.

**MODULE IV**

Communication Campaign –steps for conducting campaign- content and treatment of message; selection of the media, audience variable –monitoring feedback& evaluation- Preparation of stickers, posters, bill boards.

**MODULE V**

Health and family welfare programs in community-World Health Organization, UNICEF, Health campaigns in India- National health policy, India's population problem and National family welfare programs ;Campaign against Polio, AIDS/HIV, Malaria, Smallpox, Female infanticide, child mortality ,mother and baby care vaccinations.

### **Books for reference**

1. Danger, fear and insecurity by Seale, Clive. (2002): Chapter 4 in Media and Health, p 67-92, Sage.
2. Mass Communication and Public Health: Complexities and Conflict by Charles Atkin, & Larry Wallack (Eds.), Sage
3. Health Communication: From Theory to Practice by Renata Schiavo (2007), Jossey Bass, San Francisco
4. Handbook of Health Communication by Teresa L. Thompson.
5. Health Communication Message Design: Theory and Practice by Hyunyi Cho , Sage

### **I. Continuous Assessment: 15 marks**

#### **1. Class Test: 6 marks**

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module five

#### **2. Attendance : 4 marks**

Allotment of marks as per University regulations

#### **3. Seminar : 2.5 marks**

Analysis of any two health magazines either in English or Malayalam

#### **4. Assignments: 2.5 marks**

### **II. End Semester Examination: 60**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 2E 03 Health Communication**

**Time : 3Hours**

**Maximum Marks : 60**

Answers question one and FOUR others. All question carry equal marks

**I.** Write short notes on any four of the following.

1. National Population policy
2. UNICEF
3. ASHA
4. Child mortality
5. SITE
- 6 'Aarogyam'

**II.** Analyze content of two health magazines.

**III.** Explain the role of radio in promoting health campaigns.

**IV.** Explain the crisis faced by the media while reporting health campaign in India.

**V.** Prepare a poster for any polio campaign.

**VI.** Detail the role of Television in spreading awareness about family welfare  
Programmes

**VII.** Explain the major components of health communication

### **Third Semester: Elective Courses**

#### **MCJ 3E 04: Indian Politics and communication**

##### **Module I**

Political reporting from Colonial legacy; National Movement legacy; basic features and provisions of the Indian Constitution; linguistic organization of the States; regionalism.

##### **Module II**

Communication after independence: The Nehru era – major political parties and leaders, Congress and the Opposition; regional parties.

##### **Module III**

Political Communication: From Sastri to Indira Gandhi; Indira era – J.P. Movement and Emergency, Janata Coalition Government

##### **Module IV**

Media's role as political communicator: The Rajiv Years- Bofors and its aftermath; National Front Government; Pokhran II and Kargil War

##### **Module V**

Political agendas and reporting: Jammu and Kashmir; Punjab crisis; Mandal Commission, Babri Masjid, Godhra riots, 2G Spectrum scam and current issues.

Land reforms; agrarian struggles; green revolution; globalization, liberalization and privatization

##### **Module VI**

Reporting Kerala politics – a critique on major political parties and their leaders in Kerala; an analysis of performance of political parties in Legislative and Lok Sabha elections; constituencies and members of legislative assembly; a critique of the Coalition Governments; profile on Kerala Chief Ministers

#### **Books for Reference**

1. Bipan Chandra, India after Independence, Penguin Books, 2000
2. Ramachandra Guha, India after Gandhi, Macmillan, 2007

3. Zoya Hasan, Parties and Party Politics in India, Oxford India, 2004
4. R. K. Pruthi, Prime Ministers of India, Indiana Publishers, 2006
5. Nandan Nilekani, Imagining India, Penguin Books, 2008
6. K. C. John, Kerala Rashtriyam, Oru Asambandha Natatakam, Pen Books, 1999
7. Cherian Philip, Kaal Nootandu

### **I. Continuous Assessment: 15 marks**

#### **1. Class Tests: 6 marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

#### **2. Attendance : 4 marks**

#### **3. Seminar : 2.5 marks**

#### **4. Assignment: 2.5 marks**

### **II. End Semester Examination: 60 marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 3E 04: Indian Politics and communication**

**Time: 3 Hours**

**Marks : 60**

Answer question I and FOUR others. All questions carry equal marks

**I. Write Short Notes on any four of the following.**

1. Chipko Movement
2. GNLF
3. JKLF
4. Kamaraj Plan
5. Mandal Commission
6. Operation Blue Star

**II. “Coalition Government is a liability.” Substantiate your view**

**III. How should India proceed for a permanent solution to the Kashmir issue?**

**IV. “Maoism is the biggest internal threat to India.” Comment**

**V. “Communal politics is a dangerous trend in Kerala.” Elucidate**

**VI. “Regional parties are hazardous to unity and integrity of the nation.” Explain your stand.**

**VII. Make an objective analysis of the performance of the former UPA Government.**

**VIII. “Today the ideology of all the political parties seems to be same.” Critically.**

examine this statement.



**Third Semester: Elective Course**  
**MCJ 3E 05 : Agricultural Journalism**

**Module I**

Meaning, Nature, Scope and Characteristics of agricultural Journalism; Agricultural Movement in India, Media and Green Revolution; Role and Significance of Media in Agrarian Society; Status of Agricultural Journalism in India

**Module II**

Present Status of Production and Economic Condition of Farmers in India, The Present Agricultural Policy of India , Services and Implementation of Agriculture Related Departmental Programs; Agriculture and Indian economy.

**Module III**

Agricultural Media Reporting, Features, Interviews Articles, Analytical Stories, Techniques and Terminologies, Agricultural programs on TV Channels: Agricultural training centers - Communication program for farmers, extension training, Krishi mela and exhibition, loan mela, agricultural TV channel; Kisan TV, Kisan Vani, Agricultural radio program- Krishi ranga; Print: *Down to Earth* magazine.

**Module IV**

Agricultural supplements of Daily Newspapers, Agricultural Journals & Eminent Agricultural Scientists scientists Dr. M.S. Swaminathan, Dr. M. Mahadevappa (Paddy), L.Lakshmanaiah (Ragi), Dwarkanath (Extension technology) S.V. Rangaswamy, Narayana Reddy.

**Module V**

Recent trends and developments in Agricultural Journalism.

**Reference Books :**

1. Writing for farm families by Kamath, M.G
2. Mass Communication & Journalism in India .(2006) By Mehta D.S
3. Farm Journalism (2004) By Mukhopadhyaya
- 4 Claron Burnet: Agricultural news writing.
5. Nelson Antrim Cragard: Agricultural journalism.

6 Rodney Fox: Agricultural and Technical.

7 Agricultural news writing - Claron Burnett

8 Agricultural and Technical Journalism- Rodney Fox

9 The invisible farm - Thomas F Pawlick

10 Pioneer agricultural journalists - William E. Ogilvie

11. Agricultural journalism - Nelson Antrim Crawford 12. One straw revolution - Fukuoka Masanobu

### **I. Continuous Assessment: 15 marks**

#### **1. Class Tests: 6 marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

#### **2. Attendance : 4 marks**

#### **3. Seminar : 2.5 marks**

#### **4. Assignment: 2.5 marks**

### **II. End Semester Examination: 60 marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 3E 05 Agricultural Journalism**

**Time: 3 Hours**

**Marks: 60**

Answer question I and FOUR others. All questions carry equal marks

**I.** Answer any four of the following.

1. Dr. M.S Swaminathan
2. Agrarian society
3. Karshaka Sree
4. P.Sainath
5. Krishidershan
6. 'One-Straw revolution'.

**II.** Explain agricultural movements in India.

**III.** How Green Revolution helped Indian agricultural sector?

**IV.** Explain the role of media in agricultural development.

**V.** Write on Varghese Kurian and his contributions to White Revolution.

**VI.** Write on Agriculture and Indian economy.

**VII.** Detail meaning, nature, scope and characteristics of agricultural journalism.

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**Third Semester: Elective Course**  
**MCJ 3E 06 : BUSINESS JOURNALISM**

**Module I**

A foundational course on economics, covering all major schools of modern economic thinking - Classical, Neo-classical, Marxian, Keynesian and Monetarist

**Module II**

Milestones of Indian economy - Brief account of Indian economy on the eve of independence and after; process of the finalization of first five-year plan, general overview of Nehruvian model, bank nationalization, green revolution, control and permit raj and liberalization of the 1990s.

**Module III**

Business reporting and editing - corporate reporting; banking; policy-making institutions; market reporting- stock market, currency exchanges markets and commodity markets; regulatory bodies; company law; budget; trade policies

**Module IV**

Business newspapers, magazines, news agencies and television channels - A straight narrative on business dailies and magazines in the country as well as abroad - Wall Street Journal, Financial Times (London), The Economic Times, The Financial Express, Business Line, Economist, Fortune, Outlook Money, Outlook Business, Business Today, Business World and Business India; 24x7 television channels dedicated to business – CNBC, NDTV Profit and others; financial and data service wire agencies - NewsWire18, Reuters, Bloomberg, Dow Jones and others; Role of major dailies like Manorama, Mathrubhumi and the Hindu in covering business stories linked to Kerala; Specialized business journals: Business Today, Business Line, Dhanam, Business Deepika etc.

**Module V**

Salient features of Kerala economy on a national and global perspective - debate on Kerala model of development and the linkages of the state's economy with global markets; Cash crops in Kerala.

**Books for Reference**

1. Adam Smith, *Wealth of Nations*

2: Karl Marx, *Das Capital*

3: John Maynard Keynes, *General Theory of Employment, Interest and Money*

4. Joseph Schumpeter, *Capitalism, Socialism and Democracy*

### **Books for Further Reading**

1: Paul M Sweezy, *The Theory of Capitalist Development* (It is a classic text on understanding Marxist political economy)

2: Michael Lewis, *Liar's Poker* (It is a roller-coaster description of what really happens in Wall Street, the Mecca of Global financial markets. A good read for any aspiring journalist)

3: Robert Shiller, *Irrational Exuberance* (It is another work taking a close look at the functioning of financial markets)

4: Nouriel Roubini, a professor at Stern School of Business is widely credited with predicting the 2008 global financial crisis. He is a much sought after economist at present. *Political Cycles* and *Marco Economy and Bailout and Bail-in* are two books by him, which provide a perspective on economic meltdowns.

5: C.T. Kurien, *Global Capitalism and Indian Economy*, provides a good understanding of Indian economy on a global perspective. *Rethinking Economics*, reflections based on a study of Indian economy is also a good work for students.

6: Jagdish Bhajwati, a professor of Columbia University, long considered as a potential candidate for Nobel Prize in economics, is an ardent supporter of the liberalization, privatization and globalization theme. His book, *In Defense of Globalization*, is a good read.

7: John Bellamy Foster, *The Great Financial Crisis* is a very good book on the 2008 global financial crisis.

8: Robert McCheseny, *The Political Economy of Media* It is a very good book on linkages between big business groups and media in the U.S. The methodology used by McChesney could be extended to analyze media situation even in our country.

9. *Dollars and signs* is a very good internet site on business journalism

10: Robert Brenner, *The Boom and the Bubble: The US in World Economy* provides a lucid account of the role of American economy in driving global developments

11: Dr. K. K. George, *Limits to Kerala Model of Development* provides a good introduction to the chronic problem of fiscal deficits in Kerala

### **I. Continuous Assessment: 15 Marks**

#### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

#### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations

#### **3. Seminar : 2.5 Marks**

#### **4. Assignments : 2.5 Marks**

### **II. End Semester Examination: 60 Marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 3E 06 : Business Journalism**

**Time: 3 Hours**

**Max. Marks: 60**

Answer question I and FOUR others. All questions carry equal marks.

**I.** Write short notes on any FOUR of the following:

1. Business Cycle
2. SEBI
3. Sensex
4. NIFTY
5. FMC
6. Credit Policy

**II.** Trace the origin and development of modern stock exchanges.

**III.** Economic planning is not the best way for achieving rapid economic growth.

Do you agree with this statement in the context of the history of Indian economic growth?

**IV.** Write an essay on the significance of credit policy of Reserve Bank of India

**V.** Elucidate the role of World Bank and IMF as multi-lateral funding agencies

**VI.** What are the merits and de-merits of futures trading in agriculture commodities?

**VII.** Detail India's union budget making process

**VIII.** Detail the role of business television networks in spreading awareness about financial markets to a larger audience

## **MCJ: Third Semester: Elective Course**

### **MCJ 3E 07 : Development Communication**

#### **Module I**

First, second and third world; concepts of development; reasons for underdevelopment; indicators of development; empowerment and development communication; psychological and socio-economic constraints on development, development and globalization.

#### **Module II**

India's communication revolution from bullock cars to cyber marts; television and social change: SITE, Kheda and Jhabua communication projects, *Hum Log*; radio for development communication; community radio; print media and development communication; new media and development; folk/traditional media and development communication.

#### **Module III**

Theories and models of development – Adam Smith, Ricardo, Malthuse, Rostow, Marx and Mahatma Gandhi; modernization and dominant paradigm of development; sustainable and participatory development; Liberation theology – Paolo Freire, Brazilian experience, Sarvodaya Shramadana Movement in Sril Lanka, family life education in Ghana.

#### **Module IV**

Development communication models – Lerner, Schramm, Rogers; pro-persuasion model of development; mass media model of development; New World Information and Communication Order and McBride Commission Report; UNESCO Declaration on mass media.

#### **Module V**

Kerala model of development – Kerala's paradoxes, Kerala's industrial development, impact of migration on Kerala's economy and society, Kerala health model, People's Plan; media and development in Kerala.



### Books for Reference

1. Wilbur Schramm, **Mass Media and National Development**
2. Lerner, **The Passing of a Traditional Society**
3. Dube S.C., **India's Changing Villages: Human Factors in Community Development**
4. Srinivas Melkote & Leslie Steeves, **Communication for Development in the Third World**
5. Kuppaswamy, **Social Change in India**
6. Y.V.L. Rao, **Communication and Development**
7. Cheng, **Media Policies and National Development: Characteristics of 16 Asian Countries**
8. Majid Tehranian, **Communication Policy for National Development**
9. Thomas Friedman, **The World is Flat**
10. Singhal Rogers, **India's Communication Revolution: From Bullock carts to Cyber Marts**
11. J.P. Yadav, **Television and Social Change, Vol. I & II**
12. P. Sainath, **Everybody Loves a Good Drought**
13. Joseph Tharamanagalam, **Kerala: The paradoxes of Public Action and Development**
14. P. Surendran, **The Kerala Economy: Development, Problems and Prospects**

### I. Continuous Assessment: 15 Marks

#### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

#### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations

#### **3. Seminar : 2.5 Marks**

**4. Assignments**

**:2.5 Marks**

**II. End Semester Examination: 60 Marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 3E 07: Development Communication**

**Time: 3 Hours**

**Max. Marks: 60**

Answer question I and FOUR Others. All questions carry equal marks.

**I.** Write short notes on any four of the following.

1. Kheda communication project
2. Radio rural farm
3. Pro-development soap opera
4. Krishi Darshan
5. Environmental journalism
6. Extension communication

**II.** Discuss with the help of examples the potential of radio as a medium for rural development in India.

**III.** Critically evaluate Lerner's model of development communication.

**IV.** What are the criticisms leveled against the dominant paradigm of development?

**V.** Discuss the merits and demerits of the Kerala Development Model.

**VI.** What are the indicators of development? How can they be applied universally?

**VII.** Critically analyze W.W. Rostow's five-stage theory of growth.

**VIII.** Summarize the major theories of development communication proposed by Wilbur Schramm.

## **Fourth Semester: Elective Course**

### **MCJ 4E 08: Technical Writing**

#### **Module I**

Technical writing: definition- technical writing and other forms of writing, roles and functions of technical communicators in software and IT companies- Roles and responsibilities of technical writers and editors.

#### **Module II**

Stages in the preparation of a technical document - pre-writing, writing and post-writing; audience and task analysis; technical writing techniques - data collection methods, working with Subject Matter Experts (SMEs), collecting and organizing information, drafting information verbally and visually, working with images and illustrations and storyboarding.

#### **Module III**

Technical Writing Style Guide-Technical editing process: editing for accuracy, language and style; technical writing software tools.

#### **Module IV**

End products of Technical writing: reports, memos, proposals, letters, abstracts and user manuals.

#### **Module V**

Technical writing practice: ethics and other issues.

#### **Books for Reference**

1. Raman Sharma, **Technical Communication**, Oxford University, 2004
2. Barry J. Rosenberg, **Technical Writing for Engineers and Scientists**, Massachusetts, May 2005.
3. Paul V. Anderson, **Technical Communication A reader centered Approach**, New Delhi, Rahul Print O Pack, 2007.
4. Riordan Pauley, **Technical Report Writing Today**, Biztantra, 2004
5. Donald W Bush & Charles P Campbell, **How to Edit Technical Documents** Universities Press, 1995

6. Jason Whittaker, **Web Production for Writers and Journalists**, Routledge, 2002
7. Straubhaar La Rose, **Media Now**, Thomson Wadsworth, 2004
8. Stephen Quinn, **Digital Sub-editing and design**, Focal Press, 2001

**I. Continuous Assessment: 15 marks**

**1. Class Tests : 6 marks :**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

**2. Attendance : 4 marks**

**3. Seminar: 2.5 marks**

**4. Assignment : 2.5 marks**

**II. End Semester Examination: 60 marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 4E 08: Technical Writing**

**Time: 3 Hours**

**Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks

**I.** Write short notes on any four of the following

1. JPEG and MPEG
2. FTP
3. Field Reference
4. Usability
5. TIFF and GIFF

**II.** Explain the various stages involved in the preparation of technical documents.

**III.** “Technical writing is a team work.” Elucidate.

**IV.** Explain the different software tools used in Technical writing

**V.** Elaborate the quality parameters required in preparing documents?

**VI.** Explain the basic principles of Technical writing

**VII.** Explain the role of project manager in preparing project documents.

**VIII.** User manuals are the interfaces between laymen and technology. Substantiate.

**Fourth Semester: Elective Course**  
**MCJ 4E 09 : Fashion Communication**

**Module I**

History of Fashion: Recorded History of Fashion, Western and Indian-Fashion with reference to Paris; Origins of Indian Fashion – Jain and Buddhist documents: Sattika – Saree and Cilappathikaram by IlangoAdikal of Classical Tamil Literature -Indulgence of men on beautification-New philosophies emerge after French Revolutions-A emergence of ‘bourgeoisies’ or middle class-Russian Revolution.

**Module II**

Factors Influencing Fashion: Industrial Revolution as a key driver-World Wars influence on general lifestyle-Women’s entry into factory floors-Emergence of a new and more promising market: Earning Women-The birth of Designers and ‘Haute Couture’ -Fashion is dictated by Designers-Famous Designers and Design Houses; Eastern and Western Fashion concepts.

**Module III**

Designers: Charles Frederick Worth. Paul Poiret .Gabrielle Coco Chanel. Jean Patou. Madeleine Vionnet. Elsa Schiaparelli .Christian Dior .Cristobal Balenciaga .Pierre Cardin .Mary Quant. Yves Saint Laurent. Calvin Klein .Ralph Lauren .Giorgio Armani. Claude Montana .Moschino. Guccio Gucci. Issey Miyake. Kenzo. Rei Kawakubo. Hanae Mori. Donna Karan. Christian Lacroix. Paloma Picasso. Bijan. Alexander Mc Queen. Stella McCartney. Karl Lagerfeld .John Galliano. Jean Paul Gaultier. Hussein Chalayan. Yohji Yamamoto .Benetton .Dolce & Gabbana .Prada .Louis Vuitton.

David Abraham .Shahab Durazi .Sabyasachi Mukherjee .J J Vallaya .Ritu Beri. Ritu Kumar .Manish Arora .Anamika Khanna .Manish Malhotra .Sandeep Khosla .Raghavendra Rathore. Rohit Bal .Rajesh Pratap Singh. Wendell Rodrigues .Satya Paul .Suneet Verma .Tarun Tahliani

**Module IV**

Costumes as a communicative media in films/ Case Studies :

**International:**

- 1) Last Emperor – Transition from royal life to a commoner through invasion and revolution

- 2) Gladiator – Old Roman costumes (dramatized)
- 3) The Kid – European costumes of 20's and 30's
- 4) Gandhi – Swadeshi costumes during British Raj
- 5) Titanic – Post industrial British and American costumes showing the devised of classes

### **Indian:**

- 1) Devadas – Dramatised classical story
- 2) AngadiTheru – Costumes on fantasy of lower society
- 3) 3 Idiots – Representation of people with different characters
- 4) Celluloid – The transition from old cinema to new
- 5) Kodyettam – Picturisation of modern indian civilisation

### **Module V**

Fashion Trends Forecasting – Reading and Reporting : the role of journals, magazines and other media in forecasting-Studying market conditions-Noting the lifestyles of the customers-Feedback from customers-Past data analysis-Observing “street fashion” & what celebrities are wearing-Keeping up with current events, media, arts & the mood of the public Surveying Fashion publications, catalogs, magazines & fashion websites - Evaluating popular designer collections.

### **Books for reference:**

- 1) Understanding Media – Marshall Mc Luhan
- 2) Television – Raymond Williams
- 3) Language of Fashion – Roland Barthes
- 4) Fashion In Fiction Text And Clothing In Literature, Film And Television – Peter McNeil
- 5) Fashion and Music – Janice Miller
- 6) Advertising in the Fashion Industry – Anna Robbins
- 7) Objectified ( Movie) – Gary Hustwit
- 8) Introducing Culture Studies – Ziauddin Sardar (third edition)
- 9) Fashion Forecasting - Evelyn L. Brannon
- 10) The Next Big Thing: Spotting and forecasting consumer trends for profit, William Higham,
- 11) Cloth and Colonialism - Bernard Cohn.
- 12) Ancient & Medieval Indian Costumes - Roshan Alkazi



13) Costume Design 101: The Business and Art of Creating Costumes for Film and Television - Richard La Motte.

**Further reading :**

- 1) Ways of Seeing – John Berger
- 2) Introducing Semiotics – Paul Cobley
- 3) Lateral Thinking – Edward De Bono
- 4) Costume Design - Barbara and Cletus Anderson
- 5) Classical Indian Theatre - Ayyappa Pannicker.
- 6) Natyasastra - P.S.R. Appa Rao

**I. Continuous Assessment: 15 marks**

**1. Class Tests : 6 marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

**2. Attendance : 4 marks**

**3. Seminar : 2.5 marks**

**4. Assignment : 2.5 marks**

**II. End Semester Examination: 60 marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 4E 09: Fashion Communication**

**Time: 3 Hours**

**Max Marks : 60**

1) Discuss briefly any four of the following in 50 to 150 words each.

(4x 5 = 20)

- i) Fashion Seasons
- ii) Ramp Shows and Sale Shows
- iii) Haute Couture
- iv) Visual Merchanding
- v) Sari

2) **Write short notes on any four of the following**

(4x10 = 40)

- i) Difference between Indian and International fashion consumption
- ii) Paris as a Fashion Capital
- iii) Any Indian movie and its costume design
- iv) Contributions of World War II to the emergence of Fashion Design
- v) Any three Indian Fashion Designers and their signature styles.

## **Fourth Semester: Elective Course**

### **MCJ 4E 10 : Sports Journalism**

#### **Module I**

History of organized sports and sports journalism with special emphasis on India - ancient and modern sports, Olympics, cricket, tennis, hockey, football, volleyball and athletics; sports journalism as a specialized field of activity in India. Its fledgling days, its growth with the Asian Games in 1951, the jump with India's Prudential Cup victory, and the future

#### **Module II**

Rules and regulations of major sports events; sports statistics; sports institutions – international, national and local; professional sports academies

#### **Module III**

Sports desk operation; qualities of a sports reporter; structure of sports writing - types of sports writing - match reports, interviews, features and profiles; choosing the right subject matter and angle; interviewing skills and techniques; feature styles, intro, middle and end; investigative reports; writing for the tabloid, broadsheet, internet, radio and television

#### **Module IV**

Impact of sports on society; ethics and the sports journalist: balance and impartiality; sports and politics; drug abuse and sports; violence in sports; sports as business and entertainment

#### **Module V**

Perception of sports in mass media - influence of the new media on print, reporting turning analytical; scripting sports stories for television and radio; preparing reviews, and interviews for television and radio; television and radio sports commentary; live sports reporting

## **Module VI**

Sports columns; ghost writing; sports photography; sub-editing and design; analysis of sports pages of English and Malayalam newspapers; a critique of English and Malayalam sports magazines; analysis of sports channels; popular sports analysis programmes on television

### **Books for Reference**

1. Stanley Woodward, **Sports Page**
2. Brad Schultz, **Sports Media: Reporting, Producing and Planning**
3. Rajan Bala, **The Covers Are Off**
4. Ramachandra Guha, **The States of Indian Cricket**
5. Raymond Boyle, **Sports Journalism: Context and Issues**
6. Boria Majumdar, **Indian Cricket Through the Ages**
7. Conrad Fink, **Sports Writing**
8. R.G. Goel, **Encyclopedia of Sports and Games**
9. Goodwill, **Great Sports Personalities of the World**
10. Ray Stubbs, **Sports Book**
11. Garry Whannel, **Media Sports Stars**

### **I. Continuous Assessment: 15 Marks**

#### **1. Class Tests : 6 Marks**

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

#### **2. Attendance : 4 Marks**

Allotment of marks as per University regulations

#### **3. Seminar : 2.5 Marks**

#### **4. Assignments : 2.5 Marks**

### **II. End Semester Examination: 60 Marks**

**Model Question Paper**  
**MCJ Degree Examination**

**MCJ 4E 10: Sports Journalism**

**Time: 3 Hours**

**Max. Marks: 60**

Answer question I and FOUR others. All questions carry equal marks

**I.** Write short notes on any four of the following.

1. Curtain-raiser
2. Neo Sports
3. Color Pieces
4. Ghost writing
5. Underlay
6. Upsound

**II.** Write a review of a Malayalam sports magazine.

**III.** Prepare a profile of Sania Mirza.

**IV.** Critically analyze the sports pages of two English newspapers.

**V.** “Indian media is obsessed with cricket.” Comment.

**VI.** How is radio commentary different from television?

**VII.** Discuss the challenges faced by print and broadcast sports journalists in the context of the new media environment. **VIII.** Examine the impact on sports journalism with the ongoing commercialization of the sports industry and media corporations.



KANNUR UNIVERSITY  
(Abstract)

B.A English Programme- Scheme of Core & Generic Elective Courses of the Programme and Syllabus and Pattern of Question Paper of the 1<sup>st</sup> Semester of B.A English (Language and Literature) under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated Colleges with effect from 2019 Admission- Implemented- Orders issued.

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ACADEMIC BRANCH

No.Acad.C3/13219/2019

Dated: Civil Station P.O .26.06.2019

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- Read:-
1. U.O.No.Acad.C2/429/2017 dated,10-10-2017
  2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
  3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.
  4. The Minutes of the Meeting of the Board of Studies in English (UG), held on 14.06.2019
  5. Scheme and 1st Semester Syllabus of B.A English (Language and Literature) Programme, Submitted by the Chairperson, Board of Studies in English (UG), dated: 22.06.2019

**ORDER**

1.A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG Programmes in Affiliated Colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision Processes such as conducting the meeting of various Boards of Studies, Workshops, & discussions.

3. The Revised Regulation for UG Programmes in Affiliated Colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. As per paper read (4) above, the Board of Studies in English (UG) finalized the Scheme of Core, & Generic Elective Courses ,Syllabus and Pattern of Question Papers of B.A English (Language and Literature) Programme, to be implemented with effect from 2019 Admission.

5. Subsequently, as per paper read (5) above, the Chairperson, Board of Studies in English (UG) , submitted the finalized copy of the Scheme of Core & Generic Elective Course and Syllabus and Pattern of Question Paper of the 1<sup>st</sup> Semester of B.A English (Language and Literature) Programme, for implementation with effect from 2019 Admission.

6. The Vice Chancellor, after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, accorded sanction to implement the Scheme of Core & Generic Elective Courses and Syllabus and Pattern of Question Papers of the 1<sup>st</sup> Semester of B.A English (Language and Literature) Programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated Colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme of Core & Generic Elective Courses and Syllabus and Pattern of Question Paper of the 1<sup>st</sup> Semester of B.A English (Language and Literature) Programme, are uploaded in the University Website ([www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in))

Orders are issued accordingly.

Sd/-  
DEPUTY REGISTRAR(ACADEMIC)  
For REGISTRAR

To  
The Principals of Colleges offering B.A English Programme

- Copy to:-
1. The Examination Branch (through PA to CE)
  2. The Chairperson, Board of Studies in English (UG)
  3. PS to VC/PA to PVC/PA to Registrar
  4. DR/AR-I/ARII (Academic)
  5. The Computer Programmer (for uploading in the website)
  6. SF/DF/FC



Forwarded/By Order

SECTION OFFICER

For more details log on to [www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in)



# **KANNUR UNIVERSITY**

**BOARD OF STUDIES IN ENGLISH (U.G.)**

## **SYLLABUS OF CORE COURSES OF B.A ENGLISH LANGUAGE AND LITERATURE PROGRAMME AND GENERIC ELECTIVE COURSES**

**CHOICE BASED CREDIT AND SEMESTER SYSTEM**

**(2019 ADMISSION ONWARDS)**



**KANNUR UNIVERSITY**  
**VISION AND MISSION STATEMENTS**

**Vision:** To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

**Mission:**

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards. To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

## **Kannur University**

### **Programme Outcomes (PO)**

#### **PO 1.Critical Thinking:**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

#### **PO 2.Effective Citizenship:**

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

#### **PO 3.Effective Communication:**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

#### **PO 4.Interdisciplinarity:**

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

### **Programme Specific Outcomes for BA in English Language and Literature**

PSO 1. Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

PSO 2. Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

PSO 3. Understand and apply the extended meaning of “English Literature” to various post-colonial and other writings in English.

PSO 4. Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women’s Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

PSO 5. Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

**KANNUR UNIVERSITY****B.A ENGLISH PROGRAMME PROGRAMME****COURSE AND CREDIT DISTRIBUTION STATEMENT**

| Courses                                | No of Courses |           | Credit |            |
|----------------------------------------|---------------|-----------|--------|------------|
|                                        |               |           |        |            |
| English Common Course (ECC)            |               | 6         |        | 22         |
| Additional Common Course (ACC)         |               | 4         |        | 16         |
| Core Course                            | 15            | 16        | 60     | 64         |
| Discipline Elective Core Course (DSEC) | 1             |           | 4      |            |
| Complimentary Elective Course (CEC)    |               | 4         |        | 16         |
| Generic Elective Course (GEC)          |               | 2         |        | 2          |
| <b>Total</b>                           |               | <b>32</b> |        | <b>120</b> |

**KANNUR UNIVERSITY****B.A ENGLISH PROGRAMME PROGRAMME****WORK AND CREDIT DISTRIBUTION STATEMENT**

| Semester  | Course Title                                               | Credits | Hours per week | Marks |     |       |
|-----------|------------------------------------------------------------|---------|----------------|-------|-----|-------|
|           |                                                            |         |                | CE    | ESE | TOTAL |
| <b>I</b>  | English Common Course-I                                    | 4       | 5              | 10    | 40  | 50    |
|           | English Common Course-II                                   | 3       | 4              | 10    | 40  | 50    |
|           | Additional Common Course-I                                 | 4       | 4              | 10    | 40  | 50    |
|           | Complementary Elective Course-1                            | 4       | 6              | 10    | 40  | 50    |
|           | Core Course-I- Malayalam Literature in English Translation | 5       | 6              | 10    | 40  | 50    |
| <b>II</b> | English Common Course-III                                  | 4       | 5              | 10    | 40  | 50    |
|           | English Common Course-IV                                   | 3       | 4              | 10    | 40  | 50    |

|            |                                                                            |   |   |    |    |    |
|------------|----------------------------------------------------------------------------|---|---|----|----|----|
|            | Additional Common Course-II                                                | 4 | 4 | 10 | 40 | 50 |
|            | Complementary Elective Course-II                                           | 4 | 6 | 10 | 40 | 50 |
|            | Core Course-II- Academic Writing, Methodology and Research Project         | 5 | 6 | 10 | 40 | 50 |
| <b>III</b> | English Common Course-IV                                                   | 4 | 5 | 10 | 40 | 50 |
|            | Additional Common Course-III                                               | 4 | 5 | 10 | 40 | 50 |
|            | Complementary Elective Course-III                                          | 4 | 6 | 10 | 40 | 50 |
|            | Core Course III- Old English to Medieval English Literature (500-1500)     | 3 | 4 | 10 | 40 | 50 |
|            | Core Course-IV- Renaissance and Restoration Literatures (1485-1780)        | 4 | 5 | 10 | 40 | 50 |
| <b>IV</b>  | English Common Course VI                                                   | 4 | 5 | 10 | 40 | 50 |
|            | Additional Common Course-IV                                                | 4 | 5 | 10 | 40 | 50 |
|            | Complementary Elective Course-IV                                           | 4 | 6 | 10 | 40 | 50 |
|            | Core Course-V- The Romantic Period (1780-1832)                             | 4 | 5 | 10 | 40 | 50 |
|            | Core Course VI- The Victorian Period (1832-1901)                           | 3 | 4 | 10 | 40 | 50 |
| <b>V</b>   | Core Course VII- The Early Twentieth Century ((1901-1939)                  | 4 | 6 | 10 | 40 | 50 |
|            | Core Course VIII- The Late Twentieth and Twenty-First Centuries(1939-2018) | 5 | 6 | 10 | 40 | 50 |
|            | Core Course IX- Post colonial Literatures in English                       | 5 | 6 | 10 | 40 | 50 |
|            | Core Course X- Linguistics                                                 | 4 | 5 | 10 | 40 | 50 |

|              |                                               |            |            |    |    |             |
|--------------|-----------------------------------------------|------------|------------|----|----|-------------|
|              | Core Course XI- Project                       | 2          | 1          | 5  | 20 | 25          |
|              | Generic Elective Course                       | 2          | 2          | 5  | 20 | 25          |
| <b>VI</b>    | Core Course XII - Critical Theory             | 5          | 6          | 10 | 40 | 50          |
|              | Core Course XIII- Women's Writing             | 4          | 5          | 10 | 40 | 50          |
|              | Core Course XIV- Indian Writing in English    | 3          | 4          | 10 | 40 | 50          |
|              | Core Course XV- Film Studies                  | 4          | 5          | 10 | 40 | 50          |
|              | Core Course XVI- Discipline Specific Elective | 4          | 4          | 10 | 40 | 50          |
| <b>TOTAL</b> |                                               | <b>120</b> | <b>150</b> | -  | -  | <b>1500</b> |

**TOTAL CREDIT (Sum of total credits of all semester): 120**

**TOTAL MARKS (Sum of total marks of all semester): 1500**

**(2019 ADMISSION ONWARDS)**

**Core Courses in English Language and Literature**  
**Programme Specific Outcomes for BA in English Language and Literature**

PSO 1. Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

PSO 2. Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

PSO 3. Understand and apply the extended meaning of “English Literature” to various post-colonial and other writings in English.

PSO 4. Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women’s Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

PSO 5. Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

**B.A. ENGLISH LANGUAGE AND LITERATURE--CORE COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**PART -1 (CORE COURSES)**

| COURSE CODE  | COURSE TITLE                                             | SEMESTER | HOURS PER WEEK | CREDIT    | EXAM HRS |
|--------------|----------------------------------------------------------|----------|----------------|-----------|----------|
| 1B01ENG      | Malayalam Literature in English Translation              | I        | 6              | 5         | 3        |
| 2B02ENG      | Academic Writing, Methodology and Research Project       | II       | 6              | 5         | 3        |
| 3B03ENG      | Old English to Medieval English Literature (500-1500)    | III      | 4              | 3         | 3        |
| 3B04ENG      | Renaissance and Restoration Literatures (1485-1780)      | III      | 5              | 4         | 3        |
| 4B05ENG      | The Romantic Period (1780-1832)                          | IV       | 5              | 4         | 3        |
| 4B06ENG      | The Victorian Period (1832-1901)                         | IV       | 4              | 3         | 3        |
| 5B07ENG      | The Early Twentieth Century ((1901-1939)                 | V        | 6              | 4         | 3        |
| 5B08ENG      | The Late Twentieth and Twenty-First Centuries(1939-2018) | V        | 6              | 5         | 3        |
| 5B09ENG      | Postcolonial Literatures in English                      | V        | 6              | 5         | 3        |
| 5B10ENG      | Linguistics                                              | V        | 5              | 4         | 3        |
| 6B11ENG      | Project                                                  | VI       | 1              | 2         | --       |
| 6B12ENG      | Critical Theory                                          | VI       | 6              | 5         | 3        |
| 6B13ENG      | Women's Writing                                          | VI       | 5              | 4         | 3        |
| 6B14ENG      | Indian Writing in English                                | VI       | 4              | 3         | 3        |
| 6B15ENG      | Film Studies                                             | VI       | 5              | 4         | 3        |
| 6B16ENG      | Discipline Specific Elective                             | VI       | 4              | 4         | 3        |
| <b>TOTAL</b> |                                                          |          | -              | <b>64</b> |          |



**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> | <b>MARKS(EXCEPT<br/>6B11ENG &amp; GEC)</b> |
|-------------------|------------------|--------------------------------------------|
| EXTERNAL          | 80 %             | 40                                         |
| INTERNAL          | 20%              | 10                                         |

**CONTINUOUS INTERNAL ASSESSMENT**

| <b>COMPONENT</b>             | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|------------------------------|------------------|--------------|
| COMPONENT1<br>TEST PAPER     | 50%              | 5            |
| COMPONENT 2<br>ASSIGNMENT    | 25%              | 2.5          |
| COMPONENT 3<br>SEMINAR /VIVA | 25%              | 2.5          |

## Course Outcomes and Content Specifications for Core Courses

### CORE COURSE 1. Malayalam Literature in English Translation

| Course Code | Course Title                                | Semester | Credit | Hours |
|-------------|---------------------------------------------|----------|--------|-------|
| 1B01 ENG    | Malayalam Literature in English Translation | I        | 5      | 6     |

#### Course Outcomes

CO 1: Understand the word ‘literature’ and ‘literary’ in a broad and inclusive perspective by reading select literary pieces and by applying critical reading strategies.

CO 2: Recognise and describe literary genres and its subclasses.

CO 3: Describe with examples select literary terms and concepts.

CO 4: Understand the basic issues related to translation and in that process develop a sensibility for native and local literatures.

CO 5: Use English to translate and describe everyday activities, regional themes and personal narratives by reading Malayalam literature in translation.

CO 5: Learn to read, enjoy, analyse and critically engage with select literary pieces on their own with minimum guidance.

#### Content Specifications

##### **Module 01 (2Hrs/Week)**

9. Unit 1 (Classroom Teaching)  
What is Literature? by SwapnaGopinath
10. Unit 2 (Classroom Teaching)  
“In the Flood” by ThakazhiSivasankaraPillai
11. Unit 3 (Self Study)  
“Mother” by Vaikom Muhammad Basheer
12. Unit 4 (Classroom Teaching)  
“The Girl who spreads light” by T. Padmanabhan
13. Unit 5 (Self Study)  
“Puranavam” by Chandramathi
14. Unit 6 (Classroom Teaching)  
“Bhagavatha” by Vijayalakshmi
15. Unit 7 (Self Study)  
“Writing” by AnithaThampi
16. Unit 8 (Classroom Teaching)  
“The Last Leaf” by Veeran Kutty
17. Unit 9 (Self Study)  
“Write, Write, Write, Write” by P Raman

**Module 02 (2 Hrs/Week)**

18. Unit 10 (Classroom Teaching)  
Approaches to Literature by Sreerag P. K.
19. Unit 11 (Classroom Teaching)  
“After the Hanging” by O V Vijayan
20. Unit 12 (Self Study)  
“The Scent of a Bird” by Madhavikkutty
21. Unit 13 (Classroom Teaching)  
“Madness” by C.Ayyappan
22. Unit 14 (Self Study)  
“Cucumber Town” by N Prabhakaran
23. Unit 15 (Classroom Teaching)  
“Right in Front of Our Eyes” by P.P.Ramachandran
24. Unit 16 (Self Study)  
“After the War” by Sachidanandan
25. Unit 17 (Classroom Teaching)  
“Antony Terrikan” by P N Gopikrishnan
26. Unit 18 (Self Study)  
“Lion Hunters” by D. Vinayachandran

**Module 03 (2 Hrs/Week)**

27. Unit 19 (Classroom Teaching)  
Translations: Crossing Borders by E.V. Fathima
28. Unit 20 (Classroom Teaching)  
“Amphibious Life” by SanthoshEchikkanam
29. Unit 21 (Self Study)  
“Scooter” by Sarah Joseph
30. Unit 21 (Classroom Teaching)Sreehari  
“My Sister’s Bible” by S Joseph
31. Unit 22 (Self Study)Sreehari  
“Etc. by M R Renukumar
32. Unit 23 (Classroom Teaching)  
“The Enchantress of Fried Fish” by Paul Zacharia
33. Unit 24 (Self Study)  
“The Days of Honour and Humiliation” by NithyaChaithanyaYathi

**Prescribed Textbook:** *Crossing the Borders: Malayalam Literature in English Translation* published by Saradhi Publishers

## Model Question Paper

### Malayalam Literature in English Translation 1B01 ENG

Duration : 3hrs

Max. Marks: 40

#### Section -A

**I.** Answer any **seven** in a sentence or two:

1. How does the dog prevent the thief from breaking into the hut through the rooftop crack?
2. How does a student benefit from the study of literature?
3. Why does the leaf wait with a “mischievous” smile for the ant’s mother?
4. How did Kuttihassan greet Vellayi-appan?
5. What did Terikkan become in his life?
6. Name some of the ways of approaching a literary work?
7. Where did the train come to a stop after derailment?
8. How did the snake survive in the well without eating the frog?
9. Why is the SSLC Book kept in the Bible?
10. How does Rabassa defend the charges against translations? (7x1=7 marks)

**II.** Answer any **three** in about 80 words each:

11. What was the real reason behind the demand of Indian labourers to South Africa?
12. Bring out instances from the story “Madness”, where Krishnankutty’s subservience to his wife becomes evident.
13. How do the animals respond to the presence of the train in their midst?
14. What were the reasons behind the narrator’s decision to commit suicide in “The Girl who spreads light?”
15. What constitutes the mighty *Bhagavatha* "that will end only when my life ends?" How is it different from the other *Bhagavatha* mentioned in the poem?

16. How did the frog win the battle of life and death? (3x3=9 marks)

**III.** Answer any **one** in about 200 words:

17. How does Zachariah succeed in exploring the colonial history of South Africa?

18. Consider the story “In the Flood ”as a fable that throws light on how human beings behave when there is a natural disaster.

19. Examine how the wife and daughter of Krishnankutty manifest the contrast between tradition and modernity. (1x8=8 marks)

### Section B

**IV.** Answer any **two** in 80 words each:

20. Comment on the title “The Scent of a Bird”

21. Influence of Gandhian thoughts in “Mother”

22. What do the poets convey about ‘art’ in “Lion Hunters” and “Writing.”

23. Narrate Yati’s experience of student life in your words.

24. Reflection of nuclear family in “Scooter” (2x4=8 marks)

### Section C

**V.** Read the passage given below and answer the following questions:

A sanctuary may be defined as a place where Man is passive and the rest of Nature active. Till quite recently Nature had her own sanctuaries, where man either did not go at all or only as a tool-using animal in comparatively small numbers. But now, in this machinery age, there is no place left where man cannot go with overwhelming forces at his command. He can strangle to death all the nobler wild life in the world to-day. Tomorrow he certainly will have done so, unless he exercises due foresight and self-control in the mean time.

There is not the slightest doubt that birds and mammals are now being killed off much faster than they can breed. And it is always the largest and noblest forms of life that suffer most. The whales and elephants, lions and eagles, go. The rats and flies, and all mean parasites, remain. This is inevitable in certain cases. But it is wanton killing off that I am speaking of tonight. Civilized man begins by destroying the very forms of wild life he learns to appreciate most when he becomes still more civilized. The obvious remedy is to begin conservation at an earlier stage, when it is easier and better in every way, by enforcing laws for close seasons, game preserves, the selective protection of certain species, and sanctuaries.

I have just defined a sanctuary as a place where man is passive and the rest of Nature active. But this general definition is too absolute for any special case. The mere fact that man has to protect a sanctuary

does away with his purely passive attitude. Then, he can be beneficially active by destroying pests and parasites, like bot-flies or mosquitoes, and by finding antidotes for diseases like the epidemic which periodically kills off the rabbits and thus starves many of the carnivores to death. But, except in cases where experiment has proved his intervention to be beneficial, the less he upsets the balance of Nature the better, even when he tries to be an earthly Providence.

### **Part -I**

1. What is the definition of a sanctuary according to the speaker?
2. Which group of creatures suffer most due to human atrocities?
3. What is the obvious remedy to the problem according to the speaker?
4. How can Man be beneficially active?
5. Choose the word from the passage which means 'that which cannot be avoided'.

(5x1=5 marks )

### **Part - II**

**VI.** Based on the passage given above answer any **one** of the following question in 80 words.

6. How does the author ironically contradict his/her own definition of sanctuary in the passage?
7. The narrator is purposefully using the pronoun 'he' to refer to human beings. Elucidate
8. Comment on the tone of the author as expressed in the passage.

(1x3=3marks)

## Malayalam Literature in English Translation 1B01 ENG

### Pattern of Question Paper

#### SECTION –A (Classroom Study)

- I. Seven out of ten short answer questions from Classroom Study section in all modules (7x1=7)
- II. Three out of six paragraph questions from Classroom Study section in all modules (3x3= 9)
- III. One out of three essay questions from Classroom Study section in all modules (1x8=8)

#### SECTION B (Guided Self-Study)

- IV. Two out of five paragraph questions from **Guided Self-Study** section of all modules (2x4=8)

#### SECTION C (Comprehension Passage)

##### V. Part –I

Five out of five short answer/ one word type questions based on the passage. (1x5=5)

##### Part – II

One out of three paragraph questions of analytical nature based on the passage. (1x3=3)

## 2. Academic Writing, Methodology and Research Project

| Course Code | Course Title                                       | Semester | Credit | Hours |
|-------------|----------------------------------------------------|----------|--------|-------|
| 2B02ENG     | Academic Writing, Methodology and Research Project | II       | 5      | 6     |

### Course Outcomes

- ☐ 1. Understand and apply the nuances of academic writing.
- ☐ 2. Understand the various methodological as well as epistemological aspects of literary studies.
- ☐ 3. Familiarise with the approaches to literature.
- ☐ 4. Choose a tentative topic for the research project to be submitted in semester six.

### Content Specifications

Academic Documentation, MLA Style sheet, Citations and Acknowledgements, Format of an Academic Paper, Choosing a Topic, Paratextual Formalities, Ontological and Epistemological Aspects of Research, Methodology, Approaches to Literature, Schools of Theory, Logical Fallacies, Scientific Method.

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|-------------------|------------------|--------------|
| EXTERNAL          | 80 %             | 40           |
| INTERNAL          | 20%              | 10           |

**CONTINUOUS INTERNAL ASSESSMENT**

| <b>COMPONENT</b>             | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|------------------------------|------------------|--------------|
| COMPONENT1<br>TEST PAPER     | 50%              | 5            |
| COMPONENT 2<br>ASSIGNMENT    | 25%              | 2.5          |
| COMPONENT 3<br>SEMINAR /VIVA | 25%              | 2.5          |



### 3. Old English to Medieval English Literature (500-1500)

| Course Code | Course Title                                          | Semester | Credit | Hour |
|-------------|-------------------------------------------------------|----------|--------|------|
| 3B03ENG     | Old English to Medieval English Literature (500-1500) | III      | 3      | 4    |

#### Course Outcomes

- 1. Have an understanding of the contexts which produced Old English literature.
- 2. Read translation extracts from key texts of the Old English period
- 3. Understand the key aspects of Old English language.
- 4. Understand the key genres, authors, texts, styles and themes of the Medieval English Period.
- 5. Read excerpts from the variety of writings produced during this period.
- 6. Understand the key aspects of Medieval English dialects.

#### Content Specifications

**Historical Overview:** Roman Occupation, Anglo-Saxon Conquest, Kingship, Feudalism, The Church,  
**Literary Overview:** Language, Epic and Romance, The Rise of Theatre, The Church and Literature, Wealth and Wages, Men Writing about Women, Excerpts from Select Texts.

#### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

#### CONTINUOUS INTERNAL ASSESSMENT

| COMPONENT                    | WEIGHTAGE | MARKS |
|------------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER     | 50%       | 5     |
| COMPONENT 2<br>ASSIGNMENT    | 25%       | 2.5   |
| COMPONENT 3<br>SEMINAR /VIVA | 25%       | 2.5   |

#### 4. Renaissance and Restoration Literatures (1485-1780)

| Course Code | Course Title                                        | Semester | Credit | Hour |
|-------------|-----------------------------------------------------|----------|--------|------|
| 3B04ENG     | Renaissance and Restoration Literatures (1485-1780) | III      | 4      | 5    |

#### Course Outcomes

- ☐ 1. Define Renaissance literature/ Problems of definition
- ☐ 2. Trace the relationship between political economy, cultural history and production of arts and literature during the early modern period
- ☐ 3. Read specimens of major works belonging to the Renaissance period.
- ☐ 4. Understand the problematics of “modernisation” of Britain including the development of political parties and parliamentary democracy through the cultural productions of Restoration period
- ☐ 5. Identify literary narratives that deal with slave trade and colonial aspirations.
- ☐ 6. Understand the development of literary criticism as a meta-narrative to literature.
- ☐ 7. Read specimens of major works belonging to the Restoration period.

#### Content Specifications

**Historical Overview: (Renaissance)** Tudor Sovereignty, 1485-1603- The Early Stuarts and the Interregnum-The British Nations-Culture and Society of the Renaissance- Politics, Power and Ideologies, Belief and Thought.

**(Restoration):** The Monarchy, 1660-1745, Restoration- The Exclusion Crisis- James II- The Glorious Revolution- Succession Crises- The South Sea Bubble- The Last Jacobite Rebellion- Agriculture- London’s Restorations- Urbanisation- Consumer Culture- Education- Marriage- Greenwich and Political Geography- Evangelism and Methodism.

**Literary Overview: (Renaissance)** Literacy and Education, Continuities, Innovations and Influences, Intellectual Influences, Writing, Production, Consumption and the Marketplace, Language- Forms, Genres, Styles- Authors, Texts, Subjects-Texts and Political Structures- Gender Roles and Relations- Love and Sexuality- Nationhood, Race, Colonialism and Empire- Excerpts from Select Texts of the Renaissance Period.

**(Restoration):** Literature and Letters- Restoration Poetry- Restoration Drama- The Origin of the Novel- Beginnings of Literary Criticism- The Enlightenment- The Royal Society and Institutions of Modern Science- Select Texts of the Restoration Period.

#### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

**CONTINUOUS INTERNAL ASSESSMENT**

| COMPONENT                    | WEIGHTAGE | MARKS |
|------------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER     | 50%       | 5     |
| COMPONENT 2<br>ASSIGNMENT    | 25%       | 2.5   |
| COMPONENT 3<br>SEMINAR /VIVA | 25%       | 2.5   |

**5. The Romantic Period (1780-1832)**

| Course Code | Course Title                    | Semester | Credit | Hour |
|-------------|---------------------------------|----------|--------|------|
| 4B05ENG     | The Romantic Period (1780-1832) | IV       | 4      | 5    |

**Course Outcomes**

- ▣ 1. Understand the cultural history of the period and recognise the features of literary romanticism
- ▣ 2. Trace the relationship between political economy, cultural history and production of arts and literature with reference to the romantic period
- ▣ 3. Read specimens of major works belonging to the period.

**Content Specifications**

**Historical Overview:** Culture and Society- The Industrial Revolution- Belief and Thought Systems- Politics, Power and Ideologies- The Slave Trade and Abolitionism-

**Literary Overview:** Influence of Industrial Revolution- Modes of Production and Consumption- The Literary Marketplace- The Periodicals- Authors, Texts and Subjects- Women Romantic Poets- Labouring Poets- The Romantic Novel- Romantic Drama- Class, Power and Politics- Land and Landscape- The Sublime and the Beautiful- Science- Gender and Sexuality- Nationhood, Empire and the Orient- Slavery- Select Texts of the Romantic Period.

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|-------------------|------------------|--------------|
| EXTERNAL          | 80 %             | 40           |
| INTERNAL          | 20%              | 10           |

**CONTINUOUS INTERNAL ASSESSMENT**

| <b>COMPONENT</b>             | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|------------------------------|------------------|--------------|
| COMPONENT1<br>TEST PAPER     | 50%              | 5            |
| COMPONENT 2<br>ASSIGNMENT    | 25%              | 2.5          |
| COMPONENT 3<br>SEMINAR /VIVA | 25%              | 2.5          |

## 6. The Victorian Period (1832-1901)

| Course Code | Course Title                     | Semester | Credit | Hour |
|-------------|----------------------------------|----------|--------|------|
| 4B06ENG     | The Victorian Period (1832-1901) | IV       | 3      | 4    |

### Course Outcomes

- ▣ 1. Understand a range of Victorian literature in relation to a range of contexts including Victorian anxieties about modernity, madness, sexual transgression and disease.
- ▣ 2. Analyze the work of a range of Victorian writers, both canonical and less well-known, and with a range of genres including the novel, short story and poetry.
- ▣ 3. Identify and discuss theoretical discourses concerning class, sexuality, gender and colonialism as these illuminate a range of Victorian texts.
- ▣ 4. Understand and successfully deploy a range of terms and concepts integral to Victorian literature.

### Content Specifications

**Historical Overview:** Social and Political Transformations- Queen Victoria- Government, the Reform Acts, and the Beginnings of Mass Democracy- Benjamin Disraeli- Legislative Innovations and Social Reform- Religion- Science, Technology and Innovation- The Great Exhibition- Technological Travel, Commerce and the British Empire- Printing-

**Literary Overview:** Major Influences- Socio-political Background- Modes of Production and Consumption- The Literary Marketplace- Language and Forms- Genres and Styles- The Victorian Novel- Victorian Poetry- Pre-Raphaelites- Victorian Drama- Essays- Class Relations and Conflict- The Colonial Situation- Cityscapes- Victorian Ruralism- Science and Nature- The Crises of Faith- Gender Roles and Relations- Select Texts of the Victorian Period.

### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

**CONTINUOUS INTERNAL ASSESSMENT**

| <b>COMPONENT</b>             | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|------------------------------|------------------|--------------|
| COMPONENT1<br>TEST PAPER     | 50%              | 5            |
| COMPONENT 2<br>ASSIGNMENT    | 25%              | 2.5          |
| COMPONENT 3<br>SEMINAR /VIVA | 25%              | 2.5          |

## 7. The Early Twentieth Century ((1901-1939))

| Course Code | Course Title                              | Semester | Credit | Hour |
|-------------|-------------------------------------------|----------|--------|------|
| 5B07ENG     | The Early Twentieth Century ((1901-1939)) | V        | 4      | 6    |

### Course Outcomes

- ▣ 1. Understand the cultural, political, and stylistic protocols of modernism and its various literary movements.
- ▣ 2. Trace the relationship between political economy, cultural history and production of arts and literature
- ▣ 3. Read specimens of major works belonging to the period.

### Content Specifications

**Historical Overview:** Georgian Era- Discords within the Nation- Liberal Reform and the Rise of the Labour- Irish Home Rule- The First World War- Britain between the Wars- Politics, Economy and Social Change-

**Literary Overview:** Modernism- Modes of Production and Consumption- Forms, Genres and Styles of the Period- The First World War and Literature- Women in Society- Feminism and the Suffrage Movement- Psychology and Perception- Cubism- Select Texts of the Period.

### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

### CONTINUOUS INTERNAL ASSESSMENT

| COMPONENT                    | WEIGHTAGE | MARKS |
|------------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER     | 50%       | 5     |
| COMPONENT 2<br>ASSIGNMENT    | 25%       | 2.5   |
| COMPONENT 3<br>SEMINAR /VIVA | 25%       | 2.5   |

### 8. The Late Twentieth and Twenty-First Centuries (1939-2015)

| Course Code | Course Title                                             | Semester | Credit | Hour |
|-------------|----------------------------------------------------------|----------|--------|------|
| 5B08ENG     | The Late Twentieth and Twenty-First Centuries(1939-2018) | V        | 5      | 6    |

#### Course Outcomes

- ▣ 1. Understand the cultural, political, and stylistic protocols of post-modernism and the various literary movements
- ▣ 2. Understand and apply the basics of the various reading strategies that emerged during the period
- ▣ 3. Read specimens of major works belonging to the period.

#### Content Specifications

**Historical Overview:** Post-War Britain-Social, Political and Economic Change-The Welfare State- Culture and Identity- Belief and Thought-

**Literary Overview:** Literature and the Second World War- Realism, Modernism, Post-Modernism- The Twenty-First Century Novel- Post-Colonial English Writing- Modes of Production and Consumption during the Period- English Language- Post-Modern Fiction- Political Drama- Poetry and Diversity- Environmental Concerns- Class, Culture and Society- Gender and Sexuality- Empire, Race and National Identity- Select Texts of the Period.

#### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

#### CONTINUOUS INTERNAL ASSESSMENT

| COMPONENT                    | WEIGHTAGE | MARKS |
|------------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER     | 50%       | 5     |
| COMPONENT 2<br>ASSIGNMENT    | 25%       | 2.5   |
| COMPONENT 3<br>SEMINAR /VIVA | 25%       | 2.5   |



## 9. Postcolonial Literatures in English

| Course Code | Course Title                        | Semester | Credit | Hour |
|-------------|-------------------------------------|----------|--------|------|
| 5B09ENG     | Postcolonial Literatures in English | V        | 5      | 6    |

### Course Outcomes

- ▣ 1. Understand the meaning, scope and issues related to the term postcolonial.
- ▣ 2. Read specimens of major works belonging to the genre.
- ▣ 3. Familiarise with the cardinal concepts of postcolonial theory.

### Content Specifications

**Historical Overview:** The British Empire- Orientalism- Motifs of the Empire- Maritime Power- Multiple Empires- The Scramble for Africa- Decolonisation- Neo-Colonialism-

**Literary Overview:** Defining Postcolonial Literature- Types of Colonies- Local Cultures- Modernism, Christianity and the Bible- Writing Back- Canon- Select Texts from Postcolonial Writings.

### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

### CONTINUOUS INTERNAL ASSESSMENT

| COMPONENT                    | WEIGHTAGE | MARKS |
|------------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER     | 50%       | 5     |
| COMPONENT 2<br>ASSIGNMENT    | 25%       | 2.5   |
| COMPONENT 3<br>SEMINAR /VIVA | 25%       | 2.5   |

**10. Linguistics**

| Course Code | Course Title | Semester | Credit | Hour |
|-------------|--------------|----------|--------|------|
| 5B10ENG     | Linguistics  | V        | 4      | 5    |

**Course Outcomes**

- ☐ 1. Learn the theories regarding origin, development and history of languages.
- ☐ 2. Familiarise with the cardinal concepts related to “linguistics”.
- ☐ 3. Understand the modern directions in linguistic studies.

**EVALUATION**

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

**CONTINUOUS INTERNAL ASSESSMENT**

| COMPONENT                    | WEIGHTAGE | MARKS |
|------------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER     | 50%       | 5     |
| COMPONENT 2<br>ASSIGNMENT    | 25%       | 2.5   |
| COMPONENT 3<br>SEMINAR /VIVA | 25%       | 2.5   |

**11. Project**

|             |              |          |        |      |
|-------------|--------------|----------|--------|------|
| Course Code | Course Title | Semester | Credit | Hour |
| 6B11ENG     | Project      | VI       | 2      | 1    |

**Course Outcomes**

- 1. Learn and apply specific documentation styles and methodological formalities.
- 2. Critically engage with a literary theme or topic.
- 3. Understand the basic formalities regarding research in humanities.

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|-------------------|------------------|--------------|
| EXTERNAL          | 75%              | 20           |
| INTERNAL          | 25%              | 5            |

## 12. Critical Theory

| Course Code | Course Title    | Semester | Credit | Hour |
|-------------|-----------------|----------|--------|------|
| 6B12ENG     | Critical Theory | VI       | 5      | 6    |

### Course Outcomes

- ☐ 1. Understand the basics of various theoretical positions in literary and culture studies.
- ☐ 2. Apply specific theoretical insights into the study of specific works of art as well as cultural articulations.
- ☐ 3. Understand the ideological assumptions underlying common-sense notions and canon formation.

### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

### CONTINUOUS INTERNAL ASSESSMENT

| COMPONENT                    | WEIGHTAGE | MARKS |
|------------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER     | 50%       | 5     |
| COMPONENT 2<br>ASSIGNMENT    | 25%       | 2.5   |
| COMPONENT 3<br>SEMINAR /VIVA | 25%       | 2.5   |

### 13. Women's Writing

| Course Code | Course Title    | Semester | Credit | Hour |
|-------------|-----------------|----------|--------|------|
| 6B13ENG     | Women's Writing | VI       | 4      | 5    |

#### Course Outcomes

- ☐ 1. Understand women's writing as a specific genre.
- ☐ 2. Appreciate the variety in women's literature and the correlation between such variety and specific socio-political contexts.
- ☐ 3. Understand the various dialogic positions within women's writing.

#### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

#### CONTINUOUS INTERNAL ASSESSMENT

| COMPONENT                    | WEIGHTAGE | MARKS |
|------------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER     | 50%       | 5     |
| COMPONENT 2<br>ASSIGNMENT    | 25%       | 2.5   |
| COMPONENT 3<br>SEMINAR /VIVA | 25%       | 2.5   |

## 14. Indian Writing in English

| Course Code | Course Title              | Semester | Credit | Hour |
|-------------|---------------------------|----------|--------|------|
| 6B14ENG     | Indian Writing in English | VI       | 3      | 4    |

### Course Outcomes

- ☐ 1. Understand Indian Writing in English as a specific genre based on certain common socio-political contexts.
- ☐ 2. Understand the various dialogic positions within Indian Writing in English.
- ☐ 3. Understand the regional diversities and thematic plurality of IWE.

### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

### CONTINUOUS INTERNAL ASSESSMENT

| COMPONENT                    | WEIGHTAGE | MARKS |
|------------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER     | 50%       | 5     |
| COMPONENT 2<br>ASSIGNMENT    | 25%       | 2.5   |
| COMPONENT 3<br>SEMINAR /VIVA | 25%       | 2.5   |

## 15. Film Studies

| Course Code | Course Title | Semester | Credit | Hour |
|-------------|--------------|----------|--------|------|
|-------------|--------------|----------|--------|------|

|         |              |    |   |   |
|---------|--------------|----|---|---|
| 6B15ENG | Film Studies | VI | 4 | 5 |
|---------|--------------|----|---|---|

### **Course Outcomes**

- ▣ 1. Learn the basic terminology, technical aspects, and the major movements in the history of cinema.
- ▣ 2. Watch select movies and analyse them with an eye on technical, thematic and socio-political aspects.
- ▣ 3. Develop basic knowledge and familiarity with the various trends in Indian cinema.

### **EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|-------------------|------------------|--------------|
| EXTERNAL          | 80 %             | 40           |
| INTERNAL          | 20%              | 10           |

### **CONTINUOUS INTERNAL ASSESSMENT**

| <b>COMPONENT</b>             | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|------------------------------|------------------|--------------|
| COMPONENT1<br>TEST PAPER     | 50%              | 5            |
| COMPONENT 2<br>ASSIGNMENT    | 25%              | 2.5          |
| COMPONENT 3<br>SEMINAR /VIVA | 25%              | 2.5          |

### **(DISCIPLINE SPECIFIC ELECTIVE COURSES)**

| <b>Sem.</b> | <b>Course Code</b> | <b>Title of the Course</b> | <b>H/W</b> | <b>Credits</b> |
|-------------|--------------------|----------------------------|------------|----------------|
|             |                    |                            |            |                |

|   |            |                                 |   |   |
|---|------------|---------------------------------|---|---|
| 6 | 6B16 ENG-A | World Literature in Translation | 4 | 4 |
| 6 | 6B16 ENG-B | Indian Writing in Translation   | 4 | 4 |
| 6 | 6B16 ENG-C | Writing for Media               | 4 | 4 |

### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 80 %      | 40    |
| INTERNAL   | 20%       | 10    |

### CONTINUOUS INTERNAL ASSESSMENT

| COMPONENT                    | WEIGHTAGE | MARKS |
|------------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER     | 50%       | 5     |
| COMPONENT 2<br>ASSIGNMENT    | 25%       | 2.5   |
| COMPONENT 3<br>SEMINAR /VIVA | 25%       | 2.5   |

### PART– 3 (GENERIC ELECTIVE COURSES IN ENGLISH)

| Semester | Course Code | Name of the Course            | H/W | Credits | EXAM HRS |
|----------|-------------|-------------------------------|-----|---------|----------|
| 5        | 5D01 ENG    | English for Competitive Exams | 2   | 2       | 2        |
| 5        | 5D02 ENG    | Film Studies                  | 2   | 2       | 2        |



|   |          |                       |   |   |   |
|---|----------|-----------------------|---|---|---|
| 5 | 5D03 ENG | Theatre Studies       | 2 | 2 | 2 |
| 5 | 5D04 ENG | Visual Arts           | 2 | 2 | 2 |
| 5 | 5D05 ENG | Sports Studies        | 2 | 2 | 2 |
| 5 | 5D06 ENG | Regional History      | 2 | 2 | 2 |
| 5 | 5D07 ENG | Philosophy of Science | 2 | 2 | 2 |
| 5 | 5D08 ENG | Gender Studies        | 2 | 2 | 2 |

### EVALUATION

| ASSESSMENT | WEIGHTAGE | MARKS |
|------------|-----------|-------|
| EXTERNAL   | 75%       | 20    |
| INTERNAL   | 25%       | 5     |

### CONTINUOUS INTERNAL ASSESSMENT

| COMPONENT                 | WEIGHTAGE | MARKS |
|---------------------------|-----------|-------|
| COMPONENT1<br>TEST PAPER  | 50%       | 2.5   |
| COMPONENT 2<br>ASSIGNMENT | 50%       | 2.5   |

**TOTAL CREDITS =**

**60** (Part 1 Core) + **4** (Part 2 Complimentary Elective Courses) + **2** (Part 3 Generic Elective Courses) =  
**66 Credits**

**TOTAL HOURS**

= **74** (Part 1 Core) + **4** (Part 2 Complimentary Elective Courses) + **2** (Generic Elective Courses) = **80 Hrs.**



**KANNUR UNIVERSITY**  
(Abstract)

**B.Sc. Computer Science** Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

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No.Acad.C2/12371/2019 Academic Branch  
Civil Station P.O, Dated 21/06/2019

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- Read:-
1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
  2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
  3. U.O No.Acad.C2/429/2017 Vol.II dated 03-06-2019
  4. The Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 07-06-2019
  5. Syllabus of B.Sc. Computer Science submitted by the Chairperson, Board of Studies in Computer Science (UG) dated 13/06/2019

**ORDER**

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.
2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies, Workshops, discussions etc.
3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.
4. Subsequently, as per paper read (4) above, the Board of Studies in Computer Science (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc.Computer Science Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Computer Science (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc Computer Science Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) of B.Sc. Computer Science programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to report before the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.Sc.Computer Science Programme are uploaded in the University website (www.kannuruniversity.ac.in)


Orders are issued accordingly.

Sd/-  
DEPUTY REGISTRAR (ACADEMIC)  
for REGISTRAR

To  
The Principals of Colleges offering B.Sc. Computer Science Programme

Copy to:-  
1. The Examination Branch (through PA to CE)  
2. The Chairperson, Board of Studies in Computer Science (UG)  
3. PS to VC/PA to PVC/PA to Registrar  
4. DR/AR-I, Academic  
5. The Computer Programmer (for uploading in the website)  
6. SF/DF/FC

Forwarded/By Order

  
SECTION OFFICER





# **KANNUR UNIVERSITY**

**BOARD OF STUDIES-COMPUTER SCIENCE(UG)**

***SYLLABUS FOR B.SC. COMPUTER SCIENCE CORE,  
COMPLEMENTARY ELECTIVE COURSE FOR  
B.SC. MATHEMATICS/STATISTICS/PHYSICS/  
ELECTRONICS PROGRAMMES AND  
GENERIC ELECTIVE COURSES***

**CHOICE BASED CREDIT AND SEMESTER SYSTEM  
(OBE-Outcome Based Education System)**

**(2019 ADMISSION ONWARDS)**

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**Kannur University**  
**Vision and Mission Statement**

**Vision:** To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manantavadytaluk of Wayanad Revenue District”

**Mission:**

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region’s intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

# **KANNUR UNIVERSITY**

## **Programme Outcomes (PO)**

### **PO 1. Critical Thinking:**

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

### **PO 2. Effective Citizenship:**

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.
3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

### **PO 3. Effective Communication:**

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

### **PO 4. Interdisciplinarity:**

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

## **PREFACE**

Technological innovations have redefined the traditional concepts of education, profession and lifestyles in the contemporary scenario. Computer Systems are a part of every aspect of prevalent culture from home video game consoles to hospital monitoring equipment. Computer scientists design, build and improve these systems, finding new applications for sophisticated technology. India has been one of the leading exporters of IT talent and Indian computer professionals have played major role in the growth and development of IT sector in various countries.

The Board of Studies in Computer Science travails to offer students with a solid technological foundation through the reformed curriculum for undergraduate programme of Kannur University. The curriculum aims at developing technical caliber among students through academic explorations in the classroom, extended academic activities like seminars, workshops and conferences. Formative and summative assessments will absolutely be in tune with the learning outcomes and the instructional strategies.

In this era of unprecedented technological developments, the Board of Studies in Computer Science of Kannur University substantially emphasizes employment-based curriculum to empower the students with refined technical competence. This curriculum categorically states the graduate attributes / outcomes and has been developed after various workshops and academic deliberations with different stakeholders at various levels. The Board of Studies in Computer Science has resolved to introduce the syllabus for UG Programme in the affiliated colleges from 2019 admission onwards and I would like to place on record my gratefulness to the members of the Board of Studies, faculty and stakeholders for having helped me in the formulation of this syllabus.

Lt. Thomas Scaria

Chairperson

Board of Studies, Computer Science (UG)  
Kannur University

**KANNUR UNIVERSITY**

**Programme Specific Outcome of B.Sc. Computer Science Programme**

|      |                                                                                                                                          |
|------|------------------------------------------------------------------------------------------------------------------------------------------|
| PSO1 | Understand the concepts of Computer Science and Applications.                                                                            |
| PSO2 | Understand the concepts of System Software and Application Software.                                                                     |
| PSO3 | Understand the concepts of Algorithms and Programming.                                                                                   |
| PSO4 | Understand the concepts of Computer Networks and Operating Systems                                                                       |
| PSO5 | Design, develop, implement and test software systems to meet the given specifications, following the principles of Software Engineering. |

| ITEM                                                                                                                                                 | PAGE NO:  |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>BSC COMPUTER SCIENCE PROGRAMME- WORK AND CREDIT DISTRIBUTION STATEMENT</b>                                                                        | <b>6</b>  |
| <b>PART A:</b><br><b>BSC COMPUTER SCIENCE CORE COURSES- WORK AND CREDIT STATEMENT &amp; SYLLABUS</b>                                                 | <b>8</b>  |
| <b>PART B:</b><br><b>BSC COMPUTER SCIENCE COMPLEMENTARY ELECTIVE COURSES- WORK AND CREDIT STATEMENT &amp; SYLLABUS</b>                               | <b>63</b> |
| <b>PART C:</b><br><b>BSC COMPUTER SCIENCE GENERIC ELECTIVE COURSES- WORK AND CREDIT STATEMENT &amp; SYLLABUS (FOR STUDENTS OF OTHER DEPARTMENTS)</b> | <b>76</b> |



**KANNUR UNIVERSITY**

**BSC COMPUTER SCIENCE PROGRAMME**

**WORK AND CREDIT DISTRIBUTION STATEMENT**

| <b>Semester</b> | <b>Course Title*</b>                                             | <b>Credits</b> | <b>Hours per week</b> | <b>Total Credits</b> | <b>Total Hours</b> |
|-----------------|------------------------------------------------------------------|----------------|-----------------------|----------------------|--------------------|
| <b>I</b>        | Common Course – English I                                        | 4              | 5                     | 18                   | 25                 |
|                 | Common Course – English II                                       | 3              | 4                     |                      |                    |
|                 | Common Course – Additional Language I                            | 4              | 5                     |                      |                    |
|                 | Core Course I – 1B01CSC Introduction to C Programming            | 2              | 1                     |                      |                    |
|                 | Core Course III – 2B03CSC Lab 1: C Programming*                  | 0              | 2                     |                      |                    |
|                 | Complementary Elective I (Mathematics /Statistics)               | 3              | 4                     |                      |                    |
|                 | Complementary Elective II (Physics)                              | 2              | 2                     |                      |                    |
|                 | Complementary Elective II (Physics- Practical)                   | -              | 2                     |                      |                    |
| <b>II</b>       | Common Course – English III                                      | 4              | 5                     | 20                   | 25                 |
|                 | Common Course – English IV                                       | 3              | 4                     |                      |                    |
|                 | Common Course – Additional Language II                           | 4              | 5                     |                      |                    |
|                 | Core Course II – 2B02CSC Advanced C Programming                  | 2              | 1                     |                      |                    |
|                 | Core Course III – 2B03CSC Lab 1: C Programming*                  | 2              | 2                     |                      |                    |
|                 | Complementary Elective I (Mathematics /Statistics)               | 3              | 4                     |                      |                    |
|                 | Complementary Elective II (Physics)                              | 2              | 2                     |                      |                    |
|                 | Complementary Elective II (Physics- Practical)                   | -              | 2                     |                      |                    |
| <b>III</b>      | General Awareness Course I – 3A11CSC Programming in C++          | 3              | 3                     | 15                   | 25                 |
|                 | General Awareness Course II – 3A12CSC Database Management System | 3              | 3                     |                      |                    |
|                 | Core Course IV – 3B04CSC Data Structures                         | 4              | 4                     |                      |                    |
|                 | Core Course VI – 4B06CSC Lab II: Data Structures Using C++**     | 0              | 3                     |                      |                    |
|                 | Core Course VII – 4B07CSC Lab III: Database Management System**  | 0              | 2                     |                      |                    |
|                 | Complementary Elective I (Mathematics /Statistics)               | 3              | 5                     |                      |                    |
|                 | Complementary Elective II (Physics)                              | 2              | 3                     |                      |                    |
|                 | Complementary Elective II (Physics- Practical)                   | -              | 2                     |                      |                    |

|       |                                                                               |   |   |     |     |
|-------|-------------------------------------------------------------------------------|---|---|-----|-----|
| IV    | General Awareness Course III – 4A13CSC<br>Digital Electronics                 | 3 | 3 | 24  | 25  |
|       | General Awareness Course IV – 4A14CSC<br>Operating Systems                    | 3 | 3 |     |     |
|       | Core Course V – 4B05CSC Software<br>Engineering                               | 4 | 4 |     |     |
|       | Core Course VI – 4B06CSC Lab II: Data<br>Structures Using C++**               | 3 | 3 |     |     |
|       | Core Course VII – 4B07CSC Lab III: Database<br>Management System**            | 2 | 2 |     |     |
|       | Complementary Elective I (Mathematics<br>/Statistics)                         | 3 | 5 |     |     |
|       | Complementary Elective II (Physics)                                           | 2 | 3 |     |     |
|       | Complementary Elective II (Physics- Practical)                                | 4 | 2 |     |     |
| V     | Core Course VIII – 5B08CSC Web<br>Technology                                  | 4 | 4 | 17  | 25  |
|       | Core Course IX – 5B09CSC Java<br>Programming                                  | 4 | 4 |     |     |
|       | Core Course X – 5B10CSC Computation<br>Using Python                           | 3 | 3 |     |     |
|       | Core Course XI – 5B11CSC- Discipline<br>Specific Elective I                   | 4 | 4 |     |     |
|       | Core Course XVI – 6B16CSC Lab IV: Java<br>Programming***                      | 0 | 4 |     |     |
|       | Core Course XVII – 6B17CSC Lab V: Web<br>Technology and Python Programming*** | 0 | 4 |     |     |
|       | General Elective Course                                                       | 2 | 2 |     |     |
| VI    | Core Course XII – 6B12CSC Computer<br>Networks                                | 4 | 4 | 26  | 25  |
|       | Core Course XIII – 6B13CSC Compiler<br>Design                                 | 4 | 4 |     |     |
|       | Core Course XIV – 6B14CSC Computer<br>Organization                            | 3 | 3 |     |     |
|       | Core Course XV – 6B15CSC- Discipline<br>Specific Elective II                  | 4 | 4 |     |     |
|       | Core Course XVI – 6B16CSC Lab IV: Java<br>Programming***                      | 3 | 2 |     |     |
|       | Core Course XVII – 6B17CSC Lab V: Web<br>Technology and Python Programming*** | 3 | 2 |     |     |
|       | Core Course XVIII – 6B18CSC Project                                           | 5 | 6 |     |     |
| Total |                                                                               |   |   | 120 | 150 |

Total Marks of the Programme – 1750 Marks (Eng-200 Marks, Additional Common Course 100 Marks, Core 1050 Marks, First Complementary Elective 200 Marks and Second Complementary Elective -200 Marks)

\*External examination will be conducted at the end of second semester

\*\*External examination will be conducted at the end of fourth semester

\*\*\*External examination will be conducted at the end of sixth semester

First Complementary Elective: Mathematics/Statistics

Second Complementary Elective: Physics

**PART A**

**B.SC. COMPUTER SCIENCE CORE COURSES**  
**WORK AND CREDIT DISTRIBUTION**

**(2019 ADMISSION ONWARDS)**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                        | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> | <b>MARKS<sup>(INTERNAL + EXTERNAL)</sup></b> |
|--------------------|--------------------------------------------|-----------------|-----------------------|---------------|-----------------|----------------------------------------------|
| 1B01CSC            | INTRODUCTION TO C PROGRAMMING              | 1               | 1                     | 2             | 3               | 10+40                                        |
| 2B03CSC            | LAB I: C PROGRAMMING                       | 1               | 2                     | 0             | -               | -                                            |
| 2B02CSC            | ADVANCED C PROGRAMMING                     | 2               | 1                     | 2             | 3               | 10+40                                        |
| 2B03CSC            | LAB I: C PROGRAMMING                       | 2               | 2                     | 2             | 3               | 5+20                                         |
| 3A11CSC            | PROGRAMMING IN C++                         | 3               | 3                     | 3             | 3               | 10+40                                        |
| 3A12CSC            | DATABASE MANAGEMENT SYSTEM                 | 3               | 3                     | 3             | 3               | 10+40                                        |
| 3B04CSC            | DATA STRUCTURES                            | 3               | 4                     | 4             | 3               | 10+40                                        |
| 4B06CSC            | LAB II: DATA STRUCTURES USING C++          | 3               | 3                     | 0             | -               | -                                            |
| 4B07CSC            | LAB III: DATABASE MANAGEMENT SYSTEM        | 3               | 2                     | 0             | -               | -                                            |
| 4A13CSC            | DIGITAL ELECTRONICS                        | 4               | 3                     | 3             | 3               | 10+40                                        |
| 4A14CSC            | OPERATING SYSTEMS                          | 4               | 3                     | 3             | 3               | 10+40                                        |
| 4B05CSC            | SOFTWARE ENGINEERING                       | 4               | 4                     | 4             | 3               | 10+40                                        |
| 4B06CSC            | LAB II: DATA STRUCTURES USING C++          | 4               | 3                     | 3             | 3               | 5+20                                         |
| 4B07CSC            | LAB III: DATABASE MANAGEMENT SYSTEM        | 4               | 2                     | 2             | 3               | 5+20                                         |
| 5B08CSC            | WEB TECHNOLOGY                             | 5               | 4                     | 4             | 3               | 10+40                                        |
| 5B09CSC            | JAVA PROGRAMMING                           | 5               | 4                     | 4             | 3               | 10+40                                        |
| 5B10CSC            | COMPUTATION USING PYTHON                   | 5               | 3                     | 3             | 3               | 10+40                                        |
| 5B11CSC            | DISCIPLINE SPECIFIC ELECTIVE I             | 5               | 4                     | 4             | 3               | 10+40                                        |
| 5D--CSC            | GENERIC ELECTIVE COURSE                    | 5               | 2                     | 2             | 2               | 5+20                                         |
| 6B16CSC            | LAB IV: JAVA PROGRAMMING                   | 5               | 4                     | 0             | -               | -                                            |
| 6B17CSC            | LAB V: WEB TECHNOLOGY & PYTHON PROGRAMMING | 5               | 4                     | 0             | -               | -                                            |
| 6B12CSC            | DATA COMMUNICATION AND COMPUTER NETWORKING | 6               | 4                     | 4             | 3               | 10+40                                        |

|                                                                       |                                            |   |   |   |   |       |
|-----------------------------------------------------------------------|--------------------------------------------|---|---|---|---|-------|
| 6B13CSC                                                               | COMPILER DESIGN                            | 6 | 4 | 4 | 3 | 10+40 |
| 6B14CSC                                                               | COMPUTER ORGANIZATION                      | 6 | 3 | 3 | 3 | 10+40 |
| 6B15CSC                                                               | DISCIPLINE SPECIFIC ELECTIVE II            | 6 | 4 | 4 | 3 | 10+40 |
| 6B16CSC                                                               | LAB IV: JAVA PROGRAMMING                   | 6 | 2 | 3 | 3 | 5+20  |
| 6B17CSC                                                               | LAB V: WEB TECHNOLOGY & PYTHON PROGRAMMING | 6 | 2 | 3 | 3 | 5+20  |
| 6B18CSC                                                               | PROJECT*                                   | 6 | 6 | 5 | - | 20+80 |
| *AN INDUSTRIAL VISIT (STUDY TOUR) IS RECOMMENDED FOR THE PROJECT WORK |                                            |   |   |   |   |       |

**TOTAL MARKS OF CORE COURSES 1050**

**LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES**

| COURSE CODE | COURSE TITLE         | SEMESTER | HOURS PER WEEK | CREDIT | EXAM HRS |
|-------------|----------------------|----------|----------------|--------|----------|
| 5B11CSC-A   | ALGORITHM DESIGNING  | 5        | 4              | 4      | 3        |
| 5B11CSC-B   | LINUX ADMINISTRATION | 5        | 4              | 4      | 3        |
| 5B11CSC-C   | COMPUTER GRAPHICS    | 5        | 4              | 4;     | 3        |
| 6B15CSC-A   | INFORMATION SECURITY | 6        | 4              | 4      | 3        |
| 6B15CSC-B   | DATA MINING          | 6        | 4              | 4      | 3        |
| 6B15CSC-C   | BIO-INFORMATICS      | 6        | 4              | 4      | 3        |

**EVALUATION**

| ASSESSMENT | WEIGHTAGE |
|------------|-----------|
| EXTERNAL   | 80%       |
| INTERNAL   | 20%       |

**CONTINUOUS EVALUATION FOR THEORY**

| COMPONENT           | WEIGHTAGE | REMARKS                                                                                                                                                |
|---------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| COMPONENT1:<br>TEST | 80%       | MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE MARKS OBTAINED IN THE TESTS CONDUCTED. |

|                                             |     |                   |
|---------------------------------------------|-----|-------------------|
| COMPONENT 2:<br>ASSIGNMENT/<br>SEMINAR/VIVA | 20% | ANY ONE COMPONENT |
|---------------------------------------------|-----|-------------------|

**PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION**

|                                         |                        |                                         |
|-----------------------------------------|------------------------|-----------------------------------------|
| <b>Part A</b>                           | <b>Short Answer</b>    | <b>6 Questions x 1 Mark = 6 Marks</b>   |
|                                         | Answer all questions   | 6 Questions x 1 Mark = 6 Marks          |
| <b>Part B</b>                           | <b>Short Essay</b>     | <b>8 Questions x 2 Marks = 16 Marks</b> |
|                                         | Answer any 6 questions | 6 Questions x 2 Marks = 12 Marks        |
| <b>Part C</b>                           | <b>Essay</b>           | <b>6 Questions x 3 Marks = 18 Marks</b> |
|                                         | Answer any 4 questions | 4 Questions x 3 Marks = 12 Marks        |
| <b>Part D</b>                           | <b>Long Essay</b>      | <b>4 Questions x 5 Marks = 20 Marks</b> |
|                                         | Answer any 2 questions | 2 Questions x 5 Marks = 10 Marks        |
| <b>Total Marks Including Choice: 60</b> |                        |                                         |
| <b>Maximum Marks for the Course: 40</b> |                        |                                         |

**CONTINUOUS EVALUATION FOR PRACTICAL**

| <b>COMPONENT</b>                                                      | <b>WEIGHTAGE</b>                                                          | <b>REMARKS</b>                                                                                                         |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| COMPONENT 1:<br>LAB SKILLS,<br>OBSERVATION<br>NOTE AND<br>PUNCTUALITY | 20% FOR LAB<br>SKILL<br>20% FOR<br>OBSERVATION<br>NOTE AND<br>PUNCTUALITY | OBSERVATION NOTE IS MANDATORY.<br>MARKS SHOULD BE GIVEN<br>CONSIDERING OBSERVATION NOTE<br>LAB SKILLS AND PUNCTUALITY. |
| COMPONENT 1:<br>TEST                                                  | 60%                                                                       | MODEL EXAMINATION SHOULD BE<br>CONDUCTED BEFORE EXTERNAL<br>EXAM AND CONSIDERED FOR<br>INTERNAL MARK                   |

## END SEMESTER EVALUATION FOR PRACTICAL

\*EXCEPT : 2B03CSC ADVANCED C PROGRAMMING - LAB

| COMPONENT                         | PART A    | PART B |
|-----------------------------------|-----------|--------|
| Code Writing                      | 3         | 3      |
| Output                            | 3         | 3      |
| Modification for Part A or Part B | 3         |        |
| Record                            | 2         |        |
| Viva                              | 3         |        |
| <b>Total Marks</b>                | <b>20</b> |        |

### PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION- PRACTICAL

|                                         |                                         |                                  |
|-----------------------------------------|-----------------------------------------|----------------------------------|
| <b>Part A</b>                           | <b>2 Questions x 10 Mark = 20 Marks</b> |                                  |
|                                         | Answer any 1 question                   | 1 Questions x 10 Mark = 10 Marks |
| <b>Part B</b>                           | <b>2 Questions x 10 Mark = 20 Marks</b> |                                  |
|                                         | Answer any 1 question                   | 1 Questions x 10 Mark = 10 Marks |
| <b>Total Marks Including Choice: 40</b> |                                         |                                  |
| <b>Maximum Marks for the Course: 20</b> |                                         |                                  |

### SEMINARS/ASSIGNMENTS/VIVA

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

### RECORDS

One rough record (Observation Note) and one fair record are compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works. Record mark is calculated at the time of End Semester Evaluation. Observation notes are compulsory in Lab hours. Students should get signature for each program done in the lab from the faculties and those programs are recommended for fair record.

## **PROJECT WORK**

Every student of B.Sc. Computer Science Programme shall have to work on a project of FIVE credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation at the end of sixth semester. Individual projects are recommended but, in an instance, where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to THREE.

### **PROJECT EVALUATION**

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. Assessment of different components may be taken as below.

### **CONTINUOUS EVALUATION FOR PROJECT**

| <b>COMPONENT</b>                                   | <b>WEIGHTAGE</b> |
|----------------------------------------------------|------------------|
| Punctuality                                        | 20%              |
| Relevance of topic System study / Design of tables | 20%              |
| Project Report                                     | 30%              |
| Presentation & Viva-voce                           | 30%              |
| <b>Total</b>                                       | <b>100%</b>      |

### **END SEMESTER EVALUATION FOR PROJECT**

| <b>COMPONENT</b>                                                 | <b>WEIGHTAGE</b> |
|------------------------------------------------------------------|------------------|
| Written Synopsis/Abstract                                        | 12.5%            |
| Content of the Project                                           | 12.5%            |
| Quality of project work/Use of software/ tools                   | 12.5%            |
| Perfection of the work (Designs of tables/ Input & Output forms) | 25%              |
| Live demo                                                        | 12.5%            |
| Viva-voce                                                        | 25%              |
| <b>Total</b>                                                     | <b>100%</b>      |

## CORE COURSE I: 1B01CSC INTRODUCTION TO C PROGRAMMING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 1        | 1B01CSC     | 1              | 2      | 3        |

### COURSE OUTCOME

**CO1:** Aware about basics of programming.

**CO2:** Capable to analyze the problem and design algorithm and flowchart.

**CO3:** Familiar the basics of high-level language – C.

**CO4:** Able to develop efficient and error free programs in C.

#### **Unit I:**

Computer Programming and Languages: Introduction, Developing a Program, Program Development Cycle, Algorithm, Flowchart: Flowchart Symbols, Guidelines for Preparing Flowcharts, Benefits of Flowcharts, Limitations of Flowcharts, Examples of Algorithm and Flowchart. [Text Book 1]

**(5 Hrs)**

#### **Unit II:**

Overview of C: History of C, Importance of C, Basic Structure of C Programming Style, Executing a C program, Source Code, Object Code, Executable File, File Extensions, Character Set, C Tokens - Keywords, Identifiers, Constants, Variables, Data Types, Declaration of Variables, Assigning Values to Variables, Reading Data from Keyboard, Operators and Expressions: Arithmetic Operator, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operator, Bitwise Operator, Special Operators,. Arithmetic Expressions, Precedence of Arithmetic Operators, Type Conversion in Expressions.

**(5 Hrs)**

#### **Unit III:**

Managing Input Output Operation: Reading a Character, Writing a Character, Formatted Input, Formatted Output. Decision Making and Branching: Decision Making with if Statement - Simple if, if - else, Nested if - else, else if Ladder, switch Statement, go to Statement, Decision Making and Looping: while, do-while, for Statement, Jumps in Loops - break and continue Statements.

**(4 Hrs)**



**Unit IV:**

Arrays: Introduction, One Dimensional Arrays - Declaration of Arrays, Initialization of Arrays; Two-Dimensional Arrays - Initializing Two-Dimensional Arrays, Multi-Dimensional Array, Handling of Character Strings: Introduction, Declaring and Initializing String Variables, Reading a Line of Text, Writing Strings to Screen, Arithmetic Operations on Characters, String Handling functions: strlen, strcpy, strcmp, strcat, strev.

(4 Hrs)

**Books for Study:**

1. Introduction to information technology IITL Education solutions Limited, second Edition
2. Programming in ANSI C Second Edition – E Balagurusamy – Tata McGraw-Hill Publishing company Limited

**Books for Reference:**

1. Let us C, YeshavantKanetkar, 16<sup>th</sup>Edn, BPB
2. Programming in C, Ashok N Kamthane, Pearson Education
3. Computer Basics and c Programming, V. Rajaraman, PHI, 2008 6
4. Fundamentals of information technology, Dr. S.B Kishor, A.S Khandelwal, 2<sup>nd</sup> Ed, Published by DAS GANU Prakashan.

**Online References:**

1. <http://www.yspuniversity.ac.in/cic/algorithm-manual.pdf>
2. [https://www.it.iitb.ac.in/~vijaya/ssrvvm/dokuwiki/media/s6\\_17\\_20jan.pdf](https://www.it.iitb.ac.in/~vijaya/ssrvvm/dokuwiki/media/s6_17_20jan.pdf)

**Marks Including Choice:**

| Unit | Marks |
|------|-------|
| I    | 14    |
| II   | 14    |
| III  | 16    |
| IV   | 16    |

## CORE COURSE II: 2B02CSC ADVANCED C PROGRAMMING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 2        | 2B02CSC     | 1              | 2      | 3        |

### COURSE OUTCOME

**CO1:** Familiar with advanced concepts of C program.

**CO2:** Capable to work with user defined as well as library functions.

**CO3:** Skilled to solve more complex problems.

**CO4:** Able to develop C programs using structure, union, pointers and files.

#### **Unit I:**

User Defined Functions: Need for User-defined Functions, The Form of C Functions – Function Name, Argument List, Return value and Their Types, Calling a Function, Category of Functions – No Argument and No Return Values, Argument but no Return Values, Arguments with Return Values, Handling of Non-integer Functions, Functions Returning Nothing, Nesting of Functions, Recursion, The Scope and Life-time of Variables in a Function, Automatic Variables, External Variables, Static Variables, Register Variables.

**(5 Hrs)**

#### **Unit II:**

Pointers: Introduction; understanding pointers; Accessing the address of a variable; Declaration and initialization of a pointer; Accessing a variable through its pointer; Pointer expressions; Pointer increments and scale factor; Pointers and Arrays; Pointers and Functions – pointers as function arguments, pointers to functions; pointers and structures.

**(4 Hrs)**

#### **Unit III:**

Structures and Unions: Structure Definition; Giving values to members; Structure initialization; Comparison of structure variables; Arrays of Structures; Arrays within Structures; Structures within Structures; Unions; Dynamic Memory Allocation: Memory allocation process; Allocating a block of memory; Allocating multiple blocks of memory; Releasing the used space, Altering the size of a block.

**(4 Hrs)**

**Unit IV:**

File Management in C: Introduction; Defining and Opening a File; Closing a file; Input/output operations on files – the getc and putc functions; getw and putw functions; fprintf and fscanf functions; Error handling during I/O operations; Random Access to Files; Command line arguments; The preprocessor: Macro substitution-simple macro substitution; Macros with arguments; Nesting of macros; Undefined a macro; File inclusion.

(5 Hrs)

**Books for Study:**

1. Programming in ANSI C Second Edition – E Balagurusamy – Tata McGraw-Hill Publishing company Limited

**Books for Reference:**

1. Let us C, Yeshavant Kanetkar, 3rd Edn, BPB
2. Programming in C, Ashok N Kamthane, Pearson Education
3. Programming using C, Dr. S.B Kishor, 2<sup>nd</sup> Ed, DAS GANU Prakashan.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 17    |
| II   | 13    |
| III  | 13    |
| IV   | 17    |

### CORE COURSE III: 2B03CSC ADVANCED C PROGRAMMING - LAB

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 2        | 2B03CSC     | 2*             | 2      | 3        |

\*Lab will be conducted for 2 hours each in I and II Semesters

#### Part A

##### **Conditional operator**

1. Write a program to print largest among three numbers

##### **sizeof operator**

2. Write a program to print the size of built in data types.

##### **else if**

3. Write a program to check whether the given number is odd or even
4. Write a program to find the roots of a quadratic equation

##### **else if ladder**

5. Write a program to print grade of students
6. Write a program to count number of vowels, consonants and spaces in a line of text.

##### **switch**

7. Write a program to accept two numbers and perform various arithmetic operations (+, -, \*, /) based on the symbol entered.

##### **while**

8. Write a program to check whether the given number is Armstrong number or not.
9. Write a program to print Fibonacci series up to a given number.

##### **do-while**

10. Write a program to print multiplication table for the given number

##### **for**

11. Write a program to print prime numbers within range.
12. Write a program to convert decimal number to its binary equivalent.

## **Part B**

### **Array**

13. Write a program to perform Matrix multiplication

### **String**

14. Write a program to check whether the given string is palindrome or not
15. Write a program to implement 5 string handling functions

### **Function**

16. Write a program to print transpose of a given matrix

### **Recursive function**

17. Write a program to find the factorial of a given number.
18. Write a program to print sum of n natural numbers

### **Pointers**

19. Write a program to swap two numbers using pointers

### **Pointers and function**

20. Write a program to access the elements of an array using function pointer

### **Structure**

21. Write a program to add two complex numbers using structure
22. Write a program to calculate and display the Gross\_salary and Net\_salary of employees working in a retail medical shop if their Basic, DA, TA, other allowances and deductions are given.

### **File**

23. Write a program to read a line of text from the keyboard and write it to a file.

### **Macros**

24. Write a program to print volume of a triangle using the concept macros with argument.

**DISTRIBUTION OF MARKS FOR END SEMESTER EVALUATION**

| COMPONENT                                | PART A    | PART B |
|------------------------------------------|-----------|--------|
| Code Writing                             | 3         | 3      |
| Output                                   | 3         | 3      |
| Modification for Part A or Part B        | 2         |        |
| Algorithm/Flowchart for part A or Part B | 2         |        |
| Record                                   | 1         |        |
| Viva                                     | 3         |        |
| <b>Total Marks</b>                       | <b>20</b> |        |

**PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION**

|                                         |                                         |                                  |
|-----------------------------------------|-----------------------------------------|----------------------------------|
| <b>Part A</b>                           | <b>2 Questions x 10 Mark = 20 Marks</b> |                                  |
|                                         | Answer any 1 question                   | 1 Questions x 10 Mark = 10 Marks |
| <b>Part B</b>                           | <b>2 Questions x 10 Mark = 20 Marks</b> |                                  |
|                                         | Answer any 1 question                   | 1 Questions x 10 Mark = 10 Marks |
| <b>Total Marks Including Choice: 40</b> |                                         |                                  |
| <b>Maximum Marks for the Course: 20</b> |                                         |                                  |

## GENERAL AWARENESS COURSE I: 3A11CSC PROGRAMMING IN C++

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 3        | 3A11CSC     | 3              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Describe the Object-Oriented Paradigm

**CO2:** Understand dynamic memory management techniques

**CO3:** Analyze a problem and construct a C++ program that solves it

**CO4:** Discover errors in a C++ program and describe how to fix them

#### **Unit I:**

Procedure oriented programming; Object oriented programming; OOP-Concepts, benefits, applications. What is c++? Applications of c++; Structure of C++ program; How to create and execute a C++ program. Reference variables. Extraction and insertion operator, Scope resolution operator, Memory dereferencing and memory management operator. Inline function default arguments; Constant arguments.

**(12Hrs)**

#### **Unit II:**

Specifying a class; Defining member functions making an outside function inline; nesting of member functions. private member functions. arrays within a class arrays of objects; objects as function arguments; returning objects. memory allocation for objects, static data members; static member functions, function overloading, friend functions; local classes. Constructors; default constructors, Parameterized constructors; multiple constructors in a class, constructors with default arguments; copy constructor; Destructors.

**(16Hrs)**

#### **Unit III:**

Operator overloading; overloading unary operators, overloading binary operators, overloading binary operators using friends; rules for overloading operators. Inheritance - defining derived classes, single inheritance; making a private member inheritance; multilevel inheritance, multiple inheritance; hierarchical inheritance; hybrid inheritance; virtual base classes constructors in derived classes; abstract classes; Nesting of classes;

Pointers-Pointers to objects; this pointer, Pointers to derived classes; virtual functions, pure virtual functions.

(14Hrs)

**Unit IV:**

C++ streams; stream classes , unformatted I/O operations; formatted console I/O operations; Managing output with manipulators. Files – classes for file stream operation and their manipulations. Sequential input and output operation updating a file: random access, error handling during file operations.

(12Hrs)

**Books for Study:**

1. Object Oriented Programming with C++; E. Balagurusamy; 3rd Edn; TMH 2006.

**Books for Reference:**

1. K R Venugopal, RajkumarBuyya, “Mastering C++”, Tata McGraw Hill, 2013.
2. Object Oriented Programming with ANSI & Turbo C++, Ashok N. Kamthane, Pearson Education
3. Programming in C++, M.T. Somashekara, Prentice Hall of India, New Delhi
4. Let us C++, YeshawantKanetkar, BPB

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 12    |
| II   | 18    |
| III  | 18    |
| IV   | 12    |



**GENERAL AWARENESS COURSE II: 3A12CSC DATABASE MANAGEMENT SYSTEM**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>3</b>        | <b>3A12CSC</b>     | <b>3</b>              | <b>3</b>      | <b>3</b>        |

**COURSE OUTCOME**

- CO1:** Familiar with organized data collection.
- CO2:** Able to design data bases.
- CO3:** Skilled to normalize the data bases.
- CO4:** Capable to frame queries for various purposes

**Unit I:**

Introduction – purpose of Database systems. View of Data, Data Models, transaction management, database structure, DBA, Data Base Users.

**(10 Hrs)**

**Unit II:**

E-R model, Basic concepts; design issues; Mapping Constraints; Keys; Primary, Foreign, candidate, E-R diagram; Weak entity set; Extended E-R features. Normal forms – 1NF, 2NF, 3NF and BCNF; functional dependency, Normalization.

**(15 Hrs)**

**Unit III:**

SQL: database languages; DDL- create, alter, drop; DML- Insert , Select, update, Delete; DCL ,TCL,SQL Functions, Data types in SQL; Creation and deletion of database and user .Developing queries and sub queries; Join operations in Detail .

**(15 Hrs)**

**Unit IV:**

Integrity constraints, views, Trigger and Sequences, Relational model – Structure of Relational database. Relational Algebra; Fundamental operations; Relational calculus; Tuple and domain calculus.

**(14 Hrs)**

**Books for Study:**

1. Database System Concepts; Silberschatz, Korth and Sudarsan, 5th Edn; McGraw Hill.
2. The Database Book: Principles and Practice Using MySQL; Gehani; University Press.

**Books for Reference:**

1. Fundamentals of Database systems, E. Navathe, 7<sup>th</sup>edn, Pearson Education.
2. Introduction to data base systems ITL Education Solutions Limited
3. DBMS and ORACLE, Dr. S.B Kishor, 2<sup>nd</sup> Ed, DAS GANU Prakashan.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 13    |
| II   | 17    |
| III  | 14    |
| IV   | 16    |

## CORE COURSE IV: 3B04CSC DATA STRUCTURES

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 3        | 3B04CSC     | 4              | 4      | 3        |

### COURSE OUTCOME

**CO1:** Able to analyze the complexity of algorithm.

**CO2:** Familiar with linear and nonlinear data structures.

**CO3:** Acquire the ability to select appropriate data structure for a given problem.

**CO4:** Obtain skill for systematic approach to programming.

#### **Unit I:**

Elementary Data Organization, Data Structures, Data Structure Operations. Classification of Data Structures; Linear Arrays - operations – Application: Polynomial- Representation with arrays; Polynomial addition ; Stack – Operations, Application: Evaluation of post fix expression ; Queue – Operations, Printer Queue as application, Circular Queue, Deque, Priority Queue; Linked Lists: Definition, Representation of Linked List in memory, Traversing Linked List, Searching a linked list, Memory Allocation and Garbage Collection , Insert into a linked list, Deletion from a linked list; Header Linked Lists; Two-way Lists – Operations.

**(20 Hrs)**

#### **Unit II:**

Trees – Binary Trees, Complete Binary trees, Extended Binary trees; Representing Binary trees in memory, Traversing Binary trees, Binary search trees – Searching and inserting in Binary Search Trees, Deleting in a Binary Search Tree, Heap – Heap sort, Huffman’s Algorithm; General Trees – Computer representation of general trees.

**(16 Hrs)**

#### **Unit III:**

Graphs – Graph Theory terminology; Sequential Representation of Graphs – Adjacency Matrix, Path Matrix ; Operations on graph – searching, inserting, deleting, traversing: Breadth- First Search and Depth First Search.

**(16 Hrs)**

**Unit IV:**

Design and Analysis of Algorithms: From Problems to Programs - Algorithms, Pseudo-Language and Stepwise Refinement; Abstract Data Types- Definition of Abstract Data Type, Data Structures and Abstract Data Types; The Running Time of a Program - Measuring the Running Time of a Program, Asymptotic Notations – Big O, Omega, Theta. Search: Linear and Binary search; comparison of searching algorithms. Sort: Insertion, bubble, selection, quick and merge sort; Comparison of Sort algorithms.

(20 Hrs)

**Books for Study:**

1. Schaum's Outline of Theory and Problems of Data Structures – Seymour Lipschutz – Mc-Graw Hill Book Company.
2. Data Structures and Algorithms- Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman – Pearson Education.

**Books for Reference:**

1. Data Structures and Algorithms: Concepts, Techniques and Applications; GAV Pai, McGraw Hill, 2008.
2. Data Structures in C, Achuthsankar and Mahalekshmi, PHI, 2008
3. Fundamentals of Data structures in C++, 2nd Edn, Horowitz Sahni, Anderson, Universities Press
4. Classic Data structures, Samanta, Second Edition, PHI

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 19    |
| II   | 11    |
| III  | 11    |
| IV   | 19    |

**GENERAL AWARENESS COURSE III: 4A13CSC DIGITAL ELECTRONICS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>4</b>        | <b>4A13CSC</b>     | <b>3</b>                  | <b>3</b>      | <b>3</b>            |

**COURSE OUTCOME**

**CO1:** Introduce the basic and important concepts of Digital Principles and Applications.

**CO2:** Familiarize with basic building blocks of Digital systems, Digital Logic and Digital Circuits.

**CO3:** Design simple combinational digital systems.

**CO4:** Familiarize different number systems, codes and data representation.

**Unit I:**

Digital Concepts: Digital and Analog Quantities – Binary Digits, Logic Levels and Digital Waveforms - Basic Logic – Number Systems: Decimal, Binary, Hexa-decimal and Octal – Conversions -CODES: BCD, ASCII, Excess-3, GRAY and UNICODE. BINARY ARITHMETIC: Addition, Compliments, Subtraction using Complements (r's and (r-1)'s).

**(10 Hrs)**

**Unit II:**

LOGIC GATES: Inverter-AND-OR-NAND-NOR-XOR-XNOR, BOOLEAN ALGEBRA AND LOGIC SIMPLIFICATION: Boolean operations and Expressions – Laws and Rules of Boolean Algebra – De-Morgan's Theorem – Boolean analysis of Logic Circuits – K-Map and Function Simplification using K Map– SOP and POS

**(15 Hrs)**

**Unit III:**

Combinational Circuits: Basics of Combinational Logic Circuits – Implementing Combinational Logic – Universal Property of NAND and NOR gates, Adders (Half, Full and Parallel) – Comparators – Decoders – Encoders – Multiplexers - Demultiplexers- Parity Generators-Parity Checkers.

**(15 Hrs)**

**Unit IV:**

Sequential Circuits:-Latches, Flip Flops – SR, JK Flip flops – Master Slave Flip flop. COUNTERS: Asynchronous counters - Synchronous counters- Shift Registers in Detail.

(14 Hrs)

**Books for Study:**

1. Digital Fundamentals, Floyd and Jain, 8<sup>th</sup>Edn, Pearson Education.
2. Computer system Architecture – M. Morris Mano - PHI Pvt Limited.

**Books for Reference:**

1. Digital Principles and Applications; Leach and Malvino, GoutamSaha; TMH; 7th edition (Special Indian Edition).

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 15    |
| II   | 15    |
| III  | 15    |
| IV   | 15    |

## GENERAL AWARENESS COURSE IV: 4A14CSC OPERATING SYSTEMS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 4        | 4A14CSC     | 3              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Familiarize with basics of design of operating systems.

**CO2:** Introduce basic working process of operating systems.

**CO3:** To understand the importance process and scheduling.

**CO4:** To understand the issues in memory management.

#### **Unit I: Introduction**

Functions of an operating system, Kernel Data Structures, Operating Systems in different Computing Environments, Operating System Services, Operating System Interfaces, System Calls (Introduction only), Operating System Design and Implementation approaches, Operating System Structures - simple, layered, micro kernel, modules, System Boot.

**(13 Hrs)**

#### **Unit II: Process Management**

Process Concept- The Process, Process State, Process Control Block Process Scheduling – Scheduling Queues, Schedulers, Context Switch - CPU Scheduling: Basic Concepts – CPU scheduler, Pre-emptive scheduling, Dispatcher - Scheduling Criteria – Scheduling Algorithms - FCFS, SJFS, Priority Scheduling, Round Robin Scheduling.

**(14 Hrs)**

#### **Unit III: Deadlock**

Dead locks: Characterization – necessary conditions – Resource allocation graph – Methods for handling deadlock - Deadlock prevention – mutual exclusion, hold and wait, no preemption, circular wait – Deadlock avoidance – safe state, Resource allocation graph, Banker's algorithm, Safety algorithm, Resource request algorithm – Deadlock detection – single instance of each resource type, several instances of a resource type - recovery from dead lock – process termination, resource preemption.

**(15 Hrs)**

#### **Unit IV: Memory Management**

Main Memory: Swapping, Contiguous Memory Allocation, Segmentation, Paging,  
Virtual Memory: Demand Paging, Copy-on-Write, Page Replacement - Basic, FIFO Page  
Replacement, Optimal Page Replacement, LRU Page Replacement

Mass Storage Structure: Disk Structure-Disk Scheduling: FCFS Scheduling, SSTF  
Scheduling, SCAN Scheduling-SCAN Scheduling, LOOK Scheduling - Selection of a  
Disk Scheduling Algorithm

**(12 Hrs)**

#### **Books for Study:**

1. Abraham Silberschatz, Peter B Galvin, Greg Gagne, Operating System Concepts, 9/e, Wiley India, 2015.

#### **Books for Reference:**

1. Garry Nutt, Operating Systems: 3/e, Pearson Education, 2004
2. Dhananjay M. Dhamdhere, Operating Systems A Concept Based Approach, 3rd Ed, TMH
3. William Stallings, Operating Systems: Internals and Design Principles, Pearson, Global Edition, 2015.
4. Andrew S Tanenbaum, Herbert Bos, Modern Operating Systems, Pearson, 4/e, 2015.
5. Madnick S. and J. Donovan, Operating Systems, McGraw Hill, 2001.
6. Deitel H. M., An Introduction to Operating System Principles, Addison-Wesley, 1990.

#### **Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 14    |
| II   | 16    |
| III  | 16    |
| IV   | 14    |



## CORE COURSE V: 4B05CSC SOFTWARE ENGINEERING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 4        | 4B05CSC     | 4              | 4      | 3        |

### COURSE OUTCOME

**CO1:** To understand the Software Development Life Cycle Models.

**CO2:** To familiarize with Software Requirement Analysis and Specification.

**CO3:** To familiarize with Classical Software Design Techniques.

**CO4:** To familiarize with various Software Testing Techniques and Tools.

#### **Unit I: Introduction to software engineering**

Definition, program versus software, software process, software characteristics, brief introduction about product and process, software process and product matrices; Software life cycle models – Definition, waterfall model, increment process model, evolutionary process model, selection of the life cycle model.

**(18Hrs)**

#### **Unit II: Software Requirement Analysis and Specification**

Requirements engineering, types of requirements, feasibility studies, requirement elicitation, various steps of requirement analysis, requirement documentation, requirement validation.

**(18Hrs)**

#### **Unit III: Software design**

Definition, various types, objectives and importance of design phase, modularity, strategy of design, function-oriented design. Objected Oriented Design – Analysis, design concept, design notations and specifications, design methodology.

**(18Hrs)**

#### **Unit IV: Software Testing**

What is testing?, Why should we test?, who should do testing?, test case and Test suit, verification and validation, alpha beta and acceptance testing, functional testing, techniques to design test cases , Boundary value analysis, equivalence class testing, decision table based testing, cause effect graphing techniques; structural testing, path

testing, cyclomatic complexity, mutation testing, levels of testing, unit testing, integration testing, system testing, validation testing

(18Hrs)

**Books for Study:**

1. Software Engineering (Third Edition), K KAggarwal, Yogesh Singh, New age International Publication (For Module 1,2,4 and case study of Module 3)
2. An integrated approach to software Engineering (Second Edition), PankajJalote, Narosa Publishing House - (For Module 3).
3. Computer system Architecture – M. Morris Mano - PHI Pvt Limited.

**Books for Reference:**

1. Fundamentals of Software Engineering Rajib Mall PHI Publication
2. Software Engineering (Seventh edition), Ian Sommerville – Addison Wesley.
3. Software Engineering A practitioner’s approach (Sixth Edition), Roger S Pressman-McGraw Hill.
4. Fundamentals of Software Engineering (Second Edition), Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli – Pearson Education.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 15    |
| II   | 15    |
| III  | 15    |
| IV   | 15    |

## CORE COURSE VI: 4B06CSC LAB 2 – DATA STRUCTURES USING C++

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 4        | 4B06CSC     | 3*             | 3      | 3        |

\*Lab will be conducted for 3 hours each in III and IV Semesters

### Guidelines

Design C++ programs for the following questions

All concepts must be implemented using classes

main() function create the object of the class and use the property.

### SECTION - A

1. Implement Linear search algorithm and print number of comparisons (1hr.)  
Input: Number of numbers must be greater than 20, Number to search  
Output: Found/Not Found, No. of Comparisons
2. Implement Binary search algorithm and print number of comparisons (1hr.)  
Input: Sorted List and Number to search  
Output: Found/ Not Found, No. of Comparison
3. Implement Insertion sort algorithm and print number of comparisons (1hr.)  
Input: Number of numbers must be greater than 20  
Output: Sorted List, No. of Comparison
4. Implement Bubble sort algorithm and print number of comparisons (1hr.)  
Input: Number of numbers must be greater than 20  
Output: Sorted List, No. of Comparison
5. Implement Quick sort algorithm and print number of comparisons (2hrs.)  
Input: Number of numbers must be greater than 20  
Output: Sorted List, No. of Comparison
6. Implement Selection sort algorithm and print number of comparisons (1hr.)  
Input: Number of numbers must be greater than 20  
Output : Sorted List, No. of Comparison
7. Implement Merge sort algorithm and print number of comparisons (1hr.)  
Input: Number of numbers must be greater than 20  
Output : Sorted List, No. of Comparison
8. Add two general Polynomial(1hr.)

- Input: Highest Power of Each Polynomial and quotients of each power  
Output: Resultant Polynomial
9. Subtract two general Polynomial(1hr.)  
Input: Highest Power of Each Polynomial and quotients of each power  
Output: Resultant Polynomial
10. Extract substring of given dimension from given string (1hr.)  
Input: String, Start Index, No. of characters  
Output: Substring
11. Evaluate polynomial entered by user with respect to given value of x (1hr.)  
Input: highest power of polynomial, Coefficients, value of x  
Output: Value of polynomial with respect to given x value.
- SECTION- B**
12. Implement Stack Operations (2hrs.)  
Input: Size of Stack, choice for menu 1. Push 2. Pop 3. Traverse 4. Exit and data item  
Output: with respect to choice
13. Evaluate post fix expression with the support of stack (2hrs.)  
Input: Post Fix Expression\  
Output: Evaluated Result
14. Implement Queue Operations (1hr.)  
Input: Size of Queue, choice for menu 1. Insert 2.Delete 3. Traverse 4. Exit and item  
Output: with respect to choice
15. Implement Circular Queue Operations (2hrs.)  
Input: Size of Queue, choice for menu 1. Insert 2. Delete 3. Traverse 4. Exit and item  
Output: with respect to choice
16. Implement following Linked list Operations (1hr.)  
Input: Choice for menu 1. Insert 2. Delete 3. Traverse 4. Exit and data item  
Output: with respect to choice
17. Implement following Linked list Operations (2hrs.)

Input: Choice for menu 1. Insert after a given node 2. Delete given node  
3, traverse 4. exit and data item

Output: with respect to choice

18. Implement following Two Way List Operations (2 hrs.)

Input: Choice for menu 1. Insert 2. Insert after a given node 3. Delete given node  
4. Delete 5. Traverse 6. Exit and data item

Output: with respect to choice

19. Implement following Binary Search Tree operations (2 hrs.)

Input: choice for menu 1. Insert 2. Delete 3. Infix traversal 4. Prefix 5. Postfix 6.  
Exit and item

Output: with respect to choice

**CORE COURSE VII: 4B07CSC LAB 3 – DATABASE MANAGEMENT SYSTEM**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>4</b>        | <b>4B07CSC</b>     | <b>2*</b>                 | <b>2</b>      | <b>3</b>            |

\*Lab will be conducted for 2 hours each in III and IV Semesters

## CORE COURSE VIII: 5B08CSC WEB TECHNOLOGY

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 5        | 5B08CSC     | 4              | 4      | 3        |

### COURSE OUTCOME

**CO1:** Understand different components in web technology and WWW.

**CO2:** Learn to develop interactive Web pages.

**CO3:** Present a web document with server-side scripting using PHP.

**CO4:** Know the basics of AJAX.

#### **Unit I: Introduction**

Introduction to Internet and WWW, Evolution of the Internet and World Wide Web, Web Basics, Static Vs Dynamic web pages, Client-Side Scripting versus Server-Side Scripting, World Wide Web Consortium (W3C). Web hosting, Types of web hosting, Hosting Space, Domain Name Registration, Free Hosting, Responsive Web designing.

**(12 Hrs)**

#### **Unit II: Introduction to HTML**

Introduction to HTML, Editing HTML5, W3C HTML5 Validation Service, Headings, Linking, Images, Special Characters and Horizontal Rules, Lists, Tables, Forms, HTML5 Form Input types, input and data list Elements and autocomplete Attribute, Page structure Element.

**(18 Hrs)**

#### **Unit III: Scripting with JavaScript**

Introduction to JavaScript, memory concepts, operators, functions – Introduction, Program Modules in JavaScript, Function Definitions, Notes on Programmer-Defined Functions, scope rules and recursion, arrays – introduction, declaring and allocating arrays, examples using arrays, objects – math, string and date objects, dialog boxes.

**(22 Hrs)**

#### **Unit IV: PHP and Ajax Enabled Rich Internet Applications**

Introduction to PHP, converting between datatypes, operators, initializing and manipulating arrays, string concatenations, Form processing.

Introduction to AJAX, Traditional Web Applications vs. Ajax Applications, Traditional web applications, Ajax applications, Rich Internet Applications (RIAs) with Ajax, History of Ajax.

(20 Hrs)

**Books for Study:**

1. Internet & World Wide Web How to Program, 5/e – Paul J Deitel, Harvey M Deital, AbbaeyDeital
2. Julie C. Meloni, HTML and CSS in 24 Hours, Sams Teach Yourself (Updated for HTML5 and CSS3), Ninth Edition
3. Programming in PHP, O'Reilly

**Books for Reference:**

1. Mastering HTML, CSS & Javascript Web Publishing Paperback, 2016 - by Laura Lemay, Rafe Colburn & Jennifer Kyrnin , BPB Publications
2. HTML & CSS: The Complete Reference, Fifth Edition - Thomas a Powell, Tata McGraw Hill
3. JavaScript – Definitive Guide O'Reilly 6th Edition
4. <https://www.w3schools.com>

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 15    |
| II   | 15    |
| III  | 15    |
| IV   | 15    |



## CORE COURSE IX: 5B09CSC JAVA PROGRAMMING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 5        | 5B09CSC     | 4              | 4      | 3        |

### COURSE OUTCOME

CO1: Know the overall structure and concept of logic building activity of Java programming language

CO2. Identify the real-world things as well as the relationship between them and understand transforming them into their corresponding computer representations.

CO3. Realize how to achieve code reusability using inheritance, interfaces and packages and expedite application development activities.

CO4. Familiarize simple and robust way of handling multitasking and runtime error as well as such kind of abnormal situations within a program.

CO5. Design GUI based applications and applications that can be transmitted over internet.

#### **Unit I:**

Introduction to Java programming: Java history; features of java; Byte Code; Overview of Java, Java Language fundamentals: Building blocks; Data types; variables And Arrays. Operators - Arithmetic, Bitwise, Relational, Boolean Logical, Assignment; Control statements.

**(12 Hrs)**

#### **Unit II:**

Introducing Classes: Class fundamentals; Introducing methods; Declaring Objects; Constructors; This keyword; Garbage collection; the finalize method; A closer look at methods and classes; Inheritance basics; Using Super; When Constructors are called; Method Overriding; Dynamic method dispatch; Abstract classes; Uses of final keyword.

**(20 Hrs)**

#### **Unit III:**

Packages: Introduction-Creating a Package- CLASSPATH; Accessing a package- simple program using package; Interfaces: definition-extending interface-implementing interface-simple programs using interface. Exception handling: Basics; Try, catch, finally, multiple catch, nested try, throw; User Defined exception; Chained Exception; Multi-threading: introduction -Creating threads; thread life cycle; thread Priorities, Synchronization. Enumeration and Auto boxing.

(20 Hrs)

**Unit IV:**

Applets: Fundamentals [page- 318]; Applet skeleton [pg-751], The HTML APPLET tags; The Abstract Window Toolkit:- Introduction to AWT classes; AWT controls (Labels, Buttons, Check box, Radio buttons; Choice control; List, Text box, Scroll bars). Event handling of Buttons and keyboard, Introduction to JDBC.

(20 Hrs)

**Books for Study:**

1. Java The Complete Reference-Ninth Edition- Oracle Press- Herbert Schildt

**Books for Reference:**

1. Java complete reference by BalaguruSwamy
2. Core Java 2, Cay S. Horstmann, Gary Cornell, Pearson Education
3. Dr. S. B. Kishor, Rajani Singh etc, PROGRAMMING IN JAVA, 1st Ed. published by DAS GANU Prakashan, Nagpur in Mar. 2018. (ISBN: 978-93-84336-49-3)

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 15    |
| II   | 15    |
| III  | 15    |
| IV   | 15    |

## CORE COURSE X: 5B10CSC COMPUTATION USING PYTHON

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 5        | 5B10CSC     | 3              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Learn Python for expressing computation

**CO2:** Familiarize with functions and modules in python

**CO3:** Understand object-oriented programming concepts

**CO4:** Learn the techniques for database connectivity and GUI programming in Python

#### **Unit I: Basic Elements and Control Statements**

Features of Python, Different Methods to Run Python, Basic Elements (Objects, Expressions, Numerical Types, Strings, Variables), Comments, Indentation in Python, Input and Output in Python, import function, Operators in Python, Branching (if, else, elif), Iteration (while, for), range and enumerate functions, Tuples, Lists, Sets, Dictionaries, Built-in methods of lists, sets and dictionaries, Mutable and Immutable Objects.

**(14 Hrs)**

#### **Unit II: Functions, Modules and Exception Handling**

Functions Definition, Function Calling, Function Arguments (Required, Keyword, Default), Recursion, Modules, Built-in Modules, Creating Modules, File Handling (Opening, Closing, Writing, Reading), Exceptions, Built-in Exceptions (IndexError, OverflowError, ZeroDivisionError, RuntimeError), Exception Handling.

**(16 Hrs)**

#### **Unit III: Object Oriented Programming, numpy Arrays and Data Visualization**

Class Definition, Object Creation, Built-in Attribute Methods, Object Oriented Programming Features of Python. Arrays in Python, Numpy Module, ndarray, Creating Arrays (array, zeros, ones, empty, linspace, arrange, random), Two-Dimensional Array, Indexing, Slicing, Iterating, Copying, Splitting, Shape Manipulation (reshape, transpose, resize), Arithmetic Operations on Arrays. Data Visualization in Python matplotlib Module, pyplot, plot(), scatter, bar charts, Formatting, figure(), subplot(), text(), xlabel(), ylabel(), title(), Plotting Simple Mathematical Functions ( $\sin x$ ,  $x^2$ )

**(10 Hrs)**

#### **Unit IV: Connecting to Database and GUI Programming**

Connecting to a Database, Basic Operations on Database (Crater, Insert, Update, Delete), Fetching Data from a Database, Transaction Control.

GUI Programming using Tkinter, Tkinter Widgets (Label, Message, Entry, Text, Button, tkMessageBox, RadioButton, Checkbutton, Listbox, Menu, Menubutton, Scale, Scrollbar, Canvas), Layout Managers.

**(14 Hrs)**

#### **Books for Study:**

1. Taming Python By Programming, Dr. Jeeva Jose, Khanna Publishing
2. Introduction to Computation and Programming Using Python with Application to Understanding Data - John V. Guttag, PHI (2016)
3. <https://www.numpy.org/devdocs/user/quickstart.html>
4. [https://matplotlib.org/users/pyplot\\_tutorial.html](https://matplotlib.org/users/pyplot_tutorial.html)

#### **Books for Reference:**

1. <https://www.tutorialspoint.com/python/>
2. Introduction to Computer Science using Python - Charles Dierbach, Wiley (2015)
3. Python for Education by Ajith Kumar B P
4. <https://docs.python.org/3/tutorial/index.html>
5. Introduction to Computer Science and Programming Using Python Provided by Massachusetts Institute of Technology (MITx)  
Available at: (<https://www.edx.org/course/introduction-to-computer-science-and-programming-using-python-2>)

#### **Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 15    |
| 2    | 15    |
| 3    | 15    |
| 4    | 15    |

## CORE COURSE XI: 5B11CSC-A ALGORITHM DESIGNING

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| 5        | 5B11CSC-A   | 4                 | 4      | 3           |

### COURSE OUTCOME

**CO1:** Capable to select suitable algorithm design technique.

**CO2:** Able to design optimum algorithms for problems.

**CO3:** Skilled to design solutions for real problems.

#### **Unit I:**

Divide and Conquer – General method; Binary search, Finding the maximum and minimum, Merge sort, Quick sort, Performance measurement of quick sort, Strassen's matrix multiplication.

**(20Hrs)**

#### **Unit II:**

Greedy method – General method, Knapsack problem, job sequencing with deadlines, minimum cost spanning trees, prim's algorithm, kruskal's algorithms, optimal merge patterns, single source shortest path.

**(22 Hrs)**

#### **Unit III:**

Dynamic programming – General method, multistage graph, all pairs shortest path, single shortest path, 0/1 knapsack travelling salesperson problem.

**(15Hrs)**

#### **Unit IV:**

Backtracking – General method, 8-queens problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

**(15Hrs)**

#### **Books for Study:**

1. Ellis Horowitz, Sartaj Sahni, S Rajasekharan – Computer Algorithms/C++ - Second Edition, Universities press, 2008 (Paperback Edn)

**Books for Reference:**

1. Introduction to the design and Analysis of Algorithms, AnanyLevitin, 2nd Edn, Pearson education.
2. The design and analysis of computer Algorithms Alfred V Aho John E Hopcroft Pearson Education.
3. Algorithm Design, Foundation, Analysis and Examples, Dr. Vijayakumar and Dr. Jubey Mathew, Vimala Publications.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 17    |
| II   | 17    |
| III  | 13    |
| IV   | 13    |

## CORE COURSE XI: 5B11CSC-B LINUX ADMINISTRATION

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 5        | 5B11CSC-B   | 4              | 4      | 3        |

### COURSE OUTCOME

**CO1:** To learn basic Linux commands and understand the file system structure

**CO2:** To understand the Boot loaders and the configuration files

**CO3:** To learn different system services, maintenance and configuring these

**CO4:** To experience Shell Scripting

#### **Unit I:**

Linux OS: History, Features and benefits of Linux, basic concepts of multi user system , open source, free Software concepts, Types of users in Linux, Types of files. BASICS : login, password, creating an account, shell and commands, logout, changing password, files and directories, relative and absolute pathnames, directory tree, current working directory, referring home directory, creating new directories, copying files, moving files, deleting files and directories , wild cards, hidden files, cat command.

**(20 Hrs)**

#### **Unit II:**

Vi editor: different modes-command mode, insert mode, last line mode, vi Editing commands – moving within a file, deleting, editing, Copy and Paste Commands, Saving and Closing the file, redirecting input/output-filter, pipes. File permissions: user, group, ls command (long listing), changing file permission. Shell Scripting: Types of shell, Basic shell configuration for bourne and bash shell: /etc/profile, /etc/bashrc, ~/.bash\_profile, ~/.bash\_login, ~/.profile, ~/.bashrc, ~/.bash\_logout, ~/.bash\_history. Bourne shell scripts, script execution, variables and parameters, Control structures - Shell if then else, Shell if then elif, Shell for loop, Shell while loop, Shell until loop, Shell case, Shell function.

**(20 Hrs)**

#### **Unit III:**

Linux Boot process: LILO - boot process, /etc/lilo.conf file, GRUB - /etc/grub.conf file runlevels, rc files, startup scripts. Mounting: mounting file systems, structure of /etc/fstab. Linux Administration: Major services in Linux system - init, /etc/inittab file,

login from terminal, syslog and its configuration file /etc/syslog.conf, periodic command execution: at and cron, crontab file, GUI, X windows. Starting and stopping different services – service command.

**(16 Hrs)**

**Unit IV:**

System Maintenance: tmpwatch command, logrotate utility. Backup and Restore: types of backup - full, differential, incremental, cp, tar commands. Linux Installation: Partitioning, MBR, SWAP, file system mount points, rpm utility - installation of packages.

**(16 Hrs)**

**Books for Study:**

1. Unix Shell Programming, Yeshwanthkanethkar
2. Essential System Administration, O'reilly & Associates.

**Books for Reference:**

1. Unix in a Nutshell, by Daniel Gilly, O'Reilly & Associates.
2. Linux Administration handbook, Nemeth, PHI.
3. Red Hat Linux Bible.
4. A user guide to the Unix system, Thomas, Yates Tata McGraw Hill

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 15    |
| II   | 15    |
| III  | 15    |
| IV   | 15    |



**CORE COURSE XI: 5B11CSC-C COMPUTER GRAPHICS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>5</b>        | <b>5B11CSC-C</b>   | <b>4</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

**CO1:** Understand basic concepts of graphics input and display devices.

**CO2:** Learn line and circle drawing algorithms.

**CO3:** Familiarization with 2D and 3D transformations and projections.

**CO4:** Understand fundamentals of image processing.

**Unit I:**

Introduction, Overview of Graphics Systems, Display devices, Input devices, Hard-Copy devices, Graphics software. Line Drawing Algorithms-DDA, Bresenham, Circle Generating Algorithm – Midpoint Algorithm, Area filling algorithms – Flood Fill and Boundary Fill algorithms.

**(18 Hrs)**

**Unit II:**

Output primitives-Color and Grayscale levels, 2D Transformations-Translation, Rotation, Scaling, Reflection, Shear, Matrix Representation and Homogenous Coordinates, Composite Transformations.

**(18 Hrs)**

**Unit III:**

Two-Dimensional viewing, Window-to-viewport Transformation, Clipping - Point Clipping, Line Clipping – Cohen Sutherland Algorithm, Polygon Clipping – Sutherland Hodgeman Algorithm, Text clipping.

**(18 Hrs)**

**Unit IV:**

3D object representations-Polygon surfaces, Polygon tables, Plane equations, Polygon Meshes, 3D transformations-Translation, Rotation, Scaling, Rotation about an arbitrary axis, Reflection, Shear, 3D viewing- Parallel Projection, Perspective Projection.

**(18 Hrs)**

**Books for Study:**

1. Donald D Hearn and M. Pauline Baker, Computer Graphics, C Version, 2nd Edition, Pearson.

**Books for Reference:**

1. Foley, van Dam, Feiner& Hughes, Computer Graphics: Principles and Practice in C, 2nd Edition, Pearson
2. Ranjan Parekh, Principles of Multimedia, Tata McGrawHill,2006
3. D.P. Mukherjee, Fundamentals of Computer Graphics and Multimedia, PHI.
4. David Rogers, Procedural Elements of Computer Graphics, Rogers, 2<sup>nd</sup> Edition, McGraw Hill Education.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 15    |
| II   | 15    |
| III  | 15    |
| IV   | 15    |

**CORE COURSE XII: DATA COMMUNICATION AND COMPUTER NETWORKING**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 6        | 6B12CSC     | 4              | 4      | 3        |

**COURSE OUTCOME**

**CO1:** Understand state-of-the-art in network protocols, architectures and application.

**CO2:** To acquire knowledge about different computer networks

**CO3:** To understand the use of layer architecture for networking systems.

**Unit I:**

Introduction to data communication, important elements /components of data communication. Transmission media- Guided media, Unguided media. Synchronous / Asynchronous data transmission. Line configuration – Simplex, Half duplex, Duplex. Network topologies – star, Bus, ring, Mesh. Computer networks, Use, network hardware, network structure- point to point connection, multicast, broadcast, classification of networks-LAN, WAN, MAN.

**(18 Hrs)**

**Unit II:**

Reference models, the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / Ip models. Data Link Layer, Design issues, Services to network layer, Framing- character count, character stuffing, bit stuffing, physical layer coding violation. Error control, flow control, Elementary data link protocols- unrestricted simplex protocol, simplex stop and wait protocol, simplex protocol for a noisy channel.

**(18 Hrs)**

**Unit III:**

Network layer, design issues, services to the transport layer, routing algorithms- adaptive, non-adaptive algorithms, optimality principle, dijkstras shortest path routing algorithm, flow-based routing, hierarchical routing, congestion control algorithms–the leaky bucket algorithm, the token bucket algorithm.

**(18 Hrs)**

**Unit IV:**

Transport layer, design issues, connection management-addressing, establishing and releasing connection, transport layer protocols- TCP, UDP

Application layer – Basic Idea of telnet, ftp, http, smtp, pop3.

(18 Hrs)

**Books for Study:**

1. Computer Networks, Andrew S. Tanenbaum & David J. Wetherall, Pearson.

**Books for Reference:**

1. Data Communication and Networking, Behrouz A. Forouzan, McGraw Hill Education.
2. Achyut S. Godbole and Atul Kahate, Data communication and Networks, 2<sup>nd</sup> Ed, McGraw Hill
3. Computer Networking: A Top-Down Approach, Kurose James F. and Ross Keith W., Pearson.
4. R. S. Rajesh, K. S. Easwara Kumar and R. Balasubramanian, Computer Networks – Fundamentals and Applications, Vikas Publishing House.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 15    |
| 2    | 15    |
| 3    | 15    |
| 4    | 15    |

### CORE COURSE XIII: 6B13CSC COMPILER DESIGN

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 6        | 6B13CSC     | 4              | 4      | 3        |

#### COURSE OUTCOME

- CO1:** Learn the basic principles of compiler.  
**CO2:** Get an idea about the related programs.  
**CO3:** Understand different components of a compiler.  
**CO4:** Understand the phases of a compiler.

#### **Unit I: INTRODUCTION TO COMPILING**

Compilers, Analysis of the Source program, phases of a compiler, cousins of the compiler, grouping of phases, compiler construction tools.

(18Hrs)

#### **Unit II: LEXICAL ANALYSIS**

Role of Lexical Analyzer, Input buffering, Specification of tokens, recognition of tokens, Finite Automata.

(18Hrs)

#### **Unit III: SYNTAX ANALYSIS**

The role of a Parser, context free grammars, Top down parsing, Recursive Descent Parsing, Predictive Parsers, bottom up parsing, shift reduce parsing, operator precedence parsing.

(18Hrs)

#### **Unit IV: CODE GENERATION & OPTIMIZATION**

Symbol table, Intermediate languages, Issues in the design of code generator, the target machine, basic blocks and flow graphs, peep-hole optimization, principal sources of optimization, optimization of basic blocks, Loops in flow graphs

(18Hrs)

#### **Books for Study:**

1. Alfred V Aho, Ravi Sethi & Jeffrey D Ullman, "Compilers- Principles, Techniques and Tools", Pearson education

#### **Books for Reference:**

1. KVN Sunitha, Compiler Construction, Pearson Education

2. Parag H Dave, Himanshu B Dave, Compilers –Principles and Practice

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 15    |
| II   | 15    |
| III  | 15    |
| IV   | 15    |

**CORE COURSE XIV: 6B14CSC COMPUTER ORGANIZATION**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>6</b>        | <b>6B14CSC</b>     | <b>3</b>                  | <b>3</b>      | <b>3</b>            |

**COURSE OUTCOME**

- CO1:** Understand the basic terminology of computer system.
- CO2:** Understand the functional units of a computer system.
- CO3:** Understand the basic operations of a computer system.
- CO4:** Understand the memory organization in a computer system.

**Unit I:**

Basic structure of computer-Types of computers-Functional Units-Basic Operational Concepts-Bus Structure-Multiprocessors and Multi computers-Data Representation-Fixed Point representation and floating-point representation.

**(9 Hrs)**

**Unit II:**

Register Transfer and Micro operations – Register Transfer language-Register Transfer-Bus and memory Transfer-Three state bus buffers-Memory Transfer-Basic Computer Organization and Design – Instruction Codes – Fetch & Decode Instructions – Register Reference Instructions – Memory Reference Instruction – Input output & Interrupt.

**(14 Hrs)**

**Unit III:**

Micro Programmed Control – Control Memory – Address sequencing – Central Processing Unit – General Register Organization – Control word – Stack Organization – Register stack - Memory Stack – Reverse Polish notation – Evolution of Arithmetic expressions – Instruction Formats – Addressing modes – Data Transfer and Manipulations – reduced Instruction set computer(RISC).

**(16 Hrs)**

**Unit IV:**

Input Output Organization– Input/Output Interfaces –Asynchronous Data Transfer – Modes of transfer –Priority Interrupt – Direct Memory Access (DMA) - Input Output Processor - Serial Communications. Memory Organization – Hierarchy – Main memory – Auxiliary Memory –Associative Memory – Cache memory – Mapping – Multiprocessors

– Characteristics of multiprocessors - Inter connection structures.

(15 Hrs)

**Books for Study:**

1. Computer system Architecture –M.Morris Mano - PHI Pvt Limited
2. Computer Organization - Carl Hamacher –International Edition

**Books for Reference:**

1. Computer Organization and Architecture, William Stallings, 7th Edn, Pearson Education.
2. Computer Architecture & Organization John P Hayes –McGraw Hill

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 10    |
| II   | 18    |
| III  | 15    |
| IV   | 17    |



**CORE COURSE XIV: 6B15CSC-A INFORMATION SECURITY**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>6</b>        | <b>6B15CSC-A</b>   | <b>4</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

**CO1:** To understand the need of information security and to master information security Concepts, mechanisms and services as well as issues related to information Security.

**CO2:** To be familiar with cryptography and its categories.

**CO3:** Distinguish public and private key crypto systems and familiarize the rsa crypto System.

**CO4:** To attain the knowledge of digital signature and its security services.

**Unit I:**

Introduction to Information Security-The need for Security, Principles of security - confidentiality, Authentications, Integrity, Non-repudiation.Types of attacks-Passive attacks, Active attacks, Virus, Worm, Trojan horse.Introduction to Cryptography and Steganography.

**( 15Hrs)**

**Unit II:**

Symmetric Key Encipherment - Traditional symmetric Key Ciphers: Introduction-Kirchhoff's principle, cryptanalysis, categories of traditional ciphers; Substitution Ciphers- mono-alphabetic ciphers, polyalphabetic ciphers; Transposition Ciphers-key-less and keyed transposition ciphers, Stream and Block Ciphers.

**(20Hrs)**

**Unit III:**

DES: Data Encryption Standard:-Introduction, DES Structure-Initial and final permutations, DES function; Round Key Generation; Avalanche and completeness effect; Weak keys; Multiple DES- Double DES, Triple DES; Security of DES- Brute- force attack, Differential cryptanalysis, Linear cryptanalysis. Public key Cryptosystem: Principles of Public Key Cryptosystems; Applications of public Key Crypto systems,

Requirement for Public Key Cryptosystem, Public Key Cryptanalysis. RSA Algorithm–  
Description of the Algorithm, The security of RSA

(18Hrs)

**Unit IV:**

Digital Signature:-Comparison between conventional and digital signature-Inclusion, Verification, Relationship, Duplicity; Process-needs for keys, signing the digest; Services-message authentication,message integrity, non-repudiation, confidentiality; Digital signature Forgery and types;Digital Signature Schemes-RSA digital signature scheme.

( 19Hrs)

**Books for Study:**

1. Behrouz A. Forouzan and DebdeepMukhopadhyay, Cryptography And Network Security, 3rd Ed, McGraw Hill (Units I, II, IV)
2. William Stallings, Cryptography and Network Security - Principles and Practice Paperback, 7th Ed, Pearson (Unit III)

**Books for Reference:**

1. Bishop Matt, Introduction to Computer Security, Addison-Wesley,2004.
2. Pieprzyk Josef, Hardjono Thomas and Seberry Jennifer, Fundamentals of Computer Security, Springer, 2003.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 10    |
| II   | 20    |
| III  | 15    |
| IV   | 15    |

## CORE COURSE XIV: 6B15CSC-B DATA MINING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 6        | 6B15CSC-B   | 4              | 4      | 3        |

### COURSE OUTCOME

- CO1:** To Introduce the Concepts of Data Mining and its Applications.  
**CO2:** To Understand Investigation of Data using practical Data Mining Tools.  
**CO3:** To Introduce Association Rules Mining.  
**CO4:** To Introduce Clustering and Classification.

### **Unit I: Fundamentals of Data Mining**

Introduction: Data Mining – Knowledge Discovery Process (KDD), Fundamentals of Data Mining. Functionalities of Data Mining, Classification of Data Mining Systems, Major Issues in Data Mining. Data Warehouse: Definition, Multi – User Architecture, OLAP, Data Warehouse Vs Heterogeneous DBMS, Data Warehouse Vs Operational DBMS, OLAP Vs OLTP, Needs of Data Warehouse. Multi -Dimensional Data Model, OLAP Operations, Data Warehouse Schema, Data Warehouse Architecture, Warehouse Server, Meta Data, OLAP Engine, Data Warehouse Backend Process.

**(16 Hrs)**

### **Unit II: Data Preprocessing**

Data Preprocessing: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Integration, Discretization and Concept Hierarchy Generation.

**(20 Hrs)**

### **Unit III: Association Rules and Clustering Techniques**

Association Rule Mining: Apriori Algorithm, Partition Algorithm, FP – Tree Growth Algorithm, Generalized Association Rule. Partitioned Algorithm: K – Means Algorithm, K- Medoids Algorithm. Density – Based Clustering: DBSCAN. Categorical Clustering, STIRR.

**(18 Hrs)**

**Unit IV:Classification**

Classification Models: Introduction to Classification Models, Decision Tree: Definition, Tree Construction Principles, Best Split, Splitting Indices, Splitting Criteria. Introduction to Web, Spatial and Temporal Data Mining.

**(18 Hrs)**

**Books for Study:**

1. Data Mining Concepts and Techniques - Jiaweihan&MichelineKamber Harcourt, 2nd ED. 2005
2. Data Mining Techniques, Arun K Pujari, University Press

**Books for Reference:**

1. Intelligent Data Mining: Techniques and Applications, Da Raun, Guoqing Chen, Springer 1st Ed.
2. Data Mining: introductory and Advanced Topics, M. Dunham, Pearson Pub.

**Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| I           | 15           |
| II          | 15           |
| III         | 15           |
| IV          | 15           |

## CORE COURSE XIV: 6B15CSC-C BIOINFORMATICS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 6        | 6B15CSC-C   | 4              | 4      | 3        |

### COURSE OUTCOME

**CO1:** Understand Bioinformatics and biological databases.

**CO2:** Understand Concept of Biology.

**CO3:** Understand Sequence alignment and Similarity search tools.

**CO4:** Structural bioinformatics and Bioinformatic tools.

### **Unit I: Introduction and Biological Databases**

Introduction to bioinformatics, Molecular Biology and computational Biology, Goal, Scope, Applications and Limitations; Introduction to Biological databases – databases and types of databases, biological databases – primary, secondary and specialized; Information retrieval from biological databases.

**(18 Hrs)**

### **Unit II: Cell Biology and Genetics**

Prokaryotes and Eukaryotes, Introduction to cell structure –Plant and animal cell, Introduction to DNA – Chemical nature of DNA, Central dogma of molecular biology.

**(16 Hrs)**

### **Unit III: Sequence Alignment**

Pairwise sequence alignment – Global and local, Alignment algorithms – Dot matrix method, Dynamic programming method, Scoring matrices – PAM, BLOSUM, Statistical significance of Sequence alignment; Database Similarity Searching – BLAST, FASTA, Comparison of BLAST and FASTA, Statistical significance, Introduction to sequences.

**(18 Hrs)**

### **Unit IV: Structural Bioinformatics and Bioinformatic Tools**

Structure of protein – Amino acids, peptide formation, Structural forms of protein; Protein structure visualization – SwissPDB viewer, Pymol, Rasmol; Bioinformatic tools (EMBOSS package, ExPASy).

**(18 Hrs)**

**Books for Study:**

1. Essential Bioinformatics – JinXiong
2. Bioinformatics and molecular Evolution – T K Attwood and Paul G Higgs

**Books for Reference:**

1. Cell Biology, Genetics, Molecular biology, Evolution and Ecology – P S Verma, V K Agarwal.
2. Bioinformatics – A Practical guide to the analysis of genes and proteins - Andreas D. Baxevanis.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 15    |
| II   | 15    |
| III  | 15    |
| IV   | 15    |

**CORE COURSE XVI: 6B16CSC LAB 4 – JAVA PROGRAMMING**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>6</b>        | <b>6B16CSC</b>     | <b>4+2*</b>               | <b>3</b>      | <b>3</b>            |

\*Lab will be conducted for 4 hours in V semester and 2 hours in VI semester

**CORE COURSE XVII: 6B17CSC LAB 5 – WEB TECHNOLOGY AND PYTHON PROGRAMMING**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>6</b>        | <b>6B17CSC</b>     | <b>4+2*</b>               | <b>3</b>      | <b>3</b>            |

\*Lab will be conducted for 4 hours in V semester and 2 hours in VI semester



**CORE COURSE XVIII: 6B18CSC PROJECT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>6</b>        | <b>6B18CSC</b>     | <b>6</b>                  | <b>5</b>      | <b>-</b>            |

**PART B**

**B.SC. COMPUTER SCIENCE COMPLEMENTARY ELECTIVE COURSES**

**[FOR B.SC.MATHEMATICS/B.SC.STATISTICS/B.SC.PHYSICS/B.SC.  
ELECTRONICS PROGRAMMES]**

**WORK AND CREDIT DISTRIBUTION**

**(2019 ADMISSION ONWARDS)**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                                              | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> | <b>MARKS (INTERNAL + EXTERNAL)</b> |
|--------------------|------------------------------------------------------------------|-----------------|-----------------------|---------------|-------------------|------------------------------------|
| 1C01CSC            | INTRODUCTION TO COMPUTERS AND PROGRAMMING                        | 1               | 2                     | 2             | 3                 | 8+32                               |
| 1C01CSC            | LAB 1: PROGRAMMING IN C, WEB PROGRAMMING AND PYTHON PROGRAMMING  | 1               | 2                     | 0             | -                 | -                                  |
| 2C02CSC            | PROGRAMMING IN C                                                 | 2               | 2                     | 2             | 3                 | 8+32                               |
| 2C02CSC            | LAB 1: PROGRAMMING IN C, WEB PROGRAMMING AND PYTHON PROGRAMMING  | 2               | 2                     | 0             | -                 | -                                  |
| 3C03CSC            | WEB TECHNOLOGY WITH DATA BASE MANAGEMENT SYSTEM                  | 3               | 3                     | 2             | 3                 | 8+32                               |
| 3C03CSC            | LAB 1: PROGRAMMING IN C, WEB PROGRAMMING AND PYTHON PROGRAMMING  | 3               | 2                     | 0             | -                 | -                                  |
| 4C04CSC            | COMPUTATION USING PYTHON                                         | 4               | 3                     | 2             | 3                 | 8+32                               |
| 4C05CSC            | LAB 1: PROGRAMMING IN C, WEB PROGRAMMING AND PYTHON PROGRAMMING* | 4               | 2                     | 4             | 3                 | 8+32                               |

TOTAL 200 MARKS

- PRACTICAL DONE IN ALL THE 4 SEMESTER

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> |
|-------------------|------------------|
| EXTERNAL          | 4                |
| INTERNAL          | 1                |

### CONTINUOUS EVALUATION FOR THEORY

| COMPONENT                                   | WEIGHTAGE | REMARKS                                                                                                                                                         |
|---------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COMPONENT1:<br>TEST                         | 75%       | MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE BEST TWO MARKS OBTAINED IN THE TESTS CONDUCTED. |
| COMPONENT 2:<br>ASSIGNMENT/<br>SEMINAR/VIVA | 25%       | ANY ONE COMPONENT                                                                                                                                               |

### PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

|                                         |                        |                                         |
|-----------------------------------------|------------------------|-----------------------------------------|
| <b>Part A</b>                           | <b>Short Answer</b>    | <b>5 Questions x 1 Mark = 5 Marks</b>   |
|                                         | Answer all questions   | 5 Questions x 1 Mark = 5 Marks          |
| <b>Part B</b>                           | <b>Short Essay</b>     | <b>6 Questions x 2 Marks = 12 Marks</b> |
|                                         | Answer any 4 questions | 4 Questions x 2 Marks = 8 Marks         |
| <b>Part C</b>                           | <b>Essay</b>           | <b>5 Questions x 3 Marks = 15 Marks</b> |
|                                         | Answer any 3 questions | 3 Questions x 3 Marks = 9 Marks         |
| <b>Part D</b>                           | <b>Long Essay</b>      | <b>4 Questions x 5 Marks = 20 Marks</b> |
|                                         | Answer any 2 questions | 2 Questions x 5 Marks = 10 Marks        |
| <b>Total Marks Including Choice: 52</b> |                        |                                         |
| <b>Maximum Marks for the Course: 32</b> |                        |                                         |

**CONTINUOUS EVALUATION FOR PRACTICAL**

| <b>COMPONENT</b>                                                      | <b>WEIGHTAGE</b>                                                          | <b>REMARKS</b>                                                                                                         |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| COMPONENT 1:<br>LAB SKILLS,<br>OBSERVATION<br>NOTE AND<br>PUNCTUALITY | 25% FOR LAB<br>SKILL<br>25% FOR<br>OBSERVATION<br>NOTE AND<br>PUNCTUALITY | OBSERVATION NOTE IS MANDATORY.<br>MARKS SHOULD BE GIVEN<br>CONSIDERING OBSERVATION NOTE<br>LAB SKILLS AND PUNCTUALITY. |
| COMPONENT1:<br>TEST                                                   | 50%                                                                       | MODEL EXAMINATION SHOULD BE<br>CONDUCTED BEFORE EXTERNAL<br>EXAM AND CONSIDERED FOR<br>INTERNAL MARK                   |

**END SEMESTER EVALUATION FOR PRACTICAL**

| <b>COMPONENT</b>   | <b>PART A</b> | <b>PART B</b> |
|--------------------|---------------|---------------|
| Code Writing       | 7             | 7             |
| Execution & Output | 8             | 8             |
| Record             | 2             |               |
| <b>Total Marks</b> | <b>32</b>     |               |

**COMPLEMENTARY ELECTIVE COURSE I: INTRODUCTION TO  
COMPUTERS AND PROGRAMMING**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>1</b>        | <b>1C01CSC</b>     | <b>2</b>                  | <b>2</b>      | <b>3</b>            |

**COURSE OUTCOME**

**CO1:** Familiarize with the hardware components of a digital computer

**CO2:** Understand the basic idea of how data is represented in computers

**CO3:** Familiarize with types of software

**CO4:** Ability to design algorithmic solutions to problems

**Unit I: Introduction to Computers**

Characteristics of Computers, Computer System Hardware, Basic Concepts of CPU, ALU, Registers, Control Unit and System Bus, Components Inside a Computer Cabinet (Motherboard, BIOS, CMOS Chip, Ports and Interfaces, Expansion Slots, Memory Chips, Storage Devices, Processor - Basic functions), Computer Memory Representation, Memory Hierarchy, Basic Concepts of Cache Memory, Primary Memory (RAM and ROM), Secondary Memory Types (Working principle is not required).

**(10 Hrs)**

**Unit II: Number System and Codes**

Decimal, Binary, Hexa-Decimal and Octal Number Systems, Conversion Between Number Systems, Binary Arithmetic, Complements of Binary Numbers (1's Complement and 2's Complement), Signed Numbers, Floating Point Numbers, Binary Coded Decimal (8421 BCD Code, Applications, BCD Addition), Gray Code, ASCII Code, Unicode

**(8 Hrs)**

**Unit III: Types of Software and Networking**

System Software, Operating System (Functions of Operating Systems), Application Software, Software Acquisition (Retail, OEM, Demo, Shareware, Freeware, Open-Source Software), Computer Networks (Importance, Types of Networks – LAN, MAN, WAN).

**(8 Hrs)**

**Unit IV: Introduction to Programming**

Types of Computer Languages (Machine Language, Assembly Language, High-level Language), Basic Concepts of Compiler, Assembler, Interpreter, Linker and Loader.

Program Development Life Cycle, Algorithm, Flowcharts, Program Control Structures (Sequential, Selection, Loop), Programming Paradigms (Structured Programming, Basic Idea of Object-Oriented Programming), Characteristics of a Good Program

(10 Hrs)

**Books for Study:**

1. Anita Goel, Computer Fundamentals, Pearson
2. Thomas L. Floyd, Digital Fundamentals, 11<sup>th</sup> Edition, Pearson

**Books for Reference:**

1. Rajaraman V and Adabala N, Fundamentals of Computers, PHI
2. Brian W Kernighan, D is for Digital: What a well-informed person should know about computers and communications, CreateSpace Independent Publishing Platform
3. Stewart Venit and Elizabeth Drake, Prelude to Programming (6th Edition), Pearson

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 17    |
| II   | 13    |
| III  | 9     |
| IV   | 13    |

## COMPLEMENTARY ELECTIVE COURSE II: PROGRAMMING IN C

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 2        | 2C02CSC     | 2              | 2      | 3        |

### COURSE OUTCOME

**CO1:** Understand the building blocks of C programming language

**CO2:** Familiarize with program control structures in C

**CO3:** Learn procedural programming using functions

**CO4:** Understand user defined data types

#### **Unit I: Introduction to C**

C Character Set, Constants, Variables, Keywords, Instructions in C (Type Declaration, Arithmetic, Integer and Float Conversions), Operators in C (Arithmetic, Relational, Logical, Increment/Decrement, Assignment, Bitwise), Operator Precedence, Data Types (int, char, float, double, void), Compiling and Running C Programs in Linux.

**(7 Hrs)**

#### **Unit II: Inputs and Control Statements**

Formatted Console I/O Functions (printf, scanf), Escape Sequences, Unformatted Console I/O Functions (getch, putch, gets, puts), Decision control structures (Different forms of if statement), Conditional Operator, Case Control Structure (switch), Loop control structure (while, do-while, for), break and continue statements.

**(10 Hrs)**

#### **Unit III: Functions and Pointers**

User defined Functions (Advantages, Definition, Calling and Prototype), Library Functions, Pointers (Introduction to Pointers, Pointer Notation, Pointer Declaration and Initialization, Accessing Variable through Pointer), Call by Value and Call by Reference, Recursion

**(10 Hrs)**

#### **Unit IV: Arrays, Strings and Structures**

Arrays (Introduction, One Dimensional Arrays, Two Dimensional Arrays), Strings, Standard Library String Functions (strlen, strcpy, strcat, strcmp), Two-Dimensional Array of Characters. Storage Classes in C, Structures (Declaration, Initialization,

Accessing Structure Elements), Array of Structures, Array Within Structure, Renaming Data Types with Typedef, C Preprocessors (#define, #include).

**(9 Hrs)**

**Books for Study:**

1. Yashavant P. Kanetkar, Let Us C, 16<sup>th</sup> Edition, BPB

**Books for Reference:**

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill
3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 10    |
| II   | 16    |
| III  | 16    |
| IV   | 10    |



**COMPLEMENTARY ELECTIVE COURSE III: WEB TECHNOLOGY WITH  
DATABASE MANAGEMENT SYSTEM**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>3</b>        | <b>3C03CSC</b>     | <b>3</b>                  | <b>2</b>      | <b>3</b>            |

**COURSE OUTCOME**

**CO1:** Develop skills to design a web page using HTML

**CO2:** Understand HTML Forms and CSS Styling

**CO3:** Develop skills to develop database and retrieve data using SQL

**CO4:** Learn basics of server-side programming with PHP

**Unit I:HTML Basics**

Introduction to WWW and HTML, Steps for hosting a website, Structure of HTML, HTML elements and attributes, Headings, Paragraphs, Formatting tags, line breaks, Comments, Links, Images, Lists, HTML5 Semantic Elements (header, footer, nav, section, article, nav, aside), HTML Tables.

**(14 Hrs)**

**Unit II:HTML Forms and CSS**

HTML Forms (input, select, textarea, button, datalist), Input types (text, password, submit, radio, checkbox, date, email), Input attributes (value, readonly, disabled, maxlength, autocomplete, list, min, max, placeholder), HTML5 form validation (required and pattern attribute of input type), Applying style to html using CSS (Inline, Internal and External CSS, Colors, Fonts, Borders, Padding, Applying style using class and id attribute)

**(12 Hrs)**

**Unit III: Database Management System**

Database Management System (Introduction, Simplified DBMS structure, advantages of DBMS, Database Administrators, Designers, End Users, System Analysts and Application Programmers), Relational Data Model (Domains, Attributes, Tuples, Relations), Relational Data Model Constraints (Domain Constraints, Key Constraints) SQL Data Definition and Basic Data Types, Schema, DDL Statements (Create, Alter, Drop), Specifying Key Constraints in SQL, DML (Select, Insert, Update, Delete),

Ordering Tuples, Renaming Attributes, Substring Pattern Matching and Arithmetic Operators, Aggregate Functions in SQL, Group By and Having, Joins (Inner and Outer)

(18 Hrs)

#### **Unit IV: Introduction to PHP**

Introduction to PHP, PHP basics (Variable, data types, Constants, Operators), Flow control (if, switch, while, for), Functions, Strings, Arrays, Form Handling (GET and POST methods), Connecting php to a database.

(10 Hrs)

#### **Books for Study:**

1. Julie C. Meloni, HTML and CSS in 24 Hours, Sams Teach Yourself (Updated for HTML5 and CSS3), Ninth Edition
2. RamezElmasri, Shamkant B. Navathe, Fundamentals of Database Systems, 7th Edition, Pearson
3. <https://www.w3schools.com/php/>

#### **Books for Reference:**

1. Powell, Thomas A. HTML & CSS: The Complete Reference. McGraw Hill Education; 5 edition.
2. Silberschatz, Abraham, Henry F. Korth, and ShashankSudarshan. Database system concepts. McGraw-Hill.
3. PHP: The Complete Reference, Steven Holzner, McGraw Hill Education
4. <https://www.w3schools.com/css/>
5. <https://www.w3schools.com/html/>

#### **Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 12    |
| II   | 12    |
| III  | 20    |
| IV   | 8     |

**COMPLEMENTARY ELECTIVE COURSE IV: COMPUTATION USING  
PYTHON**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>4</b>        | <b>4C04CSC</b>     | <b>3</b>                  | <b>2</b>      | <b>3</b>            |

**COURSE OUTCOME**

**CO1:** Learn Python for expressing computation

**CO2:** Familiarize with functions and modules in python

**CO3:** Understand object-oriented programming concepts

**CO4:** Learn the techniques for data visualization in python

**Unit I: Basic Elements and Control Statements**

Features of Python, Different Methods to Run Python, Basic Elements (Objects, Expressions, Numerical Types, Strings, Variables), Comments, Indentation in Python, Input and Output in Python, import function, Operators in Python, Branching (if, else, elif), Iteration (while, for), range and enumerate functions, Tuples, Lists, Sets, Dictionaries, Built-in methods of lists, sets and dictionaries, Mutable and Immutable Objects.

**(16 Hrs)**

**Unit II: Functions, Modules and Exception Handling**

Functions Definition, Function Calling, Function Arguments (Required, Keyword, Default), Recursion, Modules, Built-in Modules (math, statistics), Creating Modules, File Handling (Opening, Closing, Writing, Reading), Exceptions, Built-in Exceptions (IndexError, OverflowError, ZeroDivisionError, RuntimeError), Exception Handling.

**(16 Hrs)**

**Unit III: Object Oriented Programming**

Class Definition, Object Creation, Built-in Attribute Methods, Encapsulation, Data Hiding, Inheritance, Multi-Level Inheritance, Polymorphism (Method Overriding, Operator Overloading)

**(10 Hrs)**

**Unit IV: Arrays and Data Visualization**

Arrays in Python, Numpy Module, ndarray, Creating Arrays (array, zeros, ones, empty, linspace, arrange, random), Two-Dimensional Array, Indexing, Slicing, Iterating,

Copying, Splitting, Shape Manipulation (reshape, transpose, resize), Arithmetic Operations on Arrays.

Data Visualization in Python (matplotlib Module, pyplot, plot(), hist, scatter, bar charts, Formatting, figure(), subplot(), text(), xlabel(), ylabel(), title(), Plotting Simple Mathematical Functions ( $\sin x$ ,  $x^2$ ))

(12 Hrs)

**Books for Study:**

1. Taming Python By Programming, Dr. Jeeva Jose, Khanna Publishing
2. Introduction to Computation and Programming Using Python with Application to Understanding Data - John V. Guttag, PHI (2016)
3. <https://www.numpy.org/devdocs/user/quickstart.html>
4. [https://matplotlib.org/users/pyplot\\_tutorial.html](https://matplotlib.org/users/pyplot_tutorial.html)

**Books for Reference:**

1. <https://www.tutorialspoint.com/python/>
2. Introduction to Computer Science using Python - Charles Dierbach, Wiley (2015)
3. Python for Education by Ajith Kumar B P
4. <https://docs.python.org/3/tutorial/index.html>
5. Introduction to Computer Science and Programming Using Python Provided by Massachusetts Institute of Technology (MITx) - Available at :  
(<https://www.edx.org/course/introduction-to-computer-science-and-programming-using-python-2>)

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 15    |
| 2    | 15    |
| 3    | 10    |
| 4    | 12    |

**COMPLEMENTARY ELECTIVE COURSE V: LAB 1 – PROGRAMMING IN C,  
WEB PROGRAMMING AND PYTHON PROGRAMMING**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>4</b>        | <b>4C05CSC</b>     | <b>2*</b>                 | <b>4</b>      | <b>3</b>            |

\*Lab will be conducted for 2 hours each in I, II, III and IV semesters

**COURSE OUTCOME**

**CO1:** Achieve skills to use C language for problem solving

**CO2:** Understand SQL and basic web programming

**CO3:** Achieve skills to use Python for problem solving

**Part I: C Programming**

1. Write a program to receive an angle in degrees and check whether sum of the squares of sines and cosines of the angle is equal to 1. (Hint: Convert the angle in degrees to radians and apply mathematical functions).
2. Write a C program to check whether a year entered through the keyboard is leap year or not.
3. Write a program to reverse the digits of a positive integer number up to 5 digits. Display an error message if any other number is entered.
4. Write a program to enter numbers till the user wants. At the end, it should display the count of positive, negative and zeros entered.
5. Given the value of n, write a program to generate n Fibonacci numbers.
6. Create a menu driven calculator using switch statement. The menu should contain options for Addition, Subtraction, Multiplication, Division and Exit. The program should end only when the user enters the choice as Exit.
7. Create function which takes an integer value as parameter and returns 1 if the number is prime and 0 otherwise. Write a program which uses this function to generate first 100 prime numbers.
8. Write a program using recursion to find the factorial of a number.
9. Write a program to sort n numbers in ascending/descending order.
10. Write a program to check whether a string is palindrome or not.
11. Write a program to add two matrices. Display an error message if the matrices cannot be added due to incompatibility.

12. Create a structure student with membersroll\_no, name and year\_of\_admn. Write a program to read n students into an array of the structure student. Write a function which takes year as argument and displays the names of students who joined that year. Get an input year from the user and display the student list using this function. (Hint: Make student array and number of students as global variables).

### **Part II: DBMS and Web Programming**

To be updated

### **Part II: Python Programming**

To be updated

## PART C

### B.S.C. COMPUTER SCIENCE GENERIC ELECTIVE COURSES WORK AND CREDIT DISTRIBUTION (2019 ADMISSION ONWARDS)

STUDENTS OF OTHER DEPARTMENTS CAN CHOOSE ANY ONE OF THE GENERIC ELECTIVE COURSES FROM THE POOL OF FIVE COURSES.

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                       | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> | <b>MARKS (INTERNAL + EXTERNAL)</b> |
|--------------------|-------------------------------------------|-----------------|-----------------------|---------------|-------------------|------------------------------------|
| 5D01CSC            | PROGRAMMING IN C                          | 5               | 2                     | 2             | 2                 | 5+20                               |
| 5D02CSC            | WEB TECHNOLOGY                            | 5               | 2                     | 2             | 2                 | 5+20                               |
| 5D03CSC            | DATABASE MANAGEMENT SYSTEM                | 5               | 2                     | 2             | 2                 | 5+20                               |
| 5D04CSC            | FUNDAMENTALS OF COMPUTERS AND PROGRAMMING | 5               | 2                     | 2             | 2                 | 5+20                               |
| 5D05CSC            | INTRODUCTION TO PYTHON PROGRAMMING        | 5               | 2                     | 2             | 2                 | 5+20                               |

### EVALUATION

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> |
|-------------------|------------------|
| EXTERNAL          | 4                |
| INTERNAL          | 1                |

### CONTINUOUS INTERNAL ASSESSMENT FOR THEORY

| <b>COMPONENT</b>                            | <b>WEIGHTAGE</b> | <b>REMARKS</b>                                                                                                                                                  |
|---------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COMPONENT1:<br>TEST                         | 80%              | MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE BEST TWO MARKS OBTAINED IN THE TESTS CONDUCTED. |
| COMPONENT 2:<br>ASSIGNMENT/<br>SEMINAR/VIVA | 20%              | ANY ONE COMPONENT                                                                                                                                               |

**PATTERN OF QUESTION PAPER FOR END SEMESTER ASSESSMENT**

|                                         |                        |                                         |
|-----------------------------------------|------------------------|-----------------------------------------|
| <b>Part A</b>                           | <b>Short Answer</b>    | <b>6 Questions x 1 Mark = 6 Marks</b>   |
|                                         | Answer all questions   | 6 Questions x 1 Mark = 6 Marks          |
| <b>Part B</b>                           | <b>Short Essay</b>     | <b>6 Questions x 2 Marks = 12 Marks</b> |
|                                         | Answer any 4 questions | 4 Questions x 2 Marks = 8 Marks         |
| <b>Part C</b>                           | <b>Essay</b>           | <b>2 Questions x 6 Marks = 12 Marks</b> |
|                                         | Answer any 3 questions | 1 Question x 6 Marks = 6 Marks          |
| <b>Total Marks Including Choice: 30</b> |                        |                                         |
| <b>Maximum Marks for the Course: 20</b> |                        |                                         |



**GENERIC ELECTIVE COURSE I: 5D01CSC PROGRAMMING IN C**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 5        | 5D01CSC     | 2              | 2      | 2        |

**COURSE OUTCOME**

**CO1:** To understand the basic knowledge of programming

**CO2:** To develop C programs

**CO3:** To develop skill in advanced program constructs

**CO4:** To develop skill in programming

**Unit I:**

Importance of C, C Tokens: Keywords, Identifiers, Constants, Operators- arithmetic operators, relational operator, logical operators and assignment operator. Fundamental data types, declaration of variables.

**(8Hrs)**

**Unit II:**

Data input and output functions: getchar(), putchar(), scanf(), printf(). Control statements: Branching: if, if-else, else...if ladder. Looping: while, do while and for loops.

**(12Hrs)**

**Unit III:**

Arrays: Introduction to Arrays - one dimensional array and two-dimensional arrays. Strings: basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat, strrev.

Functions: function declaration (prototype), function definition and calling a function. Recursion.

**(10Hrs)**

**Unit IV:**

Pointer: pointer declaration and initialization. Structures: structure definition, structure variable declaration, Initialization of structure variable, accessing a structure member.

**(6Hrs)**

**Books for Study:**

1. ANSI C, E. Balagurusamy, 3rd edition McGraw-Hill Publication

**Books for Reference:**

1. Programming with ANSI and Turbo C, Ashok N. Kamthane, 1edn, Pearson Education.
2. Programming with C in Linux, NIIT, PHI.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 6     |
| II   | 10    |
| III  | 10    |
| IV   | 4     |

**GENERIC ELECTIVE COURSE II: 5D02CSC Web Technology**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>5</b>        | <b>5D02CSC</b>     | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**COURSE OUTCOME**

**CO1:** To understand the knowledge of HTML

**CO2:** To understand the knowledge of various HTML tags

**CO3:** To enable students to program for the World Wide Web using HTML

**CO4:** To understand the basic knowledge of Java Script

**Unit I: HTML Basics**

Introduction to WWW and HTML, Steps for hosting a website, Structure of HTML, HTML elements and attributes, Headings, Paragraphs, Formatting tags, line breaks, Comments, Links, Images, Lists, HTML5 Semantic Elements (header, footer, nav, section, article, nav, aside).

**(8 Hrs)**

**Unit II: HTML Tables and Forms**

HTML Tables, HTML Forms (input, select, textarea, button, datalist), Input types (text, password, submit, radio, checkbox, date, email), Input attributes (value, readonly, disabled, maxlength, autocomplete, list, min, max, placeholder)

**(12 Hrs)**

**Unit III: CSS**

HTML5 form validation (required and pattern attribute of input type), Applying style to html using CSS (Inline, Internal and External CSS, Colors, Fonts, Borders, Padding, Applying style using class and id attribute).

**(6 Hrs)**

**Unit IV: JavaScript**

JavaScript: Introduction, data types, variables, operators, functions, arrays. Dialog boxes: Alert, confirm and prompt dialog boxes

**(10 Hrs)**

**Books for Study:**

1. Julie C. Meloni, HTML and CSS in 24 Hours, Sams Teach Yourself (Updated for HTML5 and CSS3), Ninth Edition
2. Javascript-Definitive Guide O'reilley 6th edn

**Books for Reference:**

1. Powell, Thomas A. HTML & CSS: The Complete Reference. McGraw Hill Education; 5 edition.
2. <https://www.w3schools.com/css/>
3. <https://www.w3schools.com/html/>

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 8     |
| II   | 8     |
| III  | 6     |
| IV   | 8     |

**GENERIC ELECTIVE COURSE III: 5D03CSC DATABASE MANAGEMENT SYSTEM**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>5</b>        | <b>5D03CSC</b>     | <b>2</b>              | <b>2</b>      | <b>2</b>        |

**COURSE OUTCOME**

**CO1:** To understand the fundamentals of database management system

**CO2:** To develop Skill in designing database

**CO3:** To understand the concept of SQL commands

**CO4:** To develop Skill in writing queries

**Unit I:**

Introduction: Advantages of database systems, View of Data, data models (Network model, Hierarchical model, Relational model). Field, Record, Entity, Attribute, Relation, Domain, Tuple.

**(8 Hrs)**

**Unit II:**

Database Administrator, data base users, E-R model: basic concept, E-R diagram. Constraints: Primary key, not null, foreign key and Unique. Relational Algebra (Union, Intersection, Difference, Product, Project and Selection).

**(10Hrs)**

**Unit III:**

SQL: Introduction to SQL, database languages, DDL(create, alter, Drop), DML(Insert into, Select, update, Delete) and DCL commands. Data Types in SQL

**(8Hrs)**

**Unit IV:**

SQL Functions: aggregate, number, date and character functions. Operators (Arithmetic, Relational, Logical), Sub Queries (in Detail), Clauses (Having, Group By), Joins (Different Types of Join Statements), View, Introduction to Sequence.

**(10 Hrs)**

**Books for Study:**

1. Data Base Concept 3rd edition Abraham Silberschatz, Henery f Korth McGraw Hill
2. A Guide to the SQL Standard, C. J. Date and Hugh Darwen, 1997, Addison-Wesley

**Books for Reference:**

1. An Introduction to Database Systems, C. J. Date, 1994, Addison-Wesley
2. Understanding the New SQL, Jim Melton and Alan R. Simon, 1993, Morgan Kaufmann

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 5     |
| II   | 9     |
| III  | 8     |
| IV   | 8     |

**GENERIC ELECTIVE COURSE IV: 5D04CSC FUNDAMENTALS OF  
COMPUTERS AND PROGRAMMING**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>5</b>        | <b>5D04CSC</b>     | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**COURSE OUTCOME**

- CO1:** To know the working principle of a computer  
**CO2:** To understand the concept of number system  
**CO3:** To understand the basics of computer network  
**CO4:** To understand the basics of programming

**Unit I:**

Introduction to Computers: Characteristics, Generation, Basic operations of a computer system: Inputting, storing, processing, outputting and controlling, CPU, ALU, Control Unit, Main Memory Unit, Secondary storage devices: tape, floppy, hard disk, CD, DVD.

**(12Hrs)**

**Unit II:**

Representation of information: Number system: binary, octal and hexadecimal system, Conversion: decimal to binary, decimal to octal, decimal to hexadecimal, binary to decimal, octal to decimal and hexadecimal to decimal, Different code used: BCD, ASCII, EBCDIC, and GRAY Code.

**(8Hrs)**

**Unit III:**

Introduction to Computer networking: Goals, Transmission modes: simplex, half duplex and full duplex, Classification of networks: LAN, MAN and WAN, Topologies: bus, star, ring, and mesh.

**(8 Hrs)**

**Unit IV:**

Computer Programming: Introduction, algorithm, flowchart, characteristics of a good program. Programming languages: machine, assembly and high-level languages, Assembler, Compiler and Interpreter. Source code and object code.

**(8Hrs)**

**Books for Study:**

1. Computer Fundamentals, Pradeep.K. Sinha&PritiSinha, BPB Pub
2. Introduction to Information Technology, V. Rajaraman, Prentice Hal
3. Computer Networks 3rd Edn, A S Tanenbaum . Pearson Pub

**Books for Reference:**

1. Peter Norton, Introduction to Computers,6e, (Indian Adapted Edition)
2. B Forouzan, Introduction to data communication and networking

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 9     |
| II   | 6     |
| III  | 8     |
| IV   | 7     |



**GENERIC ELECTIVE COURSE IV: 5D05CSC INTRODUCTION TO PYTHON  
PROGRAMMING**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| 5               | 5D05CSC            | 2                         | 2             | 2                   |

**COURSE OUTCOME**

**CO1:** Learn Python for expressing computation

**CO2:** Learn about program control statements in python

**CO3:** Familiarize with functions and modules in python

**CO4:** Learn the techniques for data visualization in python

**Unit I:**

Features of Python, Different Methods to Run Python, Basic Elements (Objects, Expressions, Numerical Types, Strings, Variables), Comments, Indentation in Python, Input and Output in Python, import function, Operators in Python.

**(12 Hrs)**

**Unit II:**

Branching (if, else, elif), Iteration (while, for), range and enumerate functions, Tuples, Lists, Sets, Dictionaries, Built-in methods of lists, sets and dictionaries, Mutable and Immutable Objects.

**(8 Hrs)**

**Unit III:**

Functions Definition, Function Calling, Function Arguments (Required, Keyword, Default), Recursion, Modules, Built-in Modules (math, statistics), Creating Modules, File Handling (Opening, Closing, Writing, Reading), Exceptions, Built-in Exceptions (IndexError, OverflowError, ZeroDivisionError, RuntimeError), Exception Handling.

**(8 Hrs)**

**Unit IV:**

Arrays in Python, Numpy Module, ndarray, Creating Arrays (array, zeros, ones, empty, linspace, arrange, random), Two-Dimensional Array, Indexing, Slicing, Iterating, Copying, Splitting, Shape Manipulation (reshape, transpose, resize), Arithmetic Operations on Arrays.

Data Visualization in Python (matplotlib Module, pyplot, plot(), hist, scatter, bar charts, Formatting, figure(), subplot(), text(), xlabel(), ylabel(), title(), Plotting Simple Mathematical Functions ( $\sin x$ ,  $x^2$ ).

(8 Hrs)

**Books for Study:**

1. Computer Fundamentals, Pradeep.K. Sinha&PritiSinha, BPB Pub
2. Introduction to Information Technology, V. Rajaraman, Prentice Hal
3. Computer Networks 3rd Edn, A S Tanenbaum . Pearson Pub

**Books for Reference:**

1. Peter Norton, Introduction to Computers,6e, (Indian Adapted Edition)
2. B Forouzan, Introduction to data communication and networking

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 5     |
| II   | 10    |
| III  | 10    |
| IV   | 5     |

# **Model Question Papers**

**Model Question Paper**  
**1B01CSC Introduction to C Programming**

**Time: 3 Hours**

**Max. Marks: 40**

**Part A: Short Answer**

**Answer all questions**

**(6 x 1 = 6 Marks)**

1. What are the advantages of arrays?
2. Define the term algorithm
3. Explain the purpose of getchar() function
4. What is source code?
5. What is a keyword?
6. Define the term string.

**Part B: Short Essay**

**Answer any 6 questions**

**(6 x 2 = 12 Marks)**

7. Which function is used to read a line of text in C?
8. Write notes on limitations of flowchart
9. Explain switch statement in C.
10. Explain the working of increment Operator with an example
11. Explain go-to statement in detail
12. Explain the basic structure of C language.
13. Explain working of strcmp() function.
14. How do you initialize an array in C? explain with suitable examples

**Part C: Essay**

**Answer any 4 questions**

**(4 x 3 = 12 Marks)**

15. Explain benefits of flowchart.
16. Write notes on conditional operator with an example program.
17. Write a program to perform matrix addition.
18. Write a program to print prime numbers within range.
19. Explain the difference between while and do-while loop in detail.
20. Write algorithm to find the largest number among three numbers.

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

21. Write an algorithm and flowchart to swap two Numbers without using temporary variable.
22. Write detailed note on data types in C language.
23. Explain about the looping statements in C.
24. Explain string-handling functions in detail.

**Model Question Paper**  
**3B04CSC Data Structures**

**Time: 3 Hours**

**Max. Marks: 40**

**Part A: Short Answer**

**Answer all questions**

**(6 x 1 = 6 Marks)**

1. Define Data Structure.
2. What do you mean by Deque?
3. Full Binary Tree – Define.
4. Define Adjacency Matrix.
5. What is ADT?
6. Write the complexity of Bubble sort.

**Part B: Short Essay**

**Answer any 6 questions**

**(6 x 2 = 12 Marks)**

7. Write a short note on polynomial representation using arrays.
8. Describe the advantages of Two-way list.
9. Write a short note on Post Fix expression.
10. Write a short note on computer representation of general trees.
11. Explain about sequential representation of graphs.
12. Define and explain - algorithms.
13. Differentiate Data Structure and Abstract Data type.
14. Write a short note on linear search.

**Part C: Essay**

**Answer any 4 questions**

**(4 x 3 = 12 Marks)**

15. Explain push operation in stack with the support of example.
16. Write a detailed note on representation of linked list in memory.
17. Differentiate Complete Binary Tree and Extended Binary Tree.
18. How can I insert an item into a graph? Explain.
19. Explain about measuring of running time of a program.
20. Sort the following data set using selection sort – 10,5,8,2,12,6.

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

21. Write in detail about Queue Data Structure.
22. Describe Binary Search tree in detail.
23. Explain the functioning of BFS algorithm with the support of example.
24. Write a detailed note on insertion sort algorithm and explain with example.

**Model Question Paper**  
**5B08CSC Web Technology**

**Time: 3 Hours**

**Max. Marks: 40**

**Part A: Short Answer**

**Answer all questions**

**(6 x 1 = 6 Marks)**

1. Describe the difference between client-side programming and server-side programming.
2. Give the syntax to embed JavaScript code into the web document.
3. How can we add comments to a web document?
4. What is the importance of PHP?
5. What is Ajax?
6. Define DOM.

**Part B: Short Essay**

**Answer any 6 questions**

**(6 x 2 = 12 Marks)**

7. Explain any two mouse events.
8. Write a note on WWW.
9. What are the different types of heading available in HTML5?
10. What is meant by page structure element?
11. What are the different parts of a URL?
12. What is the function of AJAX?
13. What are the arithmetic operators used in JavaScript?
14. Write a short note on string object in JavaScript.

**Part C: Essay**

**Answer any 4 questions**

**(4 x 3 = 12 Marks)**

15. What are the types of data used in PHP?
16. What is meant by dialog boxes? Explain with various types of dialog boxes.
17. What are the different types of lists possible in HTML 5?
18. What are the different types of web hosting?
19. Differentiate between traditional Web Applications and Ajax Applications
20. How can we insert an image into your web page?

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

21. Explain forms and various tags associated with it.
22. What is recursion? How is it implemented in JavaScript?
23. Define array. Explain the declaration and usage of arrays in JavaScript with example.
24. How can we process forms using PHP? Explain in detail

**Model Question Paper**  
**5B09CSC Java Programming**

**Time: 3 Hours**

**Max. Marks: 40**

**Part A: Short Answer**

**Answer all questions**

**(6 x 1 = 6 Marks)**

1. Define Byte code.
2. What do you mean by Auto boxing?
3. Define DMD.
4. Define this keyword.
5. What is chained exception?
6. Define Applet.

**Part B: Short Essay**

**Answer any 6 questions**

**(6 x 2 = 12 Marks)**

7. Write a short note on short circuit operators in java.
8. Describe the advantages of arrays in java.
9. Write a short note on static method.
10. Explain the uses of super keyword.
11. Briefly explain exception handling in Java.
12. Explain labeled break and labeled continue.
13. What is synchronization in Java?
14. Explain two ways to create threads.

**Part C: Essay**

**Answer any 4 questions**

**(4 x 3 = 12 Marks)**

15. Explain three uses of final keyword.
16. With an example explain DMD.
17. Write a Java program to print the elements of an integer array with recursion.
18. How to create user-defined packages in Java?
19. Explain bitwise operators.
20. Distinguish abstract class and interfaces in Java.

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

21. Write in detail of fundamental Data types.
22. Describe packages and interfaces.
23. Explain applet skeleton and applet tags.
24. Write an applet program to draw a string when an awt Button is pressed.

**Model Question Paper**  
**5B10CSC Computation Using Python**

**Time: 3 Hours**

**Max. Marks: 40**

**Part A: Short Answer**

**Answer all questions**

**(6 x 1 = 6 Marks)**

1. Give syntax for function definition in python.
2. What are built-in attribute methods.
3. What is the purpose of zeros function in numpy module?
4. Explain the use of linspace function in numpy with an example?
5. What is meant by widget in Tkinter?
6. Give syntax for connecting to a database in python.

**Part B: Short Essay**

**Answer any 6 questions**

**(6 x 2 = 12 Marks)**

7. What are the different methods to run python?
8. What is the difference between mutable and immutable objects in python?
9. How a module can be created? Give an example.
10. Write a recursive function in python to find the n<sup>th</sup> Fibonacci number and use it to generate a Fibonacci series of required numbers.
11. Explain about built-in exceptions in python.
12. How a class is defined? Explain with an example.
13. Explain 2 different methods for changing the shape of an array.
14. Explain about message widget.

**Part C: Essay**

**Answer any 4 questions**

**(4 x 3 = 12 Marks)**

15. Explain about sets in python.
16. Explain about branching statements in python.
17. How python can be used to write in to a file? Explain with an example.
18. Explain how operator overloading can be done in python with an example.
19. Explain how transaction control can be done in python.
20. Explain about pack layout manger.

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

21. Explain in detail about lists and dictionaries in python.
22. Explain about exception handling in python.
23. What are the object-oriented programming features of python?
24. Explain about 5 widgets in Tkinter.



**Model Question Paper**  
**5B11CSC-A Algorithm Designing**

**Time: 3 Hours**

**Max. Marks: 40**

**Part A: Short Answer**

**Answer all questions**

**(6 x 1 = 6 Marks)**

1. Define divide and Conquer method.
2. What is partitioning.
3. Define spanning tree.
4. What do you mean by job sequencing with deadlines problem?
5. Define path.
6. Write about Hamiltonian Cycle.

**Part B: Short Essay**

**Answer any 6 questions**

**(6 x 2 = 12 Marks)**

7. How Binary Search is a Divide and Conquer method algorithm?
8. Discuss the performance of Quick sort algorithm.
9. Define greedy method.
10. What do you mean by single source shortest path?
11. What is 0/1 knapsack.
12. Describe all pairs shortest path.
13. What is 8 queens' problem.
14. Write a short note on back tracking.

**Part C: Essay**

**Answer any 4 questions**

**(4 x 3 = 12 Marks)**

15. Explain Binary Search in terms of divide and conquer.
16. Do merge sort in following data set: 34,78,26,5,92,4,71,8
17. Explain knapsack problem.
18. What is single source shortest path.
19. Write a note on dynamic programming.
20. Explain sum of subsets problem.

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

21. Explain Strassen's Matrix Multiplication Algorithm.
22. Describe Prim's algorithm with the support of an example.
23. Write a detailed note on multistage graph.
24. Explain graph coloring problem in detail.

**Model Question Paper**  
**6B12CSC Data Communication and Computer Networking**

**Time: 3 Hours**

**Max. Marks: 40**

**Part A: Short Answer**

**Answer all questions**

**(6 x 1 = 6 Marks)**

1. What is meant by network topology?
2. Give examples for network hardware.
3. What is bit stuffing.
4. Mention 2 services provided by network layer.
5. What is a LAN?
6. What is the need of flow control?

**Part B: Short Essay**

**Answer any 6 questions**

**(6 x 2 = 12 Marks)**

7. What are the design issues of network layer?
8. What is meant by congestion?
9. List the file transfer protocols.
10. What is the need of error control?
11. What is meant by character stuffing?
12. Explain simplex transmission.
13. What is meant by parallel transmission?
14. What is service point addressing?

**Part C: Essay**

**Answer any 4 questions**

**(4 x 3 = 12 Marks)**

15. Compare between TCP and UDP.
16. Explain flow-based routing.
17. Explain Framing.
18. What are the functions of presentation layer?
19. Briefly explain unicast, multicast and broadcast.
20. Explain about leaky bucket algorithm.

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

21. Explain ISO-OSI reference model.
22. List and explain elementary protocols used in DLL.
23. Explain different types of routing.
24. Explain the various transmission media.

**Model Question Paper  
6B13CSC Compiler Design**

**Time: 3 Hours**

**Max. Marks: 40**

**Part A: Short Answer**

**Answer all questions**

**(6 x 1 = 6 Marks)**

1. What are compiler construction tools?
2. What is a symbol table?
3. Define preprocessor.
4. What is meant by instruction cost in code generation?
5. What is activation record?
6. What is basic block?

**Part B: Short Essay**

**Answer any 6 questions**

**(6 x 2 = 12 Marks)**

7. Define compiler.
8. What are the phases of analyzing a source program?
9. What is the role of lexical analyzer in compiler?
10. Define tokens. Give example.
11. What is syntax error? Give example.
12. Write a short note operator precedence parsing.
13. What are the structure preserving transformations?
14. Write a short note on peephole optimization?

**Part C: Essay**

**Answer any 4 questions**

**(4 x 3 = 12 Marks)**

15. What is meant by semantic analysis?
16. Define regular expression with an example.
17. Define DFA.
18. Briefly explain the working of a parser.
19. Explain ambiguity of grammar.
20. What are the different types of intermediate representation?

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

21. Explain top down parsing in detail.
22. Explain lexical analyzer.
23. Explain the phases of a compiler.
24. Explain code optimization.

**Model Question Paper  
6B15CSC-B Data Mining**

**Time: 3 Hours**

**Max. Marks: 40**

**Part A: Short Answer**

**Answer all questions**

**(6 x 1 = 6 Marks)**

1. Define Data Warehouse.
2. List the distinct features of OLAP and OLTP.
3. List out the major tasks done in Data Preprocessing.
4. What is Data Integration?
5. What is a Decision Tree?
6. List out the stages of KDD.

**Part B: Short Essay**

**Answer any 6 questions**

**(6 x 2 = 12 Marks)**

7. What is CLARANS?
8. How Data Warehouse differ from Heterogeneous Database Management System?
9. Explain about different OLAP operations
10. What is Multi-Dimensional data model. Give example.
11. Why we need Data transformation. Mention the ways by which data can be transformed.
12. What is Categorical Clustering?
13. What is Clustering?
14. What is the need of Data Preprocessing?

**Part C: Essay**

**Answer any 4 questions**

**(4 x 3 = 12 Marks)**

15. Explain about Data Warehouse Architecture.
16. Explain Apriori algorithm.
17. Differentiate CLARA and CLARANS.
18. Explain the working of K-Means algorithm.
19. Discuss in detail about the concept of Spatial Data Mining
20. Discuss about the Decision Tree Construction Principles.

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

21. Explain in detail about Partitioned Algorithms.
22. Explain in detail about Data Preprocessing.
23. Discuss about
  - a. FP Tree Growth Algorithms
  - b. Data Warehouse Backend Process
24. Explain about Density-Based Algorithms and STIRR.

**Model Question Paper**  
**1C01CSC Introduction to Computers and Programming**

**Time: 3 Hours**

**Max. Marks: 32**

**Part A: Short Answer**

**Answer all questions**

**(5 x 1 = 5 Marks)**

1. What is the function of BIOS?
2. Give two types of secondary memory.
3. Find the 2's complement of  $10110011_2$ .
4. What is meant by open source software?
5. What is a Compiler?

**Part B: Short Essay**

**Answer any 4 questions**

**(4 x 2 = 8 Marks)**

6. Write short note about ALU.
7. Explain about SRAM.
8. Explain about ASCII code.
9. What is BCD? Explain with an example?
10. What is an algorithm? Explain with an example.
11. What are the characteristics of a good program?

**Part C: Essay**

**Answer any 3 questions**

**(3 x 3 = 9 Marks)**

12. Explain about different types of ROM.
13. What are the characteristics of a computer?
14. Convert the following numbers as indicated.
  - a.  $234_{10}$  to binary
  - b.  $110011.101_2$  to decimal
  - c.  $1245_8$  to hexadecimal
15. What are the uses of computer networks?
16. Explain about program development life cycle?

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

17. Explain about basic hardware components of a computer system with a diagram.
18. Explain about different number systems with examples.
19. Explain about functions of an operating system.
20. Explain about different program control structures.

**Model Question Paper**  
**2C02CSC Programming in C**

**Time: 3 Hours**

**Max. Marks: 32**

**Part A: Short Answer**

**Answer all questions**

**(5 x 1 = 5 Marks)**

1. What is a keyword? Give an example.
2. What is a type declaration instruction in C?
3. What is an escape sequence character? Give an example.
4. Explain about library function.
5. Explain how a one-dimensional array can be declared with an example.

**Part B: Short Essay**

**Answer any 4 questions**

**(4 x 2 = 8 Marks)**

6. Write a C program to find the greatest of three numbers entered through the keyboard.
7. Explain about break and continue statements with an example.
8. Write a recursive function to find the factorial of a number.
9. What are the advantages of using functions in a program?
10. Write a short note about two-dimensional arrays.
11. What are C Preprocessors? Give examples.

**Part C: Essay**

**Answer any 3 questions**

**(3 x 3 = 9 Marks)**

12. Explain about different types of constants in C.
13. Differentiate between while and do-while statements with an example.
14. Explain about switch statement in C with an example.
15. Write a short note about pointers in C.
16. Explain about different methods for passing parameter to functions in C.

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

17. Explain about different types of operators in C.
18. Explain about different forms of if statement.
19. Explain about different storage classes in C.
20. What are strings? Explain in detail about standard string handling functions in C.

**Model Question Paper**  
**3C03CSC Web Technology with Database Management System**

**Time: 3 Hours**

**Max. Marks: 32**

**Part A: Short Answer**

**Answer all questions**

**(5 x 1 = 5 Marks)**

1. How hyperlinks can be created in a HTML page?
2. What are the heading tags in HTML?
3. What is meant by database schema?
4. How tuples of a select query can be ordered based on an attribute?
5. What is the purpose of GET method in an HTML form?

**Part B: Short Essay**

**Answer any 4 questions**

**(4 x 2 = 8 Marks)**

6. Explain about formatting tags in HTML.
7. Explain about any 2 semantic elements in HTML5.
8. Explain about inline, internal and external css styling.
9. Write short note about datalist tag in HTML with an example.
10. Explain about CREATE TABLE statement with an example.
11. Explain how user defined functions are created in php with an example.

**Part C: Essay**

**Answer any 3 questions**

**(3 x 3 = 9 Marks)**

12. Explain about different lists in HTML.
13. Explain how tables can be created in HTML with an example.
14. Explain about HTML5 form validation techniques.
15. Explain about different aggregate functions in SQL.
16. Explain briefly about relational data model.

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

17. Explain in detail about different form elements, input types and attributes.
18. Explain in detail about advantages of DBMS.
19. Explain about different types of joins in SQL.
20. Design an HTML page which contains a form for accepting basic student details. Explain how this form data can be stored in a database table using php.

**Model Question Paper**  
**4C04CSC Computation Using Python**

**Time: 3 Hours**

**Max. Marks: 32**

**Part A: Short Answer**

**Answer all questions**

**(5 x 1 = 5 Marks)**

1. Explain about input function in python.
2. Give syntax for function definition in python.
3. What is meant by exception? Give an example.
4. What is the purpose of zeros function in numpy module?
5. Explain the use of linspace function in numpy with an example?

**Part B: Short Essay**

**Answer any 4 questions**

**(4 x 2 = 8 Marks)**

6. What are the different methods to run python?
7. What is the difference between mutable and immutable objects in python?
8. Explain for loop in python with an example.
9. Explain about any two functions in math module.
10. How a class is defined? Explain with an example.
11. Explain 2 different methods for changing the shape of an array.

**Part C: Essay**

**Answer any 3 questions**

**(3 x 3 = 9 Marks)**

12. Explain about sets in python.
13. How python can be used to write in to a file? Explain with an example.
14. Explain about different types of function arguments in python.
15. What is operator overloading? Explain with an example.
16. Write a python program to plot the mathematical function  $x^2$ .

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

17. Explain in detail about lists and dictionaries in python.
18. Explain about exception handling in python.
19. What are the object-oriented programming features of python?
20. Explain about different data visualization techniques in python. Write python program for plotting the mathematical function  $\sin x$ .



**Model Question Paper**  
**5D01CSC Programming in C**

**Time: 2 Hrs**

**Max Marks: 20**

**Part A (Short Answer)**

**Answer All Questions**

**(6 x 1 = 6)**

1. What is keyword?
2. What is the use of getchar()?
3. Define array.
4. What is function prototype?
5. What is pointer?
6. What is structure?

**Part B (Short Essay)**

**Answer Any FOUR Questions**

**(4 x 2 = 8)**

7. Explain fundamental data types.
8. Explain about arithmetic and relational operators.
9. Write the syntax of if-else statement.
10. Explain recursion.
11. Explain about for loop?
12. How structure variables are initialized and accessed? Explain with example.

**Part C (Essay)**

**Answer Any ONE Questions**

**(1 x 6 = 6)**

13. Explain looping statements in C with example.
14. Explain any four string handling functions in C with example.

**Model Question Paper**  
**5D02CSC Web Technology**

**Time: 2 Hrs**

**Max Marks: 20**

**Part A (Short Answer)**

**Answer All Questions**

**(6 x 1 = 6)**

1. How images can be added in an HTML page?
2. What is the use of <a> tag in HTML?
3. What are the different heading tags in HTML?
4. Give 2 examples for semantic tags.
5. What is the use of password input in an HTML form?
6. What is a checkbox in an HTML form?

**Part B (Short Essay)**

**Answer Any FOUR Questions**

**(4 x 2 = 8)**

7. Explain about lists in HTML.
8. Explain about structure of an HTML document.
9. Explain about HTML form validation.
10. Explain about inline, internal and external css styling.
11. Explain about data list and list attribute with an example.
12. Explain about confirm and prompt boxes in java script.

**Part C (Essay)**

**Answer Any ONE Questions**

**(1 x 6 = 6)**

13. What is meant by Table? What are the tags used for table creation? What are the different attributes? Illustrate with an example.
14. Explain different types of operators in java script.

**Model Question Paper**  
**5D03CSC Database Management System**

**Time: 2 Hrs**

**Max Marks: 20**

**Part A (Short Answer)**

**Answer All Questions**

**(6 x 1 = 6)**

1. What is tuple?
2. Define primary key.
3. What are DDL commands?
4. What is sequence?
5. What is the use of delete command?
6. List the arithmetic operators in SQL.

**Part B (Short Essay)**

**Answer Any FOUR Questions**

**(4 x 2 = 8)**

7. Explain the advantages of DBMS.
8. Write a note on relational model.
9. Explain the functions of DBA.
10. Explain update command.
11. Explain about insert command.
12. Explain about data types in SQL.

**Part C (Essay)**

**Answer Any ONE Questions**

**(1 x 6 = 6)**

13. Explain about relational algebra operations.
14. Explain various SQL functions with suitable examples.

**Model Question Paper**  
**5D04CSC Fundamentals of Computers and Programming**

**Time: 2 Hrs**

**Max Marks: 20**

**Part A (Short Answer)**

**Answer All Questions**

**(6 x 1 = 6)**

1. What is gray code?
2. What is ASCII?
3. What are secondary storage devices?
4. What is flowchart?
5. Define algorithm.
6. What is source code?

**Part B (Short Essay)**

**Answer Any FOUR Questions**

**(4 x 2 = 8)**

7. Explain the function of CPU.
8. Explain BCD.
9. Converts the decimal number 256 to binary.
10. Explain transmission modes.
11. Differentiate compiler and interpreter.
12. Explain the characteristics of a good program.

**Part C (Essay)**

**Answer Any ONE Questions**

**(1 x 6 = 6)**

13. Explain the generations of a computer.
14. Explain network topologies.

**Model Question Paper**  
**5D05CSC Introduction to Python Programming**

**Time: 2 Hrs**

**Max Marks: 20**

**Part A (Short Answer)**

**Answer All Questions**

**(6 x 1 = 6)**

1. Explain about input function in python.
2. Give syntax for function definition in python.
3. What is meant by exception? Give an example.
4. What is the function of zeros function in numpy module?
5. Explain plot function.
6. Explain the use of linspace function in numpy with an example.

**Part B (Short Essay)**

**Answer Any FOUR Questions**

**(4 x 2 = 8)**

7. What are the different methods to run python?
8. What is the difference between mutable and immutable objects in python?
9. Explain for loop in python with an example.
10. Explain about any two functions in math module.
11. Explain 2 different methods for changing the shape of an array.
12. Explain about any 2 operators in python.

**Part C (Essay)**

**Answer Any ONE Questions**

**(1 x 6 = 6)**

13. Explain in detail about lists and dictionaries in python.
14. Explain about exception handling in python.



**KANNUR UNIVERSITY**  
**(Abstract)**

Bachelor of Business Administration (BBA) Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

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**ACADEMIC BRANCH**

No.Acad.C1/12392/2019

Dated, Civil Station P.O.,22 .06. 2019

- 
- Read:-
1. U.O.No.Acad.C2/429/2017 dated,10-10-2017
  2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
  3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.
  4. The Minutes of the Meeting of the Board of Studies in Management Studies (UG) held on 07.06.2019
  5. Syllabus of BBA Programme , Submitted by the Chairperson, Board of Studies in Management Studies (UG), dated , 13.06.2019

**ORDER**

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.
2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies ,Workshops, discussions etc.
3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.
4. Subsequently, as per paper read (4) above, the Board of Studies in Management Studies (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core,

Complementary Elective & Generic Elective Course of BBA Programme to be implemented with effect from 2019 Admission.

5. Further, as per paper read (5) above, the Chairperson, Board of Studies in Management Studies (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of BBA Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Papers (Core/Complementary Elective/Generic Elective Course) of BBA Programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Papers of BBA Programme are uploaded in the University website ([www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in))

Orders are issued accordingly.

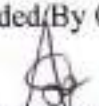
Sd/-  
DEPUTY REGISTRAR(ACADEMIC)  
For REGISTRAR

To  
The Principals of Colleges offering BBA Programme

- Copy to:-
1. The Examination Branch (through PA to CE)
  2. The Chairperson, Board of Studies in Management Studies (UG)
  3. PS to VC/PA to PVC/PA to Registrar
  4. DR/AR-I, Academic
  5. The Computer Programmer(for uploading in the website)
  6. SF/DF/FC



Forwarded/By Order

  
SECTION OFFICER



**KANNUR UNIVERSITY**

**BOARD OF STUDIES, Management Studies (UG)**

**BACHELOR OF BUSINESS ADMINISTRATION PROGRAMME**

**(BBA)**

**CHOICE BASED CREDIT AND SEMESTER SYSTEM**

**(CBCSS)**

**Under**

**Outcome Based Education**

**(OBE)**

**(2019 ADMISSION ONWARDS)**



## **Kannur University**

### **Vision and Mission Statement\***

**Proposed Vision:** To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady taluk of Wayanad Revenue District.

#### **Proposed Mission:**

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

**Kannur University**  
**Programme Outcomes**

**PO 1.Critical Thinking:**

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

**PO 2.Effective Citizenship:**

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.
3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

**PO 3.Effective Communication:**

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

**PO 4.Interdisciplinarity:**

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

## **Preface**

The BBA Programme aims at equipping the students with new ideas and changes in the sphere of business and management. It is imperative to update the syllabus to impart the latest developments in business world and changing the view of our students about the global changes.

In the light of UGC guidelines and Higher Education Council's directives, the programme curriculum has been revised to meet the requirements of the modern time. The present revision aims at familiarizing students with latest practices in management in the area of finance, human resource development and marketing. It also aims at acquiring skills in accounting and quantitative techniques in the areas of decision making and management, and building entrepreneurial spirit and competencies, and develops research aptitude.

**Dr. BINDU K**  
**Chairperson**  
**Board of Management Studies UG**

**BACHELOR OF BUSINESS ADMINISTRATION PROGRAMME (BBA)**

**Programme Specific Outcome**  
**of**  
**Bachelor of Business Administration Programme**

**PSO 1:**

**Gain knowledge and skills in the areas of Management principles and practices, finance, human resource management and marketing**

**PSO 2:**

**Acquire knowledge in accounting principles and practices and its application in real business settings**

**PSO 3:**

**Apply concepts, theories, tools and techniques of statistics, information techniques, economics and numerical skills for decision making**

**PSO 4:**

**Build entrepreneurial spirit, develop research attitude and entrepreneurial competencies and managerial abilities**

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**KANNUR UNIVERSITY**

**BBA PROGRAMME**

| <b>Credit and courses</b> |                                                                                                |                   |            |
|---------------------------|------------------------------------------------------------------------------------------------|-------------------|------------|
| Sl no                     | Category of course                                                                             | Number of courses | Credits    |
| 1                         | English Common course(ECC)                                                                     | 2×4 =8<br>2×3=6   | 14         |
| 2                         | Additional Common course(ACC)                                                                  | 2×4=8             | 8          |
| 3                         | General Awareness Course<br>Ability Enhancement Course (AEC)<br>Skill Enhancement Course (SEC) | 2×4=8<br>2×4=8    | 16         |
| 4                         | Core course(CC)<br>Discipline Specific Elective course (DSEC)                                  |                   | 64         |
| 5                         | Complementary elective Course(CEC)                                                             | 4×4=16            | 16         |
| 6                         | Generic Elective Course(GEC)                                                                   | 1×2=2             | 2          |
| <b>Total</b>              |                                                                                                |                   | <b>120</b> |

| Semester | Course Title*                                                                    | Type of Course | Credits | Hours per week | Total Credits | Total Hours |
|----------|----------------------------------------------------------------------------------|----------------|---------|----------------|---------------|-------------|
| I        | English Common Course I                                                          | ECC            | 4       | 5              | 22            | 25          |
|          | English Common Course II                                                         | ECC            | 3       | 4              |               |             |
|          | Additional Common Course I                                                       | ACC            | 4       | 5              |               |             |
|          | Core Course I.<br>Principles and Practices of Management                         | CC             | 3       | 3              |               |             |
|          | Complementary Elective Course 1<br>Statistics for business decisions             | CEC            | 4       | 4              |               |             |
|          | Complementary Elective Course 2<br>Managerial Economics                          | CEC            | 4       | 4              |               |             |
| II       | English Common Course III                                                        | ECC            | 4       | 5              | 21            | 25          |
|          | English Common Course IV                                                         | ECC            | 3       | 4              |               |             |
|          | Additional Common Course II                                                      | ACC            | 4       | 5              |               |             |
|          | Core Course 2<br>Business Environment                                            | CC             | 2       | 3              |               |             |
|          | Core Course 3<br>Entrepreneurship Development                                    | CC             | 4       | 4              |               |             |
|          | Complementary Elective Course 3<br>Quantitative Technique for Business Decisions | CEC            | 4       | 4              |               |             |

|       |                                                                                     |      |   |   |     |     |
|-------|-------------------------------------------------------------------------------------|------|---|---|-----|-----|
| III   | Skill Enhancement Course I<br>Numerical skills                                      | SEC  | 4 | 5 | 20  | 25  |
|       | Ability Enhancement Course I<br>Personality development and<br>communication skills | AEC  | 4 | 4 |     |     |
|       | Core Course 4<br>Financial Accounting                                               | CC   | 4 | 6 |     |     |
|       | Core Course 5<br>Marketing Management                                               | CC   | 4 | 5 |     |     |
|       | Complementary Elective Course 4<br>Legal Aspects Business                           | CEC  | 4 | 5 |     |     |
| IV    | Core Course 6<br>Human Resource Management                                          | CC   | 4 | 6 | 21  | 25  |
|       | Core Course 7<br>Financial Management                                               | CC   | 4 | 5 |     |     |
|       | Core Course 8<br>Operations management                                              | CC   | 4 | 5 |     |     |
|       | Core Course 9<br>Industrial Visit and Report                                        | DSEC | 1 | 0 |     |     |
|       | Skill Enhancement Course II<br>IT Tools for business                                | SEC  | 4 | 5 |     |     |
|       | Ability Enhancement Course II<br>Environmental studies                              | AEC  | 4 | 4 |     |     |
| V     | Core Course 10<br>Business Research Methods                                         | CC   | 4 | 5 | 18  | 25  |
|       | Core Course 11<br>Accounting for management                                         | CC   | 4 | 6 |     |     |
|       | Core Course 12<br>Elective I                                                        | DSE  | 4 | 6 |     |     |
|       | Core course 13<br>Elective II                                                       | DSE  | 4 | 6 |     |     |
|       | Generic Elective Course                                                             | GEC  | 2 | 2 |     |     |
| VI    | Core Course 14<br>Organisation Behaviour                                            | CC   | 4 | 6 | 18  | 25  |
|       | Core Course 15<br>Banking Theory and Practice                                       | CC   | 4 | 5 |     |     |
|       | Core Course 16<br>Project Report and viva voce                                      | CC   | 2 | 2 |     |     |
|       | Core Course 17<br>Elective III                                                      | DSE  | 4 | 6 |     |     |
|       | Core Course 18<br>Elective IV                                                       | DSE  | 4 | 6 |     |     |
| Total |                                                                                     |      |   |   | 120 | 150 |

**PART A:**  
**BBA CORE COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**( 2019 ADMISSION ONWARDS )**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                                        | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|------------------------------------------------------------|-----------------|-----------------------|---------------|-----------------|
| 1B01BBA            | Core Course I.<br>Principles And Practice Of Management    | I               | 3                     | 3             | 3               |
| 2B02BBA            | Core Course 2<br>Business Environment                      | II              | 3                     | 2             | 3               |
| 2B03BBA            | Core Course 3<br>Entrepreneurship Development              | II              | 4                     | 4             | 3               |
| 3B04BBA            | Core Course 4<br>Financial Accounting                      | III             | 6                     | 4             | 3               |
| 3B05BBA            | Core Course 5<br>Marketing Management                      | III             | 5                     | 4             | 3               |
| 4B06BBA            | Core Course 6<br>Human Resource Management                 | IV              | 6                     | 4             | 3               |
| 4B07BBA            | Core Course 7<br>Financial Management                      | IV              | 5                     | 4             | 3               |
| 4B08BBA            | Core Course 8<br>Operations Management                     | IV              | 5                     | 4             | 3               |
| 4B09BBA            | Core Course 9<br>Industrial Visit And Report               | IV              | 0                     | 1             | -               |
| 5B10BBA            | Core Course 10<br>Business Research Methods                | V               | 5                     | 4             | 3               |
| 5B11BBA            | Core Course 11<br>Accounting For Management                | V               | 6                     | 4             | 3               |
| 5B12BBA            | Core 12<br>Elective I                                      | V               | 6                     | 4             | 3               |
| 5B13BBA            | Core 13<br>Elective II                                     | V               | 6                     | 4             | 3               |
| 6B14 BBA           | Core Course 14<br>Organisation Behaviour                   | VI              | 6                     | 4             | 3               |
| 6B15BBA            | Core Course 15<br>Banking Theory and Practice              | VI              | 5                     | 4             | 3               |
| 6B16BBA            | Core Course 16<br>Project Report and Viva Voce Examination | VI              | 2                     | 2             | -               |
| 6B17BBA            | Core Course 17<br>Elective III                             | VI              | 6                     | 4             | 3               |
| 6B18BBA            | Core Course 18<br>Elective IV                              | VI              | 6                     | 4             | 3               |



**DISCIPLINE SPECIFIC ELECTIVE COURSES****I FINANCE**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>           | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|-------------------------------|-----------------|-----------------------|---------------|-----------------|
| 5B12BBA            | Advanced Financial Management | V               | 6                     | 4             | 3               |
| 5B13BBA            | Income tax law and Practice   | V               | 6                     | 4             | 3               |
| 6B17BBA            | Insurance and Risk management | VI              | 6                     | 4             | 3               |
| 6B18BBA            | Stock And Commodity Markets   | VI              | 6                     | 4             | 3               |

**II HUMAN RESOURCE MANAGEMENT**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                             | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|-------------------------------------------------|-----------------|-----------------------|---------------|-----------------|
| 5B12BBA            | Human Resource Development                      | V               | 6                     | 4             | 3               |
| 5B13BBA            | Performance and Compensation Management         | V               | 6                     | 4             | 3               |
| 6B17BBA            | Counselling and negotiation skills for managers | VI              | 6                     | 4             | 3               |
| 6B18BBA            | Organisational Change and Development           | VI              | 6                     | 4             | 3               |

**III MARKETING**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>              | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|----------------------------------|-----------------|-----------------------|---------------|-----------------|
| 5B12BBA            | Consumer Behaviour               | V               | 6                     | 4             | 3               |
| 5B13BBA            | Advertising and Brand Management | V               | 6                     | 4             | 3               |
| 6B17BBA            | Logistics Management             | VI              | 6                     | 4             | 3               |
| 6B18BBA            | Retail Management                | VI              | 6                     | 4             | 3               |

**PART B**  
**GENERAL AWARENESS COURSE**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                                                                 | <b>SEMESTER</b> | <b>HOURS PER WEEK</b>   | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|-------------------------------------------------------------------------------------|-----------------|-------------------------|---------------|-----------------|
| 3A11BBA            | Skill Enhancement Course I<br>Numerical Skills                                      | III             | 5                       | 4             | 3               |
| 3A12BBA            | Ability Enhancement Course I<br>Personality Development and<br>Communication Skills | III             | 4                       | 4             | 3               |
| 4A13BBA            | Skill Enhancement Course II<br>IT Tools For Business                                | IV              | Theory 3<br>Practical 2 | 4             | 2               |
| 4A14BBA            | Ability Enhancement Course II<br>Environmental Studies                              | IV              | 4                       | 4             | 3               |

**PART C**  
**COMPLEMENTARY ELECTIVE COURSE**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                               | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|---------------------------------------------------|-----------------|-----------------------|---------------|-----------------|
| 1C01BBA            | Statistics for business decisions                 | I               | 4                     | 4             | 3               |
| 1C02BBA            | Managerial Economics                              | I               | 4                     | 4             | 3               |
| 2C03BBA            | Quantitative Techniques For<br>Business Decisions | II              | 4                     | 4             | 3               |
| 3C04BBA            | Legal Aspects Of Business                         | III             | 5                     | 4             | 3               |

**GENERIC ELECTIVE COURSE**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>              | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|----------------------------------|-----------------|-----------------------|---------------|-----------------|
| 5D01BBA            | Customer Relationship Management | V               | 2                     | 2             | 2               |
| 5D02BBA            | Service Marketing                | V               | 2                     | 2             | 2               |
| 5D03BBA            | E- Commerce                      | V               | 2                     | 2             | 2               |
| 5D04BBA            | Event Management                 | V               | 2                     | 2             | 2               |
| 5D05BBA            | Disaster Management              | V               | 2                     | 2             | 2               |

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> |
|-------------------|------------------|
| EXTERNAL          | 4 (40 MARKS)     |
| INTERNAL          | 1(10 MARKS)      |

\*20 marks for theory and 20 marks for practical for courses having practical (IT in business)

**CONTINUOUS INTERNAL ASSESSMENT**

| <b>COMPONENT*</b>                      | <b>WEIGHTAGE**</b> | <b>REMARKS</b>                   |
|----------------------------------------|--------------------|----------------------------------|
| COMPONENT1<br>INTERNAL TEST            | 2                  | TWO TESTS<br>(6 MARKS)           |
| COMPONENT 2<br>ASSINGMENT/SEMINAR/VIVA | 1                  | INDIVIDUAL OR GROUP<br>(4 MARKS) |

**EVALUATION FOR GENERIC ELECTIVE**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> |
|-------------------|------------------|
| EXTERNAL          | 4 (20 MARKS)     |
| INTERNAL          | 1(5 MARKS)       |

**CORE COURSE I : PRINCIPLES AND PRACTICES OF MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>I</b>        | <b>1B01BBA</b>     | <b>3</b>              | <b>3</b>      | <b>3</b>        |

**COURSE OUTCOME**

CO 1: Acquaint with the basics of management.

CO2: Understand the process and functions of management.

CO3: Familiarize the students with the current management practices.

Co4: Develops administrative skills

**Module I: Management:** Definition, Nature, Purpose, Scope, Features, levels and functions- Evolution of Management Thoughts- classical, neo classical and modern, Contributions made by Taylor, Fayol , and Maslow.

**(20 Hrs)**

**Module II: Planning and organising:** Planning-Meaning, Nature, characteristics, types, steps in Planning - Decision making Process – types of Decisions. Organising - Meaning, Principles, Delegation of Authority- centralisation and decentralisation-meaning and differences

**(20 Hrs)**

**Module III: Staffing and directing:** Staffing- meaning, process. Directing – Meaning, Nature, Principles, Importance, Elements .Controlling- meaning, process-,control techniques- Need for co-ordination.

**(20 Hrs)**

**Module IV: Trends in Management -**

Work life balance-meaning, components (self management, time management, stress management).BPO – KPO – meaning, importance and differences

**(12 Hrs)**

**Books for Reference:**

1. Principles of Management LM Prasad, Himalaya
2. Harold Koontz & Heinz Weihrich, Essentials of Management, Tata McGraw Hill, New Delhi
3. P.C.Tripathy And P.N.Reddy, Principles of Management, Tata McGraw Hill, New Delhi
4. Richerd L Daft, Principles of Management, Cengage Learning, India Edition, New Delhi.
5. T.Ramasami, Principles of Management, Himalaya Publications, Mumbai.
6. S.P.Robbins, David A Decenzo and Mary Coulter, Fundamentals of Management, Pearson Education, New Delhi.

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 17    |
| II     | 17    |
| III    | 16    |
| IV     | 10    |
| Total  | 60    |

**SEMESTER I**  
**COMPLEMENTARY ELECTIVE COURSE I: STATISTICS FOR BUSINESS DECISIONS**

| SEMESTER | COURSE CODE    | HOURS PER WEEK | CREDIT   | EXAM HRS |
|----------|----------------|----------------|----------|----------|
| <b>I</b> | <b>1C01BBA</b> | <b>4</b>       | <b>4</b> | <b>3</b> |

**COURSE OUTCOMES**

**CO1:** Understand the importance and relevance of statistics, primary data, secondary data and the statistical technique as applicable to business

**CO2:** Classify, tabulate and represent the statistical data in appropriate manner using statistical methods

**CO3:** Analysis trend and seasonality in a time series data

**CO4:** Construct index numbers and enable to compare the price movements of commodities over different time periods.

**CO5:** Identify the correlation between variables

**CO6:** Problem solving and fit the regression line which enable to draw conclusion about data distribution.

**Module I**

Introduction -Meaning and Definition of Statistics-Functions-scope-uses-advantages and limitations-Collection of data-types of data - Primary data, Secondary data, Classification and tabulation of statistical Data- Diagrammatic and graphical representation of data

**(20 Hrs)**

**Module II**

Time series- Components- Methods of studying secular trend- Free hand curves-Semi Average Method- Moving Average Method-Method Least Squares

**(15 Hrs)**

**Module III**

Index Numbers- meaning and definition-uses-Problems in the construction of Index numbers- Types of Index numbers- Methods of construction of Index numbers- Tests- Fixed

base and chain base methods-Consumer price index: uses and methods of construction  
(17Hrs)

#### **Module IV**

Correlation and Regression Analysis-meaning- definition-Methods of correlation- Karlpearson's coefficient of correlation –Spearman's Rank correlation- concurrent Deviation method-probable error-Simple Regression Analysis-regression line-regression equations- algebraic methods and their applications in business. (20Hrs)

#### **References**

Statistical Methods- S.P.Gupta

Business Statistics- J.K Sharma

Business Statistics- P.R.Vital

Fundamentals of Mathematics and Statistics by V.K.Kapoor and S.C Gupta

#### **Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 17    |
| II     | 17    |
| III    | 16    |
| IV     | 10    |
| Total  | 60    |

**SEMESTER I**  
**COMPLEMENTARY ELECTIVE COURSE II: MANAGERIAL ECONOMICS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>I</b>        | <b>1C02BBA</b>     | <b>4</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOMES**

- CO1.** Understand basic managerial economic concepts  
**CO2.** Understands economics and related disciplines and relationships  
**CO3.** Apply economic analysis in the formulation of business policies  
**CO4.** Use economic reasoning to problems of business

**Module I**

**Introduction to Managerial Economics:** Concept, meaning, scope. Managerial economics and other disciplines. Basic economic concepts in decision making.

**(20 hours)**

**Module II**

**Demand Analysis:-** Law of demand, Determinants of demand, Price elasticity of demand, Income elasticity of demand, cross elasticity of demand, uses of elasticity for analyzing demand.

**(20 hours)**

**Module III**

**Cost Analysis:** Cost concepts and determinants of cost, cost output relationship in short and long period. **Supply:** Introduction to supply and supply curves.

**(20 hours)**

**Module IV**

**Pricing Analysis:** Price determination under perfect, imperfect competition and monopoly. Types of pricing methods

**(12 hours)**



**References:**

1. Managerial Economics: Analysis, Problems and Cases, P.L. Mehta.
2. Managerial Economics: Varshney and Maheshwari.
3. Managerial Economics: D. Salvatore.
4. Managerial Economics: Pearson and Lewis
5. Managerial Economics: G.S. Gupta

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 17    |
| II     | 17    |
| III    | 16    |
| IV     | 10    |
| Total  | 60    |

**II SEMESTER****CORE COURSE II : BUSINESS ENVIRONMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>II</b>       | <b>2B02BBA</b>     | <b>3</b>              | <b>2</b>      | <b>3</b>        |

**COURSE OUTCOMES**

**CO 1:** Acquire in-depth knowledge about different environment in business climate.

**CO2:** Understand the minor and major factors affecting the business in various streams

**CO3:** Familiarize the role of socio-cultural factors on development of economy and business.

**CO4:** Develop good business policies.

**Module I:** Business Environment – Concept of BE, Components of BE , Importance of BE , Environmental Analysis , Benefits and Limitations of Environmental Analysis.

**(8 Hrs)**

**Module II:** Social and Cultural Environment – Interface between Business and Culture – Social Responsibilities of business – Political Environment – Economic Role of Government – Legal Environment – Constitutional Environment.

**(14 Hrs)**

**Module III:** Economic environment – Nature of Economic Environment – New Economic Policy 1991 –Privatization – Nature of Privatization – Objectives of Privatization. Disinvestment – Limitations of disinvestment – Public sector – Objectives of Public Sector.

**(18 Hrs)**

**Module IV:** Ecological Environment – Ecology and Business – Industrial Pollution – Global Environment –Globalization - MNC s – Problem with MNCs – Global Entry Strategies – Measures to promote Globalization – Challenges of Globalization to Indian Industry.

**(14 Hrs)**

**Books for Reference:**

1. Business Environment: C.B.Gupta
2. Business Environment: Francis Cherunilam
3. Business Environment: Dr. P.K.Ghosh
4. Essentials of Business Environment

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 8     |
| II    | 16    |
| III   | 20    |
| IV    | 16    |
| Total | 60    |

**SEMESTER II****COMPLEMENTARY ELECTIVE COURSE III :QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>II</b>       | <b>2C03BBA</b>     | <b>4</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOME****CO1. Understands concepts of quantitative techniques****CO2. Develops analytical thinking and logical reasoning for effective decision making****CO3. Apply probability theories in real life situations****CO4. Understands theoretical distributions and hypothesis testing and its applications in live situations****Module I:**

Quantitative Techniques-Introduction-Meaning and definition-Application of Quantitative Techniques in business-Limitations **(12 hours)**

**Module II:**

Probability -Concept of Probability-Meaning and definition-Approaches to probability-Theorems of probability-Addition theorem-Multiplication theorem-Conditional probability-Inverse probability-Bayes' theorem. **(15 hours)**

**Module III:**

Theoretical Distribution - Binomial distribution - Basic assumptions and characteristics - Fitting of binomial distribution - Poisson distribution - characteristics - Fitting of Poisson distribution - Normal distribution - features and properties - Standard normal curve.

**(20 hours)****Module IV:**

Statistical Inference - Testing of hypothesis – Procedure –Null & Alternate hypothesis - Level of significance – Critical region- Degrees of freedom- Errors in testing- Two tail test and One tail test Parametric tests & Non parametric tests (only theory) **(25 hours)**

**REFERENCE**

1. S.P. Gupta, Statistical Methods, Sultan Chand & Co.
2. S.C. Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics, S. Chand & Co.
3. B.L. Agarwal, Basic Statistics, New Age International
4. Quantitative Techniques in Management : Vohra
5. R. K. Ghosh, S. Saha, Business Mathematics & Statistics, New Central Book Agency

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 10    |
| II     | 17    |
| III    | 20    |
| IV     | 13    |
| Total  | 60    |

**SEMESTER II**  
**CORE COURSE III : ENTREPRENEURSHIP DEVELOPMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>II</b>       | <b>2B03BBA</b>     | <b>4</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOME**

**CO 1:** Understand different stages of business and create innovative thinkers to take forward new initiatives.

**CO2:** Acquaint them with the challenges faced by the entrepreneur

**CO3:** Familiarize the students the entrepreneurship opportunities available in the society.

**CO4:** Develop the motivation to enhance entrepreneurial competency.

**Module I:** Introduction: The Entrepreneur: Definition, Emergence of Entrepreneurial Class; Theories of Entrepreneurship; Role of Social Economic Environment; Characteristics of Entrepreneur; Leadership; Risk Taking; Decision Making and Business Planning. **(18 Hrs)**

**Module II:** Concept of women entrepreneur -problems of women entrepreneur -Promotion of a Venture: Opportunities Analysis; External Environmental Analysis- Economic, Social and Technological; Competitive Factors; Legal Requirements of establishment of a new unit and Rising of Funds; Venture Capital. **(16 Hrs)**

**Module III:** Entrepreneurial Behaviour: Innovation and entrepreneur; Entrepreneurial Behaviour and psycho-theories, social responsibility. Entrepreneurial Development Programmes (EDP): EDP, its role, relevance and achievements; role of government in organizing EDP's critical evaluation **(20 Hrs)**

**Module IV:**

Role of entrepreneur: Role of an entrepreneur in economic growth as an innovator, generation of employment opportunities, complimenting and supplementing economic growth, bringing about social stability and balanced regional development of industries:

**(18 Hrs)**

**Books for Reference:**

1. Entrepreneurship. : Vasant Desai.
2. Entrepreneurship Development: Taneja& S.L. Gupta.
3. Venture Capital –The Indian Experience: Pandey, I.M.
4. Environment and Entrepreneur Tandon B.C
5. A practical guide to industrial entrepreneurs: Srivastava S.B.
6. Project Preparation, Appraisal, Implementation: Chandra, Prasana
7. Entrepreneurship New Venture Creation; Holt

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 15    |
| II     | 13    |
| III    | 17    |
| IV     | 15    |
| Total  | 60    |

### III SEMESTER

#### CORE COURSE IV : FINANCIAL ACCOUNTING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| III      | 3B04BBA     | 6              | 4      | 3        |

#### COURSE OUTCOMES

CO1: Understands accounting concepts and principles

CO2: Apply knowledge regarding concepts in the preparation of final accounts of sole traders

CO3: Understands the basic concepts of company, shares and share capital

CO4: Demonstrates skills in preparation of final accounts of companies

**Module I: Introduction To Accounting:** Meaning and Definition of Accounting, Objectives of Accounting, Accounting Cycle or Process, Branches of Accounting, Functions of Accounting, Users of Accounting, Limitations of Accounting and Generally Accepted Accounting Principles- Accounting Concepts, Principles and Conventions only. **(30 hours)**

**Module II: Final accounts of sole trading concern:** Preparation of Manufacturing, Trading and Profit and Loss Accounts and Balance Sheets with Adjustments for Outstanding and Prepaid Expenses, Accrued and Unearned incomes, Depreciation, Bad and Doubtful Debts and Closing Stock. **(30 hours)**

**Module III: Company accounts:** Meaning and Definition of Companies, Characteristics of Companies, Types of Companies, Meaning of Shares and Share Capital, Types of Shares, Accounting Entries for Issue of Shares for Cash, Forfeiture of Shares, and Re-issue of Shares. **(25 Hours)**

**Module IV: Final accounts of companies:** Preparation of Balance Sheet and Statement of Profit and Loss Accounts, Corporate Dividend Tax (CDT), Internal and External Reconstruction- Amalgamation, Merger and Acquisition (Theory Only).

**(33 Hours)**



**Reference**

Advanced accounting : SP Jain and KL Narang

Advanced Accounting :Shukla, Grewal

Advanced Accounting: SN Maheswary

Advanced Accounting: BS Raman

**Marks Including Choice**

| Module | Marks |
|--------|-------|
| I      | 15    |
| II     | 15    |
| III    | 15    |
| IV     | 15    |
| Total  | 60    |

### III SEMESTER

#### CORE COURSE V: MARKETING MANAGEMENT

| SEMESTER | COURSE CODE | HOURS | CREDIT | EXAM HOURS |
|----------|-------------|-------|--------|------------|
| III      | 3B05BBA     | 5     | 4      | 3          |

#### COURSE OUTCOME

**CO 1.** Develop knowledge on the concept modern marketing, marketing environment, marketing mix, market segmentation and target marketing.

**CO 2.** Enhance knowledge on product decision, product mix, product life cycle, pricing strategies and price discrimination

**CO 3.** Apply the concept of market promotion, market promotion mix and sales promotion techniques in real business situations.

**CO 4.** Understand the new market realities, direct marketing, online marketing and customer relationship marketing.

**CO 5.** Identify the key characteristics of customer relationship marketing and common draw back.

**CO 6.** Develop idea on branding and strategies of branding

**CO 7.** Acquire skill in preparing advertisement copy very effectively.

**Module I: Introduction to Modern Marketing:** Definition-Nature and Importance of marketing, evolution of marketing, Marketing environment; Macro and Micro environment, important marketing concepts-selling and marketing-Marketing mix, consumer behaviour, market segmentation; bases for market segmentation; Target Market ;Branding –definition, importance , branding strategies and packaging.

**(20 Hours)**

**Module II: Product Decision:** Concept of product; Product Dimension; Concept of product mix, Product line and Product Items; Product mix Dimensions; New product concept and reasons of failure of the new product; Product Life cycle- Concept of pricing; significance of price in marketing; Pricing objectives; Factors affecting price; discounts and rebates; pricing strategies; price discrimination.

**(20 Hours)**

**Module III: Market Promotion :** Concept of market promotion; Objectives of Market Promotion; Elements of Market Promotion mix: advertising, personal selling , sales promotion, publicity and public relations; Advertising : functions of advertising; advertisement copy, advertising media; types of advertising media; characteristics of effective media ; ethical aspects of advertising; Personal selling : Concept, Features and Significance; Difference between advertising and personal selling ; functions of a salesman; characteristics of a good salesman; Distribution decision: Physical distribution; channel of distribution; Types of channel distribution; Sales promotion: sales promotion schemes; sample; coupon; price off; premium plan; trade fairs and exhibitions. **(30 Hours)**

**Module IV: New Marketing Realities:** Direct marketing and online marketing: Concept of Direct and online Marketing; Activities; Benefits and limitations; Green Marketing: Concepts; Need and Importance; Green Marketing efforts and managerial Implications; Customer Relationship Marketing(CRM): Concept and importance; Components of CRM Programme; Concept of e-CRM; Common draw backs of CRM Programme.

**(20 Hours)**

**References:**

1. Philip Kotler, Marketing Management- Prentice Hall
2. Stanton, Etzel and Walker, Marketing Management-McGraw Hill
3. R. Saxena, Marketing Management- Tata McGraw Hill
4. Majumdar, Marketing Research
5. Marketing Management : RSN Pillai and Bagavathy
6. Marketing Management : SP Bansal

**Marks Including Choice**

| Module | Marks |
|--------|-------|
| I      | 13    |
| II     | 13    |
| III    | 20    |
| IV     | 14    |
| Total  | 60    |

### III SEMESTER

#### SKILL ENHANCEMENT COURSE I: NUMERICAL SKILLS

| SEMESTER | COURSE CODE | HOURS | CREDIT | EXAM HOURS |
|----------|-------------|-------|--------|------------|
| III      | 3A11BBA     | 5     | 4      | 3          |

#### COURSE OUTCOMES

**CO 1.** Understand common numerical methods

**CO 2.** Apply numerical methods to obtain approximate solutions to mathematical problems

**CO 3.** Analyses and evaluate the accuracy of common numerical methods

**CO 4.** Derive numerical methods for various mathematical operations and tasks

Module I: Arithmetic : Average, Mixtures – Ratios and proportions – Computations of interest – Simple interest – Compound interest – effective yield – Future value, present value – Amortization – depreciation – continuous compounding.

**(20 Hours)**

**Module II:** Algebra : Real and imaginary numbers – Rational and irrational numbers – Set theory- Union of sets- intersection of sets – Venn diagram – Elements of co – ordinate system, matrices –operational rules – Inverse of a matrix.

**(20 Hours)**

**Module III:** Theory of equations: Meaning, types of equations – simple linear and simultaneous equations (Only two variables) Eliminations and substitution method only. Quadratic equations factorization and formula method ( $ax^2+bx+c = 0$  form only) Problems on business application.

**(25 Hours)**

**Module IV:** Progression: Arithmetic Progressions, Finding the ‘n’ th term of an AP and also sum to n terms of AP. Insertion of arithmetic means in given terms of AP and representation of AP. Geometric Progression. Finding the ‘n’ th term of GP. Insertion of GMs in given GP and also representation of GP. Mathematics of finance simple and compound interest( Simple problems only)

**(25 Hours)**

References :

1. Applied Numerical analysis – P K Kandasamy, K Thilakavathi, Gunavathi
2. Numerical methods : Gerald
3. Essentials of college mathematics for Business, Economics, life science and social science : Raymond Barnett, Michael Ziegler.
4. Business Mathematics : Padmalochan Hazarika

**Marks Including Choice**

| Module | Marks |
|--------|-------|
| I      | 15    |
| II     | 15    |
| III    | 15    |
| IV     | 15    |
| Total  | 60    |

**ABILITY ENHANCEMENT COURSE I: PERSONALITY DEVELOPMENT AND COMMUNICATION SKILLS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>III</b>      | <b>3A12BBA</b>     | <b>4</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES**

**CO 1:** Understand the ‘self’ through analysis of one’s own strengths, weaknesses, opportunities and threats to face the challenging and competitive world.

**CO2:** Set new goals specific, measurable, achievable, realisable and time-bounded to reshape the personality and identify the shortcomings to be corrected.

**CO3:** Develop inter personal skills and problem solving skills.

**CO4:** Understand the role of body language in effective communication.

**CO5:** Critically evaluate the need for stress management and experience the essence of different techniques in reducing stress.

**CO6:** Perform effectively the assigned work to the fullest satisfaction; with utmost concentration and self motivation to achieve success in near future.

**Module I: Introduction to Personality Development:** Definition of Personality- Human Growth and Behaviour- Importance of Personality Development- Techniques in Personality development a) Self-confidence through SWOC b) Mnemonics c) SMART Goal setting d) Time Management and effective planning. **(15 Hrs)**

**Module II: Communication Skills:** a) Intra personal communication and types of Body Language b) Inter personal Communication and Relationships c) Leadership Skills d) Team Building and public speaking, Written communication- Basics of Letter writing, memorandum, notice, email, and report writing- Resume writing. **(20 Hrs)**

**Module III: Etiquettes and Manners:** Social etiquettes, phone etiquettes, Customer interaction etiquette, Dining- Business etiquettes- Professional etiquette tips- Boss Management.

**(12 Hrs)**

**Module IV: Presentation skills:** How to face an Interview? - Preparations before, during and after interview, DOs and Donts for interviewee- Group Discussions- problem solving, Creativity and Leadership skills.

**(10 Hrs)**

**Module V: Stress Management:**

Concentration and Relaxation exercises: Yoga, Meditation- Need for Work Life Balance- Role of Emotional Intelligence and Spiritual Intelligence in Self Acceptance and Self Growth.

(15 Hrs)

**References**

1. Personality Development and Communication Skills by S.S. Narula; reprinted 2013.
2. Communicating at Work – Principles and Practices for Business and the Professions by Adler, The McGraw Hill Company, 9th Edition
3. Business Communication and Personality Development by Biswajit Das & Ipseeta Satpathy, The Excel Publications, 1st Edition
4. Developing Soft Skills by Robert M. Sherfield, Rhonda J., Patricia J. Moodi; Cornerstone Publications.
5. “The Art of Stress-Free Living” by Sri Sri Ravi Shankar.
5. Winning at Interviews by Edger Thorpe, Showik Thorpe; Pearson Publications, 1st Edition.
6. “How to stop worrying and start living” by Dale Carnegie.
7. Complete Guide to Relieving Stress and Living A Peaceful Life - 2015 Edition by Jen Steifer.

**Marks Including Choice**

| Module | Marks |
|--------|-------|
| I      | 13    |
| II     | 16    |
| III    | 10    |
| IV     | 8     |
| V      | 13    |
| Total  | 60    |

**III SEMESTER****COMPLEMENTARY ELECTIVE COURSE 4: LEGAL ASPECTS OF BUSINESS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> |
|-----------------|--------------------|--------------|---------------|-------------------|
| <b>III</b>      | <b>3C04BBA</b>     | <b>5</b>     | <b>4</b>      | <b>3</b>          |

**COURSE OUTCOME**

**CO 1.** Understand the conditions and rules that are applicable to a contract and the importance of law in business.

**CO 2.** Identify the important and relevant documents needed for registering Indian companies.

**CO 3.** Awareness about the latest amendments in the Indian Companies Act

**CO 4.** Develop knowledge on the Sale of Goods Act, GST, the application of CGST, SGCT and its challenges and opportunities.

**CO 5.** Apply the knowledge on consumer protection Act, rights of consumer and dispute redressal agencies in real life situations.

**Module I :Indian Contract Act ,1872:** Law of contract, Definition of contract, Basic concepts of contract- Valid contract, Void ,voidable and illegal contract, offer, acceptance, consideration, capacity of parties to contract, free consent- coercion, undue influence, misrepresentation, fraud,- breach of contract – remedies of breach of contract. **(20 Hours)**

**Module II: Companies Act:** Definition of Company, essential features of company, Types of companies - Private Limited Company and Public limited company- Companies Act 2013 (Amendments), Important documents: Memorandum and Articles of Association, Prospectus- Promotion and Incorporation of company- Steps in the formation of company-Share capital of company- Shares, Debentures and its classification.

**(25 Hours)**

**Module III: The Sale of Goods Act:** Sale of goods Act- Formation of sale of contract- sale and agreement to sell-Implied conditions and warranties-Sale by non owners-transfer of property title of goods- Rights of unpaid seller-Remedies for breach of Contract of Sale of goods- Goods and service Tax- Basic concepts- Challenges and opportunities-Applicability of CGST and SGST.

**(25 Hours)**

**Module IV: Consumer Protection Act:** Objectives of the Act-Rights of a Consumer- Consumer Protection Council- Central council and State council-Dispute Redressal Agencies –



District forum, State Commission and National Commission-Filing of complaints- Procedure of Filing Complaint.

**(20 Hours)**

### **References**

1. Kapoor. N.D, Business Law, Sulthan Chand Publication
2. Tulsian. P.C, Business Laws, Tata McGraw-Hill Publishing Co. Ltd
3. Kuchal. M.C, Business Law
4. Sharma. S.C, Business Laws, International Publishers, Bengaluru

### **Marks Including Choice**

| Module | Marks |
|--------|-------|
| I      | 16    |
| II     | 16    |
| III    | 15    |
| IV     | 13    |
| Total  | 60    |

## IV SEMESTER

### CORE COURSE VI : HUMAN RESOURCE MANAGEMENT

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| IV       | 4B06BBA     | 6                 | 4      | 3           |

### COURSE OUTCOME

**CO1:** understand basic concept and principles of Human Resource Management.

**CO2:** sensitize to the training process and methods.

**CO3:** equip with the importance of the performance management system in enhancing employee performance.

**CO4:** equip with the importance of the performance management system in enhancing employee performance.

**Module I: Human resource management**-introduction-meaning- evolution of Human Resource management-objectives of HRM-importance of HRM-functions and process of HRM-HR Manager-Duties and responsibilities. **(15 Hours)**

**Module II : Acquiring Human Resources** – HR planning –meaning-importance of HR planning-benefits of HR planning-HR planning process-job analysis-meaning-process of job analysis-methods-Job description-contents of job description-job specification- contents of job specification-methods of job analysis-job evaluation –meaning-methods-benefits- job enlargement-job enrichment- **Recruitment**-meaning and definition-sources of recruitment-**selection**-meaning-steps in selection process-difference between recruitment and selection-placement-induction and orientation. **(25 Hours)**

**Module III: Developing Human Resources**- Training and Development- training- meaning-need for training- training process-benefits of training-methods of training-types of training-importance of training in HRD-Executive development. **(16 Hours)**

**Module IV: Rewarding Human Resources**- performance Appraisal-meaning-definition-objectives-methods of performance appraisal-uses and limitations-compensation management-objectives-wage system-time rate –piece rate-incentives-factors influencing wage system-promotion- types-bases of promotion-benefits-transfer-types-demotion-reasons.

**(18 Hours)**

**Module V: Human Resource Problems-** Employee Discipline-meaning –importance- Absenteeism-causes-measures to control absenteeism- labour turnover-lay off- grievance redressal-grievance –meaning-causes of grievance-importance of grievance redressal-procedure of grievance handling. **(16 Hours)**

### **Skill Development Programmes**

- Prepare chart showing the function of HRM and a brief explanation on the need for each function
- Prepare an advertisement for recruitment and selection of candidate for any organisation of your choice
- Develop a format for performance appraisal of an employee.
- Choose any MNC and present your observation on training programme.

**(18 Hrs)**

### **References:**

Human Resource Management-text and cases-VSP Rao  
 Human Resource Management-Aswathappa  
 Human Resource Management-L.M.Prasad  
 Human Resource Management-T.N.Chabbra  
 Personnel Management-Edwin.B.Flippo.McGraw Hill  
 Personnel Management-C.B.Mamoria

### **Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 10    |
| II     | 17    |
| III    | 11    |
| IV     | 12    |
| V      | 10    |
| Total  | 60    |

## IV SEMESTER

### CORE COURSE VII : FINANCIAL MANAGEMENT

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| IV       | 4BO7BBA     | 5                 | 4      | 3           |

#### COURSE OUTCOMES

**CO 1.** Understand the concept and objective of financial management

**CO 2.** Develop the ability to select the feasible and viable investment proposal

**CO 3.** Apply decision making tools in organisational context

**CO 4.** Ability to assess the risk and return of investment projects

**Module I:** Financial Management: Meaning, scope and objectives, Goals of financial management – Profit maximization – wealth maximization **(10 Hours)**

**Module II:** Cost of capital Meaning and significance – Computation of cost of Debt – cost of preference capital – Cost of equity – Weighted average cost of capital. Capital structure – Meaning and definition – Factors affecting capital structure – Optimal capital structure – over capitalization – under capitalization – EBIT – EPS analysis. **(25 Hours)**

**Module III:** Working capital Management Meaning and definition – concepts of working capital – Factors affecting working capital – types of working capital- Financing of working capital – operating cycle concept of estimating working capital (Practical problems and theory) **(25Hours)**

**Module IV:** Capital budgeting: Meaning, definition – importance – techniques of capital budgeting – payback period – average rate of return – Net present value method – profitability methods – IRR – Merits and demerits of Non discounting and discounting techniques. **(30 Hours)**

**References:**

1. Financial management : M Y Khan and P.K Jain
2. Financial management: I MPandey
3. Financial management :R K Sharma &Shashi K Gupta
4. Financial management : Prasanna Chandra
5. Financial management :Geoffrey Knott

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 5     |
| II     | 15    |
| III    | 20    |
| IV     | 20    |
| Total  | 60    |

## IV SEMESTER

### CORE COURSE VIII : OPERATIONS MANAGEMENT

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| IV       | 4B08BBA     | 5              | 4      | 3        |

#### **COURSE OUTCOME**

**CO 1:** Understand the transformation system.

**CO2:** Identify the components involved in designing effective operations system.

**CO3:** Understand the meaning and importance of managing quality.

**CO4:** Understand the meaning and importance of productivity and ways to improve productivity.

**CO5:** Understand the decisions and process of operations management in business firms.

**Module I:** Introduction to Production Management : meaning- functions - Scope . Plant location - factors affecting location selection. Plant layout - principles-types of layout. **(20 Hours)**

**Module II:** Production system : Different production systems. Production Planning and control - importance - elements - PPC in different production systems. **(20Hrs)**

**Module III:** Materials management - Importance - Principles. Material handling: equipments used. Maintenance Management - Types of maintenance - Methods study-Time study - Motion study - principles – work measurement. **(20 Hrs)**

**Module IV:** Inventory management - Importance - Tools - ABC, VED, FSN Analysis - EOQ – Reorder point - Safety Stock - Lead time. **(15 Hrs)**

**Module V:** Quality Management: Quality improvement techniques - quality control techniques. Advanced manufacturing technologies - TOC, Lean / Green manufacturing, WCM. **(15 Hrs)**

#### **Books for Reference:**

- 1) Production management : Aswathappa K
- 2) Russell, Roberta S, and Bernard W. Taylor III, Operations Management, Pearson Education, New Delhi.
- 3) Operations Management for Competitive Advantage, Tata McGraw Hill, New Delhi.
- 4) Buffa, E.S., 'Modern Production Management', New York, John Wiley

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 14    |
| II     | 13    |
| III    | 13    |
| IV     | 10    |
| V      | 10    |
| Total  | 60    |

**IV SEMESTER****SKILL ENHANCEMENT COURSE II: IT TOOLS FOR BUSINESS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDITS</b> | <b>EXAM<br/>HOURS</b> |
|-----------------|--------------------|---------------------------|----------------|-----------------------|
| <b>IV</b>       | <b>4A13BBA</b>     | <b>5(3+2)</b>             | <b>4</b>       | <b>2</b>              |

**COURSE OUTCOMES**

**CO 1:** Understand the working on word, PowerPoint, Excel etc.

**CO2:** Develop basic computer awareness for letter drafting, Slide making, Payroll preparation

**CO3:** Understand the various shortcuts for faster functioning on the computer system

**Module I:** Computer: History, classifications. Hardware – Input, Output, Storage Devices, Software – System software, Application software. Memory- Types of memory

**(10Hrs)**

**Module II:** Network of Computers- LAN, WAN, MAN, PAN. Network topologies, Internet, M-Commerce, WiFi

**(10Hrs)**

**Module III:** Application of IT: Application in education, Health care, Business,

**(6Hrs)**

**Module IV:** Cyber ethics: Meaning, **Cyber crimes:-** Computer virus, WORMS, Malware, Trojan Horse, Cyber forgery, Hacking, Fishing, Salami attack ,Email bombing (Concept only)

**(14Hrs)**

**Module V:MS WORD:** MS word window components, New file, open file, Save. Save as, Editing text, adding word art, Alignment, setting paragraph, header and footer, Insert page number, Arranging text in Columns, Creating a table, modifying a table, Formatting a table.

**(20 Hours)**

**MS Excel:** Creating worksheet with excel, spreadsheet, uses of spreadsheet, Editing cell contents, creating a simple formula, Creating a chart, Editing chart, Payroll preparation

**(20 Hours)**



**MS Power point:** Creating a New presentation, Choosing a Templates, Creating slides, and slide

**(10 Hours)**

**References:**

Computer Application in business: Dr R parameswaran

IT in action: Pearson

E Commerce: Gary P Schneider

Management Information System-managing the digital firm, Pearson Education: Kenneth C  
laudon and Jane P laudon

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 5     |
| II     | 5     |
| III    | 5     |
| IV     | 7     |
| V      | 8     |
| Total  | 30    |

## IV SEMESTER

### ABILITY ENHANCEMENT II: ENVIRONMENTAL STUDIES

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| IV       | 4A14BBA     | 4                 | 4      | 3           |

#### Course Outcomes

**CO1.** Acquire knowledge about environment and enable to contribute towards maintaining and improving the quality of the environment.

**CO2.** Understand the importance of protecting the environment and effect of environmental hazards

**CO3.** Analysis the ecosystem and the bio diversity nature of our country

**CO4.** Apply the awareness to point our Hot -spot of bio diversity in India and its conservation

**CO5.** Identify the effect of environmental Degradation and the role of Government in protecting the environment

**CO6.** Formulate some action plan to engage in activities for preventing environmental degradation.

**Module I:** Environmental studies- Meaning- definition-scope-Importance-Need-Components of environment: Lithosphere, Hydrosphere, Atmosphere and biosphere-need for public awareness-Natural resources: Forest resources. Water resources, Mineral resources, Energy Resources-Land resources-Role of individual in the conservation of natural resources-Equitable use of natural resources for sustainable life styles.

**(18 Hours)**

**Module II:** Eco-system- concept-Structure-Producers- Consumers- Decomposers-Energy flow in the eco-system-Bio-Diversity and its conservation: Introduction-Definition of genetic species and eco-system diversity- Value of Bio- diversity-Consumptive use- productive use- social , ethical and aesthetic value- Hot –spot of Bio-diversity- Threats to bio diversity- endangered and endemic species of India-Conservation of bio diversity: In -situ and Ex-situ conservation.

**(18 Hours)**

**Module III:** Environmental Degradation-Meaning-Types of pollutions- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution- control of Urban and

Industrial waste-Environmental Ethics-Issues and possible solutions-Climate change- Global warming-acid rain- Ozone layer Depletion- solid waste management

( 18 Hours)

**Module IV:** Environmental Protection -National environment Policy- Environmental legislations-International conventions and agreements –GATT / WTO and environment-Role of central government -Pollution control Board and its role in environment protection- Environmental Impact Assessment (EIA)- Eco-friendly products- Environment Audit- Role of NGO in environment protection.- Environmental movements-Chipko Movement-Apico Movement-Silent Valley-Environmental communication and Public awareness.

(18 Hours)

### References

1. Environment Management- G.N.Pandey, Vikas Publishing House
2. Text Book of Environment- K.M.Agrawal, MacMillan
3. Ecology and Economics-Ram Prasad Sengupta- Oxford
4. The Biodiversity of India-BharuchaErach, Mapin Publishing Ltd, Ahmadabad
5. UGC

### Marks Including Choice

| Module | Marks |
|--------|-------|
| I      | 15    |
| II     | 15    |
| III    | 15    |
| IV     | 15    |
| Total  | 60    |

**SEMESTER IV****CORE COURSE IX : INDUSTRIAL VISIT AND REPORT**

| <b>SEMESTER</b> | <b>COURSE<br/>CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|------------------------|---------------------------|---------------|---------------------|
| <b>IV</b>       | <b>4B09BBA</b>         | <b>NIL</b>                | <b>1</b>      | <b>-</b>            |

Every student shall prepare and submit a report based on industrial visit during the IV<sup>th</sup> semester under the guidance of a faculty member 1 month before the end of the semester. Evaluation shall be done internally. The maximum marks for the course shall be 25.

**COURSE OUTCOMES**

**CO 1:** acquire hands on experience of how industry operations are executed

**CO2:** analyses real life environment of business

**CO3:** enhance interpersonal skills and communication techniques.

**CO4:** acquire practical knowledge of industry practices and regulations

| <b>Internal Evaluation</b> |              |
|----------------------------|--------------|
| <b>25 marks</b>            |              |
| <b>Components</b>          | <b>Marks</b> |
| Punctuality                | 2            |
| Organisation of report     | 18           |
| Viva voce                  | 5            |
| <b>Total</b>               | <b>25</b>    |

**V SEMESTER****CORE COURSE X: BUSINESS RESEARCH METHODS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>V</b>        | <b>5B10BBA</b>     | <b>5</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOMES**

- CO 1.** Acquire basic concepts of research and its types
- CO 2.** Gain insight and acquire the ability to apply different research designs
- CO 3.** Acquire skill of data processing in terms of tabulation and classification.
- CO4.** Generate the ability to write research reports based on approved formats.

**Module I: Introduction to research-** Definition – Features –Scope of Research – Types of Research: Basic, Applied, Exploratory, Descriptive ,Experimental Research , Quantitative and Qualitative-Research Process - Steps in Research **(15Hrs)**

**Module II: Research problem** - Sources of research problem- Data collection- Primary and Secondary Data, Tools and techniques for collection of Data: Observational and Survey Methods – Questionnaire – Schedule, Difference between Questionnaire and schedule. **(25 Hrs)**

**Module III: Research design**–Meaning, Importance-Sampling Design: Selection of Appropriate Statistical Techniques : Probability: Cluster, Stratified, Systematic, Quota, Non probability: Judgemental, Convenience, snowball -Attitude measurement techniques . **(30 Hrs)**

**Module IV**

**Report writing-** Types of Reports, Contents, stages of Report writing- Footnote-Bibliography **( 20Hrs )**

## References

1. O.R.Krishnaswamy; Research methodology in Social Sciences, HPH, 2008.
2. R. Divivedi: Research Methods in Behavior Science, Macmillan India Ltd., 2001.
3. J.K. Sachdeva: Business Research Methodology HPH
4. S.N. Murthy, V. Bhojanna: Business Research Methods Excel Books
5. Levin & Rubin: Statistics for Management, Prentice Hall of India, 2002
6. Gupta S; Research Methodology and Statistical Techniques, Deep & Deep Publication (P) Ltd., 2002
7. Thakur D: Research Methodology in Social Sciences, Deep & Deep Publications (P) Ltd., 1998.
8. Tripathi P.C: A Textbook of Research Methodology, Sultan Chand & Sons, 2002.
9. Cooper: Business Research Methods 6th edition, MC Graw Hill,
10. C.R. Kothari, Research Methodology, Vikas Publications
11. Usha Devi N, Santhosh Kumar - Business Research Methodology

## Marks Including Choice

| Unit  | Marks |
|-------|-------|
| I     | 15    |
| II    | 20    |
| III   | 15    |
| IV    | 10    |
| Total | 60    |

**V SEMESTER****CORE COURSE XI : ACCOUNTING FOR MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE<br/>CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|------------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B11BBA</b>         | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES**

**CO 1.** Understand the concepts of cost and management accounting

**CO 2.** Prepare cost sheet and budgets of an organisation

**CO 3.** Analyse financial statements of corporate organisations using accounting ratios

**CO4.** Apply the concepts of marginal costing and standard costing in decision making

**Module I:** Management Accounting –Meaning, Definition, Nature, Scope, Difference between financial accounting, cost accounting and management accounting-Limitations of financial accounting- Recent trends in management reporting

**(15 hours)**

**Module II:** Cost Accounting- Concepts, objectives, scope, Uses- Elements of cost- cost classification-cost centre, cost unit- preparation of cost sheet.

**(15 hours)**

**Module III:** Analysis and Interpretation of financial statements- Meaning, types, Methods (Brief discussion only)- Ratio Analysis: Meaning and nature, Uses, Limitations- Types of ratios: Liquidity-solvency- Turnover- Profitability-Market test ratios- Judgement of financial stability through ratios (stress should be given to problem solving and interpretation skills) **(30 hours)**

**Module IV:** Marginal costing: concept-definition-features- CVP Analysis: Meaning, importance, Limitations, Uses of P/V ratio- Margin of safety—Breakeven chart- Application of CVP analysis(Theory only)

**(24 hours)**

**Module V:** Cost control Techniques: Budgetary control: concepts, objectives,- steps in budgetary control- Preparation of Budgets- (Cash budget and flexible budget only)- Standard costing: concept, uses, steps- Difference between budgetary control and standard costing- Variance analysis: (Material and labour

**(24 hours)**

**References**

Management Accounting: Sharma RK and Sasi K guptha

Management Accounting: RSN Pillai and Bagvathi

Cost Accounting : SP Jain and KL Narang

Cost Accounting :Dr D Agarwal

**Marks Including Choice**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 10    |
| III   | 15    |
| IV    | 15    |
| V     | 10    |
| Total | 60    |



**VI SEMESTER****CORE COURSE XIV: ORGANISATION BEHAVIOUR**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>VI</b>       | <b>6B14 BBA</b>    | <b>6</b>              | <b>4</b>      | <b>3</b>        |

**CO1.** Understand concepts, theories and techniques in the field of human behavior at individual, group and organization level.

**CO 2.** Understand personality determinants within personal and organizational context.

**CO3.** Understand concepts of learning and motivation and its context in organizational setting.

**CO4.** Identify the role and relevance of group dynamics in organizational management.

**Module I:** Organisational Behaviour - Definition, meaning and nature, scope and application in management, Contribution of other disciplines to OB, Emerging issues in OB - Attitude, Meaning, Characteristics, and Components of Attitude, Attitude formation, change in attitude and barriers to attitude.,- Leadership, leadership styles. **(18 hours)**

**Module II:** Personality- Determinants of personality, Factors- Personality theories- Trait theories, Type theories, psycho analytic theories and humanistic theories. **(25 hours)**

**Module III:** Perception- factors affecting perception,-Learning, theories of learning- classical, operant, and social theories- Motivation, role and importance, Theories of motivation- Herzberg, McGregor, Maslow, Bandura **(25 hours)**

**Module IV :** Group behavior- Group dynamics, features and types of group, stages of group development, group norms, group cohesion- Group conflict, types of conflict, conflict resolution **(20 hours)**

**Module V :** Organisational change and development- Nature of work change, Types of change, Factors influencing change, overcoming resistance to change - Organisational development- meaning, benefits and steps in OD **(20hours)**

**References:**

1. K. Aswathappa, Organizational Behaviour, HPH.
2. Appanniah&, Management and Behavioural Process, HPH.
3. Rekha&Vibha – Organizational Behavioural, VBH. 20
4. Robbins, Organizational Behaviour, International Book House.
5. John W. Newstrom&Kieth Davis, Organizational Behaviour, McGraw Hill.
6. P.G. Aquinas Organizational Behavior, Excel Books.
7. Fred Luthans, Organizational Behaviour. McGraw Hill.
8. M. Gangadhar. V.S.P.Rao and P.S.Narayan, Organizational Behaviour
9. M.N.Mishra: OrganisationalBehaviour and Corporate Development, HPH.
10. Karamapl : Business Management & Organizational Behavioral I.K. International
11. N.S. Gupta, Organizational Behaviour, HPH.
12. Jit. S. Chandan, OrganisationalBehaviour, Vikas Publishing House.
13. Sharma R.K & Gupta S.K, Management and Behaviour Process, Kalyani Publishers.
14. K. Venkataramana, OrganisationalBehaviour, SHBP.

**Marks Including Choice**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 10    |
| III   | 15    |
| IV    | 15    |
| V     | 10    |
| Total | 60    |

## VI SEMESTER

## CORE COURSE XV: BANKING THEORY AND PRACTICE

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| VI       | 6B15 BBA    | 5              | 4      | 3        |

## COURSE OUTCOMES

- CO1. Acquire knowledge about basics of banking
- CO2. Understands the law and practices of banking
- CO3. Understands the various banking terminologies
- CO4. Acquire knowledge of modern banking practices

**Module I:** Introduction to banking: origin and development of banking- structure of banking in India- Commercial banks- Functions-central bank-RBI: functions, fiscal and monetary policy- Banking Regulation Act 1949, Loans and advances: fixed advance, cash credit, overdraft, letter of credit, bill discounted- principles of sound lending.

**(20 Hours)**

**Module II:** Banker and customer relationship: Banker and customer-meaning- General and special relationship- Types of customers and account holders- minors, joint account holders, partnership firms, joint stock company with limited liability, executors, trustees, clubs and associations, joint hindu family- Procedure for opening and closing of accounts.

**(25 Hours)**

**Module III:** Negotiable instruments: Introduction-meaning and definition, features, kinds of negotiable instruments(meaning only)- cheques: meaning, definition, features- parties – crossing of cheques- types of crossing- Endorsement: meaning, essentials, kinds of endorsement, Dishonour of cheque, reason for dishonour.

**(25 Hours)**

**Module IV:** Technology in banking : need and importance- virtual banking- ATM- credit card- Debit card- Telebanking,m-banking, internet banking- RTGS(Real time Gross settlement), NEFT, Electronic Fund Transfer(EFT), SWIFT ( society for worldwide interbank financial telecommunication)- concept of core banking- Universal banking and Green banking(concept only)

**( 20 Hours)**

### Skill Development Activities

- collect and fill account opening form of SB and current A/c
- collect and fill pay-in-slip of SB and current A/c
- Draw different types of endorsement of cheques
- List customer services offered by at least two banks of your choice

### References

1. Banking Theory law and practice: Gorden and Natarajan, Himalaya Pub.
2. Banking law and practice : Maheswari.S.N., Kalyanipublishers
3. Banking Theory law and practice: Shekhar.K.C, Vikas publishing House
4. Modern banking: K.P.M. Sundharam and E.N.Sundharam, Sulthanchandans sons

### Marks Including Choice

| Unit  | Marks |
|-------|-------|
| I     | 15    |
| II    | 15    |
| III   | 15    |
| IV    | 15    |
| Total | 60    |

**I SEMESTER****CORE COURSE XVI:PROJECT REPORT AND VIVA VOCE**

| <b>SEMESTER</b> | <b>COURSE<br/>CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|------------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B16 BBA</b>        | <b>2</b>                  | <b>2</b>      | <b>-</b>            |

**COURSE OUTCOMES**

**CO1:** Analyses real life situations

**CO2:** Acquires group dynamic skills by group involvement

**CO3:** Develops solutions or inferences on the problem of study

**CO4:**Synthesis facts in the form of report

During the sixth semester the candidate shall do a research project on a relevant business/management/banking/commerce topic. This research project is envisaged as a practical application of the research methodology course studied in the BBA Programme. Therefore, it is essential that primary data is collected as part of the research at least to some extent. Maximum four students as a group can take up a topic and the students in consultation and with the consent of the assigned guide may identify a topic and do research on that topic. To have more academic freedom and flexibility, the project shall be done without being attached to any business organization. The candidates together shall prepare and submit a project report to the Department. The project report should be submitted to the Head of the Department on the last working day of the sixth semester. The candidates together as a group shall prepare a copy of the report and submit them in the department, which shall be handed over to the external examiner at the time of viva-voce examination. Each student in the group should also keep a personal copy with them . The report shall be prepared as per American Psychological Association (APA) or Modern Language Association (MLA) format. Use of Statistical software Students shall be encouraged to use statistical software for data analysis.

**Sample size**

Since the project is a group exercise, at least 100 samples should be selected for the study

**Structure of the Project report**

1. Title page
2. Declaration by the student
3. Bonafide Certificate from guide countersigned by HOD
4. Acknowledgement
5. Table of Contents
6. List of Tables
7. List of figures
8. List of Symbols, Abbreviations
9. Chapter I: Introduction (Background information, Statement of the Research problem, objectives of the study, Research methodology etc.)
10. Chapter II: Review of literature
11. Chapter III: Theoretical framework
12. Chapter IV: Data Analysis and Interpretation
13. Chapter V: Summary of findings and implications and Recommendations
14. Bibliography (books, journal articles etc. used for the project work).
15. Appendix (Questionnaire, specimen copies of forms, other exhibits etc.)

**Page size and typing instructions**

The project report shall be prepared in A4 sized bond paper. The report shall be printed and spiral bound/hard bound with not less than 60 pages. The general text of the report shall be typed with 1.5 line spacing. The general text shall be typed in the font 'Times New Roman' with font size 12. Paragraphs shall be arranged in justified alignment with margins 1.25" each on top, bottom, left and right of the page with portrait orientation. No boarder line should be given to the pages.

**Evaluation of project report**

The project report shall be subject to internal and external evaluation: Maximum 10 marks shall be awarded by the supervising teacher as the internal mark. Maximum 40 marks shall

be awarded by external examiners. Out of the external 40 marks, 20 marks shall be given for the report and 20 marks shall be given for the performance in viva voce examination as specified below. All the group members shall be given equal marks for their report and the viva-voce marks may vary based on the performance of each student in viva voce examination. Internal Evaluation (10 marks or 20% of total marks ) and External Evaluation ( 40 marks or 80% of total marks).

| <b>Internal Evaluation</b> |              |
|----------------------------|--------------|
| <b>10 marks</b>            |              |
| <b>Components</b>          | <b>Marks</b> |
| Punctuality                | 2            |
| Organisation of report     | 4            |
| Viva voce                  | 4            |
| <b>Total</b>               | <b>10</b>    |

| <b>External Evaluation</b> |                                                                       |              |
|----------------------------|-----------------------------------------------------------------------|--------------|
| <b>40 marks</b>            |                                                                       |              |
| <b>Components</b>          | <b>Sub components</b>                                                 | <b>Marks</b> |
| 1. Project report          | Relevance of the topic, statement of objectives                       | 5            |
|                            | Methodology, Research design                                          | 5            |
|                            | Use of statistical tools, Analysis and interpretation, major findings | 5            |
|                            | Recommendations, references/bibliography                              | 5            |
|                            | <b>Total</b>                                                          | <b>20</b>    |
| 2.Viva voce                | Viva voce                                                             | <b>20</b>    |
|                            | <b>Total</b>                                                          | <b>40</b>    |

**PART B****DISCIPLINE SPECIFIC ELECTIVE COURSE I****FINANCE****CORE COURSE XII (DSEC):-ADVANCED FINANCIAL MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B12BBA</b>     | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES**

**CO1:** To familiarize the students with advanced financial analysis and Decisions.

**CO2:** To equip the students with knowledge about the financing, dividend and liquidity areas of financial decision making in business organisation.

**CO3:** Demonstrate the importance of working capital management and the tools to manage it.

**CO4:** Provide the learners with the skills to evaluate complex investment situations.

**Module I: Financial Management-** meaning-nature - scope-traditional vs. modern concept-goal of financial management-profit vs. wealth maximization-finance function-role of finance manager-financial planning-meaning- steps in financial planning.

**(25 Hours)**

**Module II: Leverages and Capital Structure** –part 1.Leverages-meaning-types-operating leverage-financial leverage-combined leverage (problems) part 2.capital structure-meaning-factors affecting capital structure-theories of capital structure- Net Income Approach-Net Operating Income Approach- Traditional theory-MM theory

**(30 Hours)**

**Module III: Planning and forecasting of working capital** –concept of working capital-determinants of working capital-estimating working capital needs-methods-operating cycle method-net current asset forecast method-cash management-motives of holding cash-cash management techniques-preparation of cash budget-receivables management-preparation of Ageing schedule-and debtors turnover ratio—inventory management techniques-problems on EOQ .

**(35 Hours)**



**Module IV: Dividend theories**-introduction-meaning of dividend-forms of dividend-irrelevance theory-MM model-Relevance theory-Walters model-Gordon's model-problems on dividend theories. **(18 Hours)**

**References:**

1. I.M.Pandey Financial management: Vikas publishing house, New Delhi
2. Prasanna Chandra Financial management: Tata McGraw Hills, New Delhi
3. M.Y.Khan & P.K.Jain Financial management: Tata McGraw Hills, New Delhi
4. Brealy and Steward Corporate finance: McGraw Hills, New York
5. Bhattacharya working capital management, strategies and techniques prentice Hall ,Delhi
6. R.K.sharma & S.K.Guptha Financial management
7. V.K.Bhalla Financial management
8. S.C.Kuchal Financial management

**Marks including choice:**

| <b>Module</b> | <b>Marks</b> |
|---------------|--------------|
| I             | 14           |
| II            | 17           |
| III           | 19           |
| IV            | 10           |
| Total         | 60           |

**CORE COURSE XIII (DSEC): INCOME TAX LAW AND PRACTICE**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B13BBA</b>     | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES:**

**CO1:** understand the basic concepts and definitions under the Income Tax Act,1961.

**CO2:** Acquire knowledge about Computation of Income under different heads of Income of Income Tax Act,1961.

**CO3:** Acquire Knowledge about the submission of Income Tax Return, Advance Tax, Tax deducted at Source, Tax Collection Authorities.

**CO4:** Acquire Competency in taking up employment in Tax planning and management.

**Module 1: Income Tax Act-1961. (Meaning ,Concepts and Definitions):**Income, Person, Assessee, Assessment year, Previous year, Agricultural Income, Exempted Income, Residential Status of an Assessee, Capital and Revenue Income and expenditure. **(20 Hrs.)**

**Module II : Computation of Taxable Income under the different heads of Income.:**

**a) Income from Salary:** Salient features, meaning of salary, Allowances and tax Liability-Perquisites and their Valuation- Deductions from salary.(Theory and Problems)

**b) Income from House Property:** Basis of Chargeability-Annual Value-Self occupied and let out property- Deductions allowed (Theory and Problems)

**c) Profits and Gains of business or profession:** Definitions-business, profession, , computation of profits and gains- deductions and deductions disallowed (Theory and Problems)

**d) Capital Gains:** Chargeability-definitions- Short term and long term capital gains-deductions, exemptions (simple problems only)

**e) Income from other sources:** Chargeability-deductions-Amounts not deductible. (simple problems only) **(50 Hrs.)**

**Module III: Computation of Total Taxable Income of an Individual:**

Aggregation of income, clubbing, setoff and carry forward, deductions from GTI, computation of total income and tax liability of individual **(38 Hrs.)**

**Books for References:**

1. Income Tax law and Accounts: Dr HC Mehrotra and Dr SP Goyal
2. Direct taxes Law and Practice: Vinod K Singhaniya
3. A P Philip: Direct Taxes Law & Practice
4. Income tax Law and Practice :Dr.Bhagavathi Prasad
5. Income tax Law and Practice : Gaur and Narang

**Marks including choice:**

| <b>Module</b> | <b>Marks</b> |
|---------------|--------------|
| I             | 15           |
| II            | 30           |
| III           | 15           |
| <b>Total</b>  | <b>60</b>    |

**CORE COURSE XVII (DSEC): INSURANCE AND RISK MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B17BBA</b>     | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES:**

**CO1:**Demonstrate a working knowledge of the language and procedures associated with risk management.

**CO2:** Perform risk management review for individuals and organizations.

**CO3:**Apply insurance contracts to address risk management needs of individuals and organizations.

**CO4:**Analyze information to determine if a loss exposure may be covered by property insurance contract(s).

**Module I: Concept of Risk:** Meaning- types- sources- types- measurement of risk(Theory only)- risk evaluation and prediction, risk retention and transfer. **(25 Hours)**

**Module II: Introduction to Insurance:** Nature of Insurance Contract- principles of insurance- contribution and subrogation- indemnity- need for insurance- legal aspects of insurance contract- Reinsurance, Co-insurance, Assignment. **(30 Hours)**

**Module III: Life Insurance:** Features- classification of policies- surrender value- applications and acceptance- related documents- assignments- nomination- waiver of evidence of title. **(20 Hours)**

**Module IV: General Insurance:** Types: Fire and motor, health, marine, automobile (burglary and personal accident insurance). **(18 Hours)**

**Module V: Regulation of Insurance in India:** Control of malpractices, negligence- computation of insurance premium- regulatory framework of insurance: roles, powers, functions of IRDA. **(15 Hours)**

**References:**

1. George, E. Rejda, Principles of Risk Management and Insurance, Pearson Education.
2. Dorfman, Marks S., Introduction to Risk Management and Insurance, Pearson
3. Gupta. P.K, Insurance and Risk Management, Himalaya Publishing House.
4. Mishra, M. N., Principles and Practices of Insurance, S. Chand and Sons.
5. Black, K. and H.D. Skipper, Life and Health insurance, Pearson Education
6. Crane, F., Insurance Principles and Practices, John Wiley and Sons, New York.
7. Vaughan, E. J. and T. Vaughan, Fundamentals of Risk and Insurance, Wiley & Sons

**Marks including choice:**

| <b>Module</b> | <b>Marks</b> |
|---------------|--------------|
| I             | 14           |
| II            | 17           |
| III           | 11           |
| IV            | 10           |
| V             | 8            |
| Total         | 60           |

**COURSE XVIII (DSEC): STOCK AND COMMODITY MARKETS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B18BBA</b>     | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**CO 1.** Acquire knowledge on conceptual framework of Stock Markets and Commodity Market functioning in the economy.

**CO 2.** Understand different modes of trading.

**CO 3.** Demonstrate skill in terms of stock and derivative trading.

**Module I: An overview of capital and commodity markets:** Primary Market, Secondary Market (Stock Market), Depositories, Private placements of shares / Buy back of shares, Issue mechanism. Meaning of commodity and Commodity markets, Difference between Stock Market and Commodity Market. **(18Hours)**

**Module II: Stock market:** History, Membership, Organization, Governing body, Functions of stock Exchange, on line trading, role of SEBI, Recognized Stock Exchanges in India (brief discussion of NSE BSE and Nifty). Derivatives on stocks: meaning, types (in brief). **(23 Hours)**

**Module III: Trading in stock market:** Patterns of Trading & Settlement – Speculations – Types of Speculations – Activities of Brokers – Broker Charges – Settlement Procedure, National Securities Depository Ltd.( NSDL) Central Securities Depository Ltd.( CSDL) (in brief). **(22 Hours)**

**Module IV: Commodity market:** Evolution, Commodity derivatives, Commodity exchanges- Regional & National and International, Functions, role, objectives and types- Types of transactions in Commodity market – Spot, Future and Forward options markets. **(23 Hours)**

**Module V: Trading in commodity markets:** Patterns of Trading & Settlement, Price discover, Efficiency of Commodity Markets - Size of Commodity Markets in India - Benefits of Commodity Markets. **(22 Hours)**

**References**

1. Gurusamy, Financial Markets and Institutions, 3rd edition, Tata McGraw Hill.
2. SrivastavaRM : Management of Financial Institutions, HPH
3. Saunders, Financial Markets and Institutions, 3rd edition, Tata McGraw Hill.
4. Bharat Kulkarni; Commodity Markets and Derivatives, Excel Books.
5. Khan, Indian Financial Systems, 6th edition, Tata McGraw Hill 62

**Marks including choice:**

| <b>Module</b> | <b>Marks</b> |
|---------------|--------------|
| I             | 10           |
| II            | 12           |
| III           | 15           |
| IV            | 13           |
| V             | 10           |
| <b>Total</b>  | <b>60</b>    |

**DISCIPLINE SPECIFIC ELECTIVE COURSE II****HUMAN RESOURCE MANAGEMENT****CORE COURSE XII (DSEC); HUMAN RESOURCE DEVELOPMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDITS</b> | <b>EXAM<br/>HOURS</b> |
|-----------------|--------------------|---------------------------|----------------|-----------------------|
| <b>V</b>        | <b>5B12BBA</b>     | <b>6</b>                  | <b>4</b>       | <b>3</b>              |

**COURSE OUTCOMES:**

**CO1:** Understand the HRD Practices in corporates

**CO2:** Contribute to the development and improvement of Organisation's systems and strategies leading to an optimal HRD Climate.

**CO3:** evaluates the performance management Programme

**CO4:** contribute to the development, implementation and evaluation of employee recruitment, selection and retention plans

**Module - I: Human Resource Development (HRD):** Concept, Origin and Need, Relationship between human resource management and human resource development; HRD as a Total System; Activity Areas of HRD: Training, Education and Development; Roles and competencies of HRD professionals. **(25 Hours)**

**Module - II: HRD Process:** Assessing need for HRD; Designing and developing effective HRD programs; Implementing HRD programs; Evaluating HRD programs. HRD Interventions: Integrated Human Resource Development Systems, Staffing for HRD; Physical and Financial Resources for HRD. HRD and diversity management; HRD Climate; HRD Audit. **(35 Hours)**

**Module – III: HRD Applications:** Coaching and mentoring, Career management and development; Employee counselling; Competency mapping, High Performance Work Systems, Balanced Score Card, Appreciative inquiry. Integrating HRD with technology. **(25 Hours)**

**Module – IV:** Evaluating the HRD Effort; Data Gathering; Analysis and Feedback; Industrial relations and HRD. HRD Experience in Indian Organizations, International HRD experience, Future of HRD. **(23 Hours)**



**References:**

1. Nadler, Leonard: Corporate human Resource Development, Van Nostrand Reinhold / ASTD, New York.
2. Rao T.V. and Pareek, Udai: Designing and Managing Human Resource Systems, Oxford and IBH Publication Ltd.
3. Rao T.V.: Reading in human Resource Development, Oxford IBH Publication .Ltd.
4. Viramani B.R. and Seth, Pramila: Evaluating Management Training and Development, Vision Books.
5. Rao T.V.: Human Resource Development, Sage publication.

**Marks including choice:**

| <b>Module</b> | <b>Marks</b> |
|---------------|--------------|
| I             | 14           |
| II            | 19           |
| III           | 14           |
| IV            | 13           |
| <b>Total</b>  | <b>60</b>    |

**CORE COURSE XIII (DSEC) : PERFORMANCE AND COMPENSATION  
MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B13BBA</b>     | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES:**

**CO1:** Understand concepts of performance and compensation management and how to use them to face the challenges of attracting, retaining and motivating employees to high performance.

**CO2.** Describe the process and evaluate the implications of job evaluation

**CO3.** Illustrate different ways to strengthen the pay for performance link

**CO4.** Understand the legally required employee benefits

**Module I Introduction:** Concept, Philosophy, History from performance appraisal to performance development. Objectives of performance management system; Performance management and performance appraisal; Performance Management process: Performance planning, Process and Documentation of Performance appraisal, Appraisal Interview, Performance Feedback and Counselling. **(25 Hours)**

**Module II Performance management and reward systems:** Performance Coaching ,Mentoring and Counselling, Competency development, Use of technology and e-PMS, International Aspects of PMS. Performance systems trends, Ethical Perspectives in performance appraisal. **(20 Hours)**

**Module III: Job Evaluation:** Introduction- Methods of Job Evaluation- Company Wage Policy: Wage Determination, Pay Grades, Wage Surveys, Wage Components. Modern trends in compensation - from wage and salary to cost to company concept, Comparable worth, broad-banding, competency based pay. **(20 Hours)**

**Module IV: Incentives plans for production employees and for other professionals:**

Developing effective incentive plans, pay for performance, Supplementary pay benefits, insurance benefits, retirement benefits, employee services benefits. Benefits & Incentive practices in Indian industry. **(20 Hours)**

**Module V: Wages in India:** Minimum wage, fair wage and living wage.- Methods of state regulation of wages. Wage differentials & national wage policy Regulating payment of wages, wage boards, Pay commissions, dearness allowances, linking wages with productivity,. Special

compensation situations: International compensation-managing variations. Expatriate Pay.  
(23 Hours)

**References:**

1. Milkovich & Newman , Compensation, McGraw Hill.
2. T.J. Bergman , Compensation Decision Making, Harcourt, Fort Worth, TX
3. Richard Henderson: Compensation management in a knowledge based world, Prentice Hall.
4. T.N.Chhabra & Savitha Rastogi Compensation management, Sun India Publications.
5. Gary Dessler , Human Resource Management, Prentice Hall.
6. Armstrong's Handbook of Performance Management: An Evidence-Based Guide to Delivering High Performance :Book by Michael Armstrong.
7. Bhattacharyya, D.K.: Performance management systems and strategies, Pearson Education.

**Marks including choice:**

| <b>Module</b> | <b>Marks</b> |
|---------------|--------------|
| I             | 14           |
| II            | 11           |
| III           | 11           |
| IV            | 11           |
| V             | 13           |
| <b>Total</b>  | <b>60</b>    |

**CORE COURSE XVII (DSEC): COUNSELLING AND NEGOTIATION SKILLS FOR MANAGERS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDITS</b> | <b>EXAM<br/>HOURS</b> |
|-----------------|--------------------|---------------------------|----------------|-----------------------|
| <b>VI</b>       | <b>6B17BBA</b>     | <b>6</b>                  | <b>4</b>       | <b>3</b>              |

**COURSE OUTCOMES:**

**CO1:** -Understand the behavioural issues at work place

**CO2:** Understand basic concepts of counseling and negotiations.

**CO3:** Understand the role of negotiations in organisations

**CO4:** Acquire negotiation skill to deal organizational issues

**Module I Counselling:** Introduction, Approaches to Counselling, Goals and Process of Counselling; Counselling Procedures and Skills, Organizational Application of Counselling Skills. **(25 Hours)**

**Module II Changing Behaviours through Counselling:** Specific Techniques of Counselling; Role conflicts of Managers and Counselling-Application of Counselling in Specific Organizational Situations: Dealing with problem Subordinates; Performance Management; Alcoholism and Other Substance Abuse- Ethics in Counselling. **(35 Hours.)**

**Module III Negotiation:** Introduction, Nature and need for negotiation, negotiation process, Types and styles of negotiation; strategies and tactics; barriers in effective negotiation, Communication Style, Breaking Deadlocks. **(25 Hours.)**

**Module IV Role of trust in negotiations:** Negotiation and IT; ethics in negotiation; cultural differences in negotiation styles; gender in negotiations; context of mediation; negotiation as persuasion. **(23 Hours.)**

**References:**

1. Singh Kavita - Counselling Skills for Managers (PHI)
2. Carroll, M.: Workplace counseling, Sage Publication.
3. Kottler, J. A., & Shepard, D. S.: Introduction to counselling: voices from the field, USA: Cengage Learning.
4. Moursund, J.: The Process of counselling and therapy, New Jersey: Prentice Hall.
5. Patterson, L. E., & Welfel, E. R.: The counselling process: A multitheoretical integrative approach, New York: Brooks Cole.
6. Kolb, D., & Williams, J.: The Shadow Negotiation. UK: Simon & Schuster.
7. Korobkin, R.: Negotiation theory and strategy, Aspen Publisher. 8. Lewicki, R.: Essentials of negotiation. Alexandria V. A.: Society of HRM.

**Marks including choice:**

| <b>Module</b> | <b>Marks</b> |
|---------------|--------------|
| I             | 14           |
| II            | 19           |
| III           | 14           |
| IV            | 13           |
| <b>Total</b>  | <b>60</b>    |

**CORE COURSE XVIII (DSEC): ORGANISATIONAL CHANGE AND DEVELOPMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B18BBA</b>     | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES:**

**CO1:** Understand the significance of innovation and creativity in business

**CO2:** Understand the need for Organisational change and development in the modern Organisations.

**CO3:** Adapt to changing corporate circumstances and become efficient managers in the modern era.

**CO4:** Scale up their path towards career development by means of developing their individual potentialities.

**Module I: CHANGE MANAGEMENT:** The importance and nature of change. Change and human response. Introducing change effectively: Basic steps, factors influencing change-resistance to change, overcoming resistance to change. **(25 Hours)**

**Module II: ORGANIZATION EFFECTIVENESS:** Organization effectiveness: Concept, problems in measurement of effectiveness. System - level criteria of judging effectiveness. **(23 Hours)**

**Module III: ORGANIZATIONAL DEVELOPMENT:** The nature of Organizational Development (OD): Assumptions and values. Relevant systems concepts. Action research, OD Interventions: Team interventions, Inter-group interventions, personal, interpersonal and group processes interventions: A descriptive inventory of OD interventions. **(35 Hours.)**

**Module IV: CREATIVITY & INNOVATION:** Creativity & Innovation: Meaning, Need, Components of Creativity & Innovation, Organizational Constraints, Organizational environment for Creativity & Innovation. **(25 Hours.)**

**References:**

1. Dunnette, M.D. (Ed.) (1976). Handbook of Industrial and Organizational Psychology. Chicago: Rand McNully.
2. French, W.L.; & Bell, C.H. Jr. (1980). Organizational Development. London, Prentice Hall. 3. Herbert, T.T. (1981). Dimensions of Organizational Behavior. London: MacMillan.
4. Schemerhorn, Osborn and Hunt (2012). Organisational Behaviour. Wiley Publications.
5. Khandwalla, P.N. (1988). Organizational effectiveness. In J. Pandey (Ed.) Psychology in India: The State-of-the Art (Vol.3, pp. 97-215). New Delhi: Sage.
6. Luthans, F. (1989). Organizational Behaviour. London: McGraw Hill.
7. Margulies, N.; & Raia, A.P. (1975). Organizational Development: Values, process and technology. New Delhi: Tata McGraw Hill.
8. McGill, M.E. (1977). Organizational Development for Operating Managers. AMACO (a division of American Management Association).

**Marks including choice:**

| <b>Module</b> | <b>Marks</b> |
|---------------|--------------|
| I             | 14           |
| II            | 13           |
| III           | 19           |
| IV            | 14           |
| <b>Total</b>  | <b>60</b>    |

**DISCIPLINE SPECIFIC ELECTIVE COURSE III****MARKETING****CORE COURSE XII (DSEC): CONSUMER BEHAVIOUR**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> |
|-----------------|--------------------|-----------------------|---------------|-------------------|
| <b>V</b>        | <b>5B12BBA</b>     | <b>6</b>              | <b>4</b>      | <b>3</b>          |

**COURSE OUTCOME**

**CO 1:** Understand the relevance of consumer behavior theories and concepts to marketing decisions.

**CO2:** Use appropriate techniques to apply market solutions.

**CO3:** Acquire social and ethical implications of marketing actions on consumer behaviour

**CO4:** Formulate marketing strategies that influence consumer behaviour

**Module I:** Consumer Behaviour: Nature, scope & application- Importance of consumer behaviour in marketing decisions - characteristics of consumer behavior - consumer research- consumer buying process: concepts - importance - need and elements involved in buying process - Factors influencing buying process -Economic and legal factor - Social factors - Psychological factors - Behavioral factors. **(32 - Hours)**

**ModuleII :** Consumer decision process: Types of Decision process– Models of consumer behaviour (Economic model - Psychoanalytic model - Sociological model - Howard & Sheth model) – individual determinants of consumer behavior. Group Dynamics and consumer reference groups – definition of group – Group dynamics including roles, norms, cohesiveness leadership & conformity – reference groups, Family decision making. Culture and Social class: Social stratification – characteristics of social class – Social influence on consumer – Culture, sub-culture – Problems of cross culture marketing. Diffusion of innovation – Consumer decision making for new products – brand – loyalty **(40 - Hours)**



**Module III:** Post purchase behaviour and market regulation - Defining post purchase behavior -consumer's post purchase dissonance - satisfaction - dissatisfaction. - Consumer Protection Act 1986 -rights of consumers- Profile of Indian consumers; Behavioural patterns of Indian consumers; Problems faced by Indian consumers ( 26 - Hours)

**Module IV:** Organisational buying behavior: Buying decisions involved in industrial buying process – Factors influencing industrial buying process (10 - Hours)

**Books for Reference:**

1. Consumer Behaviour : Blackwell, Miniard& Engel
2. Consumer choice Behaviour : Howard John, Hagadish and Sheth
3. Consumer Behaviour : Mehta &Subhas
4. Consumer Behaviour in India : Syam and Babu
5. Consumer Behaviour- Concepts, Applications & Choices : M.S.Raju, Dominique Xardel

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 18    |
| II     | 22    |
| III    | 14    |
| IV     | 6     |
| Total  | 60    |

**CORE COURSE XIII (DSEC) : ADVERTISING AND BRAND MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B13BBA</b>     | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

**CO 1:** Understand the fundamental theories, concepts, and frameworks in advertising and brand management

**CO2:** Apply advertising and branding techniques in different situations

**CO3:** Understanding ethical challenges related to responsible management advertising and brand strategy

**CO4 :**Acquires skill in media planning and scheduling

**Module I :** Advertising - Meaning - definition - Features - significance - Functions - Classification - Future of advertising - Definition & growth of modern advertising, advertising & the marketing mix, Social & economic aspects of advertising- AIDA model of advertising- types of ad appeals- Creativity in advertising - Concept of copy - different types of copy, copy writing, copy research , creating copy strategies, brand image, execution, USP - Advertising Effectiveness – Concept, importance, difficulties, Measurement - direct measures(historical sales method - experimental control) , indirect measures - Recall of advertising message - attitude change  
**(30- Hours)**

**Module II :** Media planning & scheduling: Introduction to broadcast & non -broadcast media; Budgeting decision rule: percentage of sales method, objective to task method, competitive parity, & all you can afford; Key factors influencing media planning; Media decisions: media class, media vehicle & media option; Scheduling: flighting, pulsing, & continuous Advertising Business - Adv Agency - Types of agency - functions and selecting an Ad agency - Adv agency and client relationship - Social implications of advertising - Moral and Ethical issues in advertising  
**(38 - Hours)**

**Module III:** Introduction to brands and brand management, Concept of a brand, brand evolution, branding challenges and opportunities, Strategic brand management process. Identifying and establishing brand positioning and values; Brand building, brand positioning and values brand repositioning. **(20 - Hours)**

**Module IV:** Designing and implementing brand strategies; Brand extension. Brand hierarchy Kapferer. Brand equity, measurement of brand equity, brand personality, brand image, managing brands overtime. Integrating advertising and brand management

**( 20- Hours)**

**Books for Reference:**

1. Aaker, Myers &Batra : Advertising Management , Prentice Hall.
2. Wells,Moriarity&Burnett : Advertising Principles & practices , Prentice Hall.
3. Sen Gupta, Subrato: Brand Positioning, Tata McGraw Hill, Delhi
4. Kapferer, J.N.: Strategic Brand Management, Kogan Page, London .
5. Kuller, K.L.: Strategic Brand Management, Prentice Hall, New Delhi.
6. Moorthy, Y.L.R.: Brand Management, Vikas Publication House, New Delhi.
7. Aaker, David A: Building Strong Brands, Free Press, New York Jones, John Philip:

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 16    |
| II     | 20    |
| III    | 12    |
| IV     | 12    |
| Total  | 60    |

**CORE COURSE XVII (DSEC) : LOGISTICS MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B17BBA</b>     | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES:**

**CO1:** Understand the structure of supply chains and the different ways through which supply chains can become competitive in the market .

**CO2:** Explain how to use the levers of the logistics strategy to redefine the points necessary to make this harmonization.

**CO3:** Analyse the importance of the term “value creation” and to propose actions in the field of management of logistics costs towards the creation of value.

**CO4:** Distinguish the forces shaping international logistics in a global market.

**CO5:** Assess accurately the risks occurred due to loss of focus on the satisfaction of end□customer demand

**Module I: Introduction to logistics:** Fundamentals of Logistics – Definition and Activities – Aims and Importance – Progress In Logistics and Current Trends- Organisation and Achieving Integration- elements and objectives of logistics management – logistics management v/s supply chain management – integrated logistics: objectives.

**(35hrs)**

**Module II: Supply Chain Management:** Meaning and definition- components/ participants of SC- concept of SCM- Objectives of SCM- SCM process - Factors driving the evolution of SCM – objectives of SCM – Bull-whip effect - supply chain planning.

**(30hrs)**

**Module III: Customer Service:** Customer relationship management, Customer service management, Demand management, Customer order fulfillment, Manufacturing flow management, Procurement management/Supplier relationship management, Returns management

**(30 hrs)**

**Module IV: Warehouse Management:** Introduction; Definitions ; Evolution of Concept of Warehousing; Importance - Benefits of Warehousing; Warehouse Operating Principles; Developing the Warehouse Resource.

**(13 hrs)**

**Books for References:**

1. Agrawal D. K., Logistics and Supply Chain Management, Macmillan, 2009
2. Raghuram G, and Rangaraj N, Logistics and Supply Chain Management, Macmillan Publication., 2000.
3. Alan Harisson & Remko van Hoek, “Logistics Management and Strategy: Competing Through the Supply Chain”, FT Press, 2011
4. Martin Christofer. “Logistics & Supply Chain management” , Pearson Education Limited, 2005

**Marks including choice:**

| <b>Module</b> | <b>Marks</b> |
|---------------|--------------|
| I             | 19           |
| II            | 17           |
| III           | 17           |
| IV            | 7            |
| Total         | 60           |

**CORE COURSE XVIII (DSEC) : RETAIL MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B18BBA</b>     | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES**

**CO 1:** Understand basic marketing theories, principles, practices and terminology related to each functional area of business.

**CO2:** Identify the ways that retailers use marketing tools and techniques to interact with their customers and perform basic functions appropriate to each functional area of business.

**CO3:** Analyse the contribution of retailers to the product value chain; consumer motivations, shopping behaviours, and decision processes for evaluating retail Offering and purchasing merchandise and services; corporate objectives, competitor analysis, and competitive strategy.

**CO4:** Understand how retailers differentiate their offering as an element in their corporate strategy and factors affecting strategic decisions involving investments in locations, supply chain and Information systems, and customer retention program.

**Module I :Introduction to Retailing-**Introduction to Retailing, Definition, Characteristics, Evolution of Retailing in India, Retailing in India, Emerging Trends in Retailing, Factors Behind the change of Indian Retail Industry.

**(22Hours)**

**Module II: Retail Formats and operations-**Retail Sales by ownership, On the basis of Merchandise offered, non - store Based retail mix & Non- traditional selling. Retail Operation: Elements/Components of Retail Store Operation, Store Administration, Store Manager – Responsibilities, Inventory Management, Management of Receipts, Customer Service, Management of Retail Outlet/Store, Store Maintenance, Store Security.

**(35Hours)**

**Module III: Store Planning-**Design & Layout, Location Planning and its importance, retailing image mix, Effective Retail Space Management, Floor Space Management. **(12Hours)**

**Module IV: Retail Marketing-**Advertising & Sales Promotion, Store Positioning, Retail Marketing-Mix, CRM, Advertising in Retailing.

**(14Hours)**

**Module V: Retail Merchandising and Merchandise Pricing-** Buying function, Mark-ups & Mark-down in merchandise management, shrinkage in Retail merchandise management. Concept of Merchandise Pricing, Pricing Options, Pricing Strategies, Pricing Objectives, Types of Pricing. **(25 Hours)**

**Books for References:**

1. Cullen & Newman: Retailing – Environment & Operations, Cengage Learning EMEA,2013
2. Berman & Evarv: Retail Management, Perntice Hall.,2017
3. Bajaj, Tuli&Srivastava: Retail Management- Oxford University Publications,2016
4. Gibson G Vedamani: Retail Management: Functional principles & practices, Jaico Publishing House.2014
5. Harjit Singh: Retail Management, S. Chand Publication,2011
6. Newman A.J. and Cullen P - Retailing : Environment and Operations (Vikas, 1st Ed.),2012
7. Berman B and Evans J.R - Retail Management (Pearson Education, 9th Ed.),2011
8. Michael Levi M and Weitz BW - Retailing Management (Tata McGraw Hill, 5th Ed.),2013
9. Dunne Patrick M., Lusch Robert F. and Griffith David A - Retailing (Cengage Learning, 4th Ed.), 2013.

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 12    |
| II     | 19    |
| III    | 7     |
| IV     | 8     |
| V      | 14    |

**PART - C****GENERIC ELECTIVE COURSES****GENERIC ELECTIVE COURSE I: CUSTOMER RELATIONSHIP MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5DO1BBA</b>     | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**Course Outcomes:**

Co1: Understand the concept of CRM in digital era with modern changes in the recent world.

Co2: Identify the dimensions to evaluate customers' satisfaction .

Co3: Apply various strategies to improve the customer loyalty and maintaining the long-term-customer relationships.

Co4: Analyse the recent initiatives taken by MNCs to improve customers' satisfaction coping-upto their expectations.

**Module I: Introduction to CRM-** CRM Definitions, Emergence of CRM practice, CRM cycle, Stakeholders in CRM, Significance of CRM, Types of CRM, Success Factors in CRM, CRM Comprehension, CRM Implementation. **(12 Hrs)**

**Module II: Customer Satisfaction-**Meaning, Definition, Significance of Customer Satisfaction, Components of Customer Satisfaction, Customer Satisfaction Models, Rationale of Customer Satisfaction, Measuring Customer Satisfaction, Customer satisfaction and marketing program evaluation, Customer Satisfaction Practices.

**(14 Hrs)**

**Module III: Emerging Perspectives:** Rural CRM, customer relationship management practices in retail industry, hospitality industry, banking industry, telecom industry, aviation industry.

**(10Hrs)**



## References

1. Alok Kumar Rai, "Customer Relationship Management-Concepts and Cases", PHI Learning Pvt. Ltd, 2012.
2. Bhasin, "Customer Relationship Management", Wiley Dream tech publishers, 2012  
Alok Kumar Rai, "Customer Relationship Management-Concepts and Cases", PHI Learning Pvt. Ltd, 2012.
3. Chaturvedi, "Customer Relationship Management", Excel Books, 2009.
4. Sheth J N, Parvatiyar A. and Shainesh G,"Customer relationship management-
5. Emerging Concepts, Tools, & Applications", Tata McGraw-Hill Education , 2009.

## Marks including choice:

| Module | Marks |
|--------|-------|
| I      | 10    |
| II     | 12    |
| III    | 8     |
| Total  | 30    |

**GENERIC ELECTIVE COURSE II: SERVICE MARKETING**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D02BBA</b>     | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**Course Outcomes:**

**CO1:** Appreciate the challenges facing the services marketing in traditional commercial marketing, e-marketing and non - commercial environments.

**CO2:** Identify the differences between marketing physical products and intangible services, including dealing with the extended services marketing mix, and the four unique traits of services marketing.

**CO3:** Recognise the challenges faced in services delivery as outlined in the services gap model.

**CO4:** Forecast the new innovations in the services industry and become the recipients of better services quality ensured by best corporates.

**Module I: Introduction-** Growth of service sector – Definition, features and types of services – designing of service – Service Marketing versus Goods Marketing- 7 P’s Services Marketing Mix-- Service marketing triangle– Service mapping . **(10Hrs)**

**Module II: Consumer Behaviour in Services Marketing-**Customer expectation of services - Factors influencing customer expectation of services - Customer perception of services - Customer satisfaction . **(6Hrs)**

**Module III : Management of Services Marketing-** Service strategy for an effective demand – Service strategy for supply – market segmentation, Targeting and Positioning. **(8 Hrs)**

**Module IV: Delivering Quality Services-**Quality gap – the customer expectation vs. actual services – Technique to augment the gap – Performance gap – Promise vs. Delivery - Strategy for augmenting the gap – Communication gap—Measuring Service Quality: SERVQUAL Scale.

**(12Hrs)**

**Reference Books**

1. S.M. Jha, “Services Marketing” Himalaya Publishing House. 2017
2. Christopher Lovelock “Services Marketing” Pearson Education, 11th edition 2017
3. Adrian Payne, “The Essence Of Services Marketing” Prentice Hall of India Pvt Ltd., 2014.
4. B Santhanam, “Services Marketing” Margham Publications, 2014
5. K. Douglas, Hoffman, John E.G. Bate Son “Essentials of Service Marketing” Dryden Press Series, 2013.
6. Helen Woodroffe – “Services Marketing” Macmillan publications, 2012.

**Marks including choice:**

| Module       | Marks     |
|--------------|-----------|
| I            | 8         |
| II           | 5         |
| III          | 7         |
| IV           | 10        |
| <b>Total</b> | <b>30</b> |

**GENERIC ELECTIVE COURSE III: E-COMMERCE**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS</b>    | <b>CREDIT</b> | <b>EXAM</b> |
|-----------------|--------------------|-----------------|---------------|-------------|
|                 |                    | <b>PER WEEK</b> |               | <b>HRS</b>  |
| <b>V</b>        | <b>5D03BBA</b>     | <b>2</b>        | <b>2</b>      | <b>2</b>    |

**Course Outcomes:**

CO1: Familiarize the basic concepts and methods of e-commerce

CO2 :Understand how e-commerce affect today's business world

CO3:Identify the precautionary measures to be followed while entering in online transactions.

CO4: Analyze factors influencing the success of e-commerce.

**Module I; Introduction to e-commerce:-** Meaning, Concept, Origin. Importance, features, benefits of e-commerce. Challenges and limitations of e-commerce. **(10Hrs)**

**Module II: Business models of e-commerce:-** B2B, B2C, C2C. Factors influencing the success of e-commerce. **(6 Hrs)**

**Module III: Electronic payment systems:-** Introduction, Online payment methods, Debit card, credit card, e-cash, e-smart card, e-cheque, e-wallet, stored value card (gift card), Electronic fund transfer(EFT), Digital currency, M-commerce. **(12Hrs)**

**Module IV: Recent trends in e-commerce:-** Digital signature, digital certificate, Biometrics Information & Technology Act 2000, Security issues in e-commerce.

**(8Hrs)**

**References**

1. Ashoke Ghose, Basics of E-commerce. Legal & Security Issues: NIIT Publisher
2. Bejajnath E-commerce, The cutting Edge of Business
3. R Kalakota E-commerce
4. Douglas, The internet book
5. Aleon, Internet in a nutshell
6. Internet and web design. R&D Wing, Mac Million
7. Rayport, Jeffrey F and Jaworksi, Bernard J, Introduction to E-Commerce, Tata Mc Graw Hill, New Delhi

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 8     |
| II     | 5     |
| III    | 10    |
| IV     | 7     |
| Total  | 30    |

**GENERIC ELECTIVE COURSE IV: EVENT MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D04BBA</b>     | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**Course Outcomes:**

CO1: Understand the concept and significance of event management.

CO2: Familiarize the techniques to improve event finance, sponsorship and cost control.

CO3 : Practice preparing time limits for event.

CO4: Develops skill for conducting an event

**Module I: Introduction to Event Management:** concepts – nature – scope – Evolution of professional event management- significance and components of events – event co ordination.

**(8Hrs)**

**Module. II: Conceptualizing and designing Event:** key elements of events – activities in event management – planning – organizing – staffing – leading – co ordination – controlling – event management information system.

**(10Hrs)**

**Module. III**

**Event Production** – Staging an event – choosing the event site – developing the theme – conducting rehearsals – providing services – arranging catering – inter personal skills. Event Marketing, Finance Management in events, Safety and security in event.

**(10Hrs)**

**Module IV: Evaluation of Event Performance:** basic evaluation process – measuring performance – formative evaluation – objective evaluation – summative evaluation – correcting deviations.

**(8Hrs)**

**References**

1. Event Marketing and Management :Sanjaya Singh Gaur &Sanjay.V.Saggere
2. Successful event management : Anton Shorie, Bryn Parry
3. Event Management : A.K.Bhatia
4. Best Practices in Modern event Management : Gold Blatt
5. Professional Event co ordination : Julia Rutherford Silvers
6. Event Planning : Judy Allen
7. Hand book of conferences and meetings b y David seekin

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 7     |
| II     | 8     |
| III    | 8     |
| IV     | 7     |
| Total  | 30    |

**GENERIC ELECTIVE COURSE V: DISASTER MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS</b>    | <b>CREDIT</b> | <b>EXAM</b> |
|-----------------|--------------------|-----------------|---------------|-------------|
|                 |                    | <b>PER WEEK</b> |               | <b>HRS</b>  |
| <b>V</b>        | <b>5D05BBA</b>     | <b>2</b>        | <b>2</b>      | <b>2</b>    |

**Course Outcomes:**

CO1: Understand the factors contributing to disaster

CO2: Acquire knowledge about the various precautionary measures to reduce the disasters

CO3: Understand the IT techniques in disaster management

CO4 : Identify the role of NGO and Govt. in disaster management

**Module I: Disaster:-** Meaning, Definition, Phases of disaster. Classification of disaster:- Natural- Flood, Cyclone, Earthquake, Landslide; Man-made- Fire, Pollution, Nuclear disaster, Biological disaster (Causes & effects) **(12 Hrs)**

**Module II: Vulnerability Analysis:-** Vulnerability:- meaning, concept. Strategic development for vulnerability analysis. Disaster Risk Reduction (DRR) **(6Hrs)**

**Module III: Disaster Management:** Pre disaster prevention, Prediction. Disaster preparedness-disaster preparedness plan; long term and short term.Warnings, safety measures. Post disaster management:- Damage assessment, remedial measures, rehabilitation. **(12Hrs)**

**Module IV: Role** of IT in disaster management: Role of Govt. NGO, Volunteers and social workers in disaster management. **(6Hrs)**

**References**

1. R.B Singh(Ed) :Disaster Management, Rawat Publications, New Delhi
2. H.K Gupta(Ed) :Disaster Management, Universiters Press, India:



3. R.B Singh : Space Technology for Disaster Mitigation in India (INCED), University of Tokyo
4. Dr. Satender : Disaster Management in Hills, Concept Publishing Co., New Delhi
5. M.C Gupta : Manuals on Natural Disaster Management in India, National Centre for Disaster Management, IIPA, New Delhi.
6. R.K Bhandani : An Overview on Natural and Manmade Disaster & their 44 Reduction, CSIR, New Delhi.
7. R.B Singh(Ed) : Environmental Geography, Heritage Publishers, New Delhi.

**Marks including choice:**

| Module | Marks |
|--------|-------|
| I      | 10    |
| II     | 5     |
| III    | 10    |
| IV     | 5     |
| Total  | 30    |

**MODEL QUESTION PAPERS**  
**I SEMESTER BBA DEGREE PROGRAMME**  
**CORE COURSE I - 1B01BBA(BBA)**  
**PRINCIPLES AND PRACTICE OF MANAGEMENT**

**Time : 3 Hours**

**Maximum : 40 Marks**

**PART – A**

Answer all questions. Each question carries 1 mark.

1. What is planning premises?
2. What is departmentation?
3. Define management?
4. What is strategy?
5. What is MBO?
6. What is motivation?

(6×1=6)

**PART - B**

Answer any 6 questions. Each question carries 2 marks.

7. What is diagonal communication?
8. What is span of supervision?
9. What is gangplank?
10. What do you mean by synergy?
11. What is centralization?
12. Explain the concept of stability of tenure?
13. What is standing plan?
14. What do you mean by science not rule of thumb method?

(6×2=12)

**PART - C**

Answer any 4 questions. Each question carries 3 marks.

15. Explain the different types of decision making?
16. Difference between centralization and decentralization?
17. Explain the principles of organizing?
18. "Planning and controlling are the two sides of the same coin". Do you agree?
19. "Coordination is the essence of management" Explain?
20. What is staffing? Explain the steps in staffing?

(4×3=12)

**PART – D**

Answer any 2 questions. Each question carries 5 marks.

21. What is directing? What are the elements of directing?
22. What do you mean by controlling? What are the techniques of controlling?
23. Explain the elements of scientific management?
24. What are the different types of organizing?

(2×5=10)

**I SEMESTER BBA DEGREE PROGRAMME  
COMPLEMENTARY ELECTIVE COURSE I-1C01BBA (BBA)  
STATISTICS FOR BUSINESS DECISIONS**

**Time : 3 Hours**

**Maximum : 40 Marks**

**PART – A**

Answer all questions. Each question carries 1 mark.

1. What is primary data?
2. Define correlation
3. What is regression?
4. What is Questionnaire?
5. What is secular trend?
6. What is price index?

(6×1=6)

**PART - B**

Answer any 6 questions. Each question carries 2 marks.

7. What do you mean by tabulation?
8. Define statistics
9. List out different methods of collection of primary data?
10. Explain the types of index numbers.
11. What is perfect correlation?
12. What do you mean by regression coefficients?
13. What are the components of time series?
14. What is scatter diagram?

(6×2=12)

**PART - C**

Answer any 4 questions. Each question carries 3 marks.

15. What are the main uses of index numbers?
16. Difference between classification and tabulation?
17. State the merits and demerits of Spearman's rank correlation method?
18. Explain moving average

19. What are the functions of statistics?

20. Explain cost of living index

(4×3=12)

### PART – D

Answer any 2 questions. Each question carries 5 marks.

21. What is meant by statistical investigation? What are the stages of statistical investigation?

22. Calculate Karl Pearson's coefficient of correlation for the following series

Price(In Rs) : 110 111 112 113 114 115 116 117 118 119

Supply(In Kg):200 210 210 240 260 280 310 400 410 420

23. Define trend. What are the various methods used to measure trend?

24. Compute Fishers ideal index and show whether it satisfies Time reversal test.

| Commodity | Base Year |     | Current Year |     |
|-----------|-----------|-----|--------------|-----|
|           | P         | Q   | P            | Q   |
| A         | 6         | 50  | 10           | 56  |
| B         | 2         | 100 | 2            | 120 |
| C         | 4         | 60  | 6            | 60  |
| D         | 10        | 30  | 12           | 24  |

(2×5=10)

**I SEMESTER BBA DEGREE PROGRAMME  
COMPLEMENTARY ELECTIVE COURSE II – 1C02BBA  
MANAGERIAL ECONOMICS**

**Time : 3 Hours**

**Maximum : 40 Marks**

**PART A**

Answer all questions. Each question carries 1 mark

1. Define managerial economics.
2. What is kinked demand curve?
3. What is price differentiation?
4. Define opportunity cost.
5. Define production function.
6. What is supply?

( 6x1=6)

**PART B**

Answer any 6 questions. Each question carries 2 marks

7. What is price skimming?
8. What is selling cost?
9. What is cost plus pricing? State its advantages.
10. What is law of demand?
11. What are the properties of an isoquant curve?
12. Give the meaning of equilibrium?
13. What is substitution effect?
14. What is diminishing marginal utility?

(6x2=12)

**PART C**

Answer any 4 question. Each Question carries 3 marks

15. Distinguish between fixed cost and variable costs.
16. Explain the features of long run average cost.
17. Explain any three pricing methods.
18. Explain the features of perfect competition.
19. Explain supply curve.
20. Explain price elasticity of demand.

(4x3=12)

**PART D**

Answer any 2questions. Each question carries 5 marks

21. Explain with suitable examples, the various determinants of demand.
22. Define monopoly. Explain how price output decisions are taken under conditions of monopoly.
23. Explain the nature and scope of managerial economics.
24. Explain cost output relationship in short run.

(5x2=10)

**II SEMESTER BBA DEGREE PROGRAMME  
CORE COURSE II - 2B02BBA  
BUSINESS ENVIRONMENT**

**Time : 3 Hours**

**Maximum : 40 Marks**

**PART A**

Answer all questions. Each question carries 1 mark

1. Define business environment
2. What is legal environment
3. What is disinvestment
4. What is an MNC
5. What is public sector Enterprise
6. Expand CSR

(6x1=6)

**PART B**

Answer any 6 questions. Each question carries 2 marks

7. What is franchising
8. What are political institutions in India
9. What is SWOT analysis
10. What is environmental scanning
11. What is Globalization
12. What is industrial pollution
13. What is New Economic policy
14. What is sub culture

(6x2=12)

**PART C**

Answer any 4 question. Each Question carries 3 marks

15. Explain the features of business environment
16. Explain micro environment factors
17. Explain the role of MNC in India
18. What are the elements in Socio cultural environment
19. Explain the Criticisms of disinvestment policy
20. What are the responsibilities of business towards Government (4x3=12)

**PART D**

Answer any 2questions. Each question carries 5 marks

21. What is business environment. What are the components of external environment
22. Explain the social responsibility of business towards different stakeholders
23. What are the main global entry strategies in globalization
24. What is environmental scanning. What techniques used in environmental scanning(5x2=10)

**II SEMESTER BBA DEGREE PROGRAMME  
CORE COURSE III - 2B03BBA  
ENTREPRENEURSHIP DEVELOPMENT**

**Time : 3 Hours**

**Maximum : 40 Marks**

**PART A**

Answer all questions. Each question carries 1 mark

1. Define Entrepreneurship?
2. What do you mean by project management?
3. What is flexibility study?
4. What do you mean by intrapreneurs?
5. What do you mean by small scale industry?
6. What do you mean by viability study? (6 x1=6)

**PART B**

Answer any 6 questions. Each question carries 2 marks

7. Describe features of entrepreneurship.
8. Explain EDP
9. Explain venture capital
10. What are the problems faced by women entrepreneur?
11. State relationship between Entrepreneurial behavior and psycho theories.
12. Explain the role of Govt. in organizing EDP
13. Describe theories of entrepreneurship.
14. How employment opportunities are generated by entrepreneurship? (6x2=12)

**PART C**

Answer any 4 question. Each Question carries 3 marks

15. Write a note on Women Entrepreneurs.
16. Explain the functions of Entrepreneurs
17. Distinguish between Entrepreneurs and managers
18. Describe any two state level financing institutions.
19. What is the difference between Intrapreneurs and entrepreneurs?
20. Describe any four types of Entrepreneurs. (4x3=12)

**PART D**

Answer any 2questions. Each question carries 5 marks

21. Write a note on rural entrepreneurship
22. Explain status of entrepreneurship in Indian industry with examples
23. Describe various stages of project management.
24. Explain women entrepreneurship in India (5x2=10)

**II SEMESTER BBA DEGREE PROGRAMME**  
**CORE COURSE III - 2C03BBA**  
**QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS**

**Time: 3 hrs**

**Max Marks: 40**

**Section A**

**Answer all questions. Each question carries 1 mark**

1. Define Mutually Exclusive Events
2. What is Type I error?
3. What is standard normal variate?
4. What is a random experiment?
5. Define exhaustive events
6. What are equally likely events?

**(6 x1=6)**

**SECTION B**

**Answer any SIX questions. Each question carries 2 marks**

7. Explain Two-Tailed Test
8. Write the characteristics of normal curve
9. What do you mean by parametric test and non parametric test?
10. What is the probability of getting a king or spade when you are drawing a card from a pack of 52 cards?
11. Describe the utilities of poisson probability distribution.
12. Explain Level of Significance
13. Give the characteristics of the Normal Distribution
14. Explain Poisson Distribution as a limiting case of Binomial Distribution. **(6 x 2 = 12 )**

**SECTION C**

**Answer any FOUR questions. Each question carries 3 marks**

15. Explain the uses of quantitative techniques in business and industry
16. What is conditional probability. If  $P(A) = 0.4$ ,  $P(B) = 0.8$ ,  $P(A \text{ intersection } B) = 0.06$ , Find  $P(A/B)$  &  $P(B/A)$
17. A basket contains 20 bad & 60 good apples. Four apples are drawn from this basket. Find the probability that of four a) at least 2 are good apples, b) utmost 2 are good apples
18. A car hire firm has two cars which it hires out day by day. The number of demands for a car on each day is distributed as a poison distribution with mean 1.5. Calculate the proportion of day on which a) neither car is used, b) some demand is refused
19. The variable X follows a normal distribution with mean 45 and SD 10. Find the probability for an item to fall a) beyond 60 b) between 40 and 56.



20. In a competitive examination, 5000 students have appeared for a paper in Maths. Their average mark was 62 and SD was 12. If there are only 100 vacancies, find the minimum marks that one should secure to get selected against a vacancy. **(4 X 3 = 12)**

### SECTION D

**Answer any TWO questions. Each question carries 5 marks**

21. In a competitive examination, 5000 students have appeared for a paper in statistics. Their average mark was 62 and standard deviation was 12. If there are only 100 vacancies, find the minimum marks that one should secure to get selected against a vacancy.
22. What is Hypothesis Testing and explain the procedure for testing of hypothesis
23. Eight coins are tossed together 256 times. Fit a binomial distribution and find the expected frequencies of heads. Also find Mean and Standard Deviation.
24. An Urn A contains 2 white and 4 black balls. Another Urn B contains 5 white and 7 black balls. A ball is transferred from the Urn A to Urn B. Then a ball is drawn from Urn B. Find the probability that it will be white. **(2 X 5 = 10)**



KANNUR UNIVERSITY  
(Abstract)

**Bachelor of Computer Application (BCA) Programme- Scheme, Syllabus and Pattern of Question Papers of Core and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.**

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Academic Branch

No.Acad.C2/12371/2019/i

Civil Station P.O, Dated 21/06/2019

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- Read:-
1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
  2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
  3. U.O No.Acad.C2/429/2017 Vol.II dated 03-06-2019
  4. The Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 07-06-2019
  5. Syllabus of Bachelor of Computer Application (BCA) submitted by the Chairperson, Board of Studies in Computer Science (UG) dated 13/06/2019

**ORDER**

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.
2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies , Workshops, discussions etc.
3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.
4. Subsequently, as per paper read (4) above, the Board of Studies in Computer Science (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core & Generic Elective of Bachelor of Computer Application (BCA) Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Computer Science (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of Bachelor of Computer Application (BCA) Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core /Generic Elective Course) of Bachelor of Computer Application (BCA)programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to report before the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of Bachelor of Computer Application (BCA) Programme are uploaded in the University website ([www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in))

Orders are issued accordingly.

Sd/-  
DEPUTY REGISTRAR (ACADEMIC)  
For REGISTRAR

To  
The Principals of Colleges offering BCA  
(Bachelor of Computer Application programme)

Copy to:-  
1. The Examination Branch (through PA to CE)  
2. The Chairperson, Board of Studies in Computer Science (UG)  
3. PS to VC/PA to PVC/PA to Registrar  
4. DR/AR-I, Academic  
5. The Computer Programmer (for uploading in the website)  
6. SE/DF/FC

Forwarded/By Order



SECTION OFFICER



# **KANNUR UNIVERSITY**

**BOARD OF STUDIES-COMPUTER SCIENCE (UG)**

***SYLLABUS FOR  
BACHELOR OF COMPUTER APPLICATIONS(B C A)  
CORE AND GENERIC ELECTIVE COURSES***

**CHOICE BASED CREDIT AND SEMESTER SYSTEM  
(OBE-Outcome Based Education System)**

**(2019 ADMISSION ONWARDS)**

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**Kannur University**  
**Vision and Mission Statement**

**Vision:**To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manantavadytaluk of Wayanad Revenue District”

**Mission:**

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region’s intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

# **KANNUR UNIVERSITY**

## **Programme Outcomes (PO)**

### **PO 1.Critical Thinking:**

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

### **PO 2.Effective Citizenship:**

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminationsand empathetic social awareness about various kinds of marginalization.
3. Internalize certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernization of the post-colonial society.

### **PO 3.Effective Communication:**

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

### **PO 4.Interdisciplinarity:**

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

## **PREFACE**

The Board of Studies in Computer Science bears deep academic venture and curriculum vision in forming the syllabus for undergraduate programme of Kannur University. The curriculum and syllabus pinpoint the creation of technical caliber of students through class room learning, workshops, seminars, presentations and summative and formative assessments.

As the present era moves with advancements in Science and Technology, the Board of Studies in computer Science of Kannur University predominantly emphasize employment-based curriculum formation to make the students extremely competent in global scenario.

Recent algorithms, Networks, Operating Systems etc. are the crux of vast developing technical dimensions of the computer science and Engineering. This curriculum and syllabus clearly states the graduate attributes/Outcomes and is developed after numerous workshops and discussions with different stakeholders. The Board of Studies in Computer Science has resolved to introduce the syllabus in the affiliated colleges for UG programme from 2019 admission onwards. I place records of gratitude to the members of board of studies, Faculties and stake holders to help me in the formation of syllabus.

Lt. Thomas Scaria

Chairperson

Board of Studies, Computer Science (UG)  
Kannur University

**KANNUR UNIVERSITY**

**Programme Specific Outcome of B.Sc. Computer Science Programme**

|      |                                                                                                                                          |
|------|------------------------------------------------------------------------------------------------------------------------------------------|
| PSO1 | Understand the concepts of Computer Science and Applications.                                                                            |
| PSO2 | Understand the concepts of System Software and Application Software.                                                                     |
| PSO3 | Understand the concepts of Algorithms and Programming.                                                                                   |
| PSO4 | Understand the concepts of Computer Networks.                                                                                            |
| PSO5 | Design, develop, implement and test software systems to meet the given specifications, following the principles of Software Engineering. |

| ITEM                                                                                                                              | PAGE NO:  |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>BCAPROGRAMME- WORK AND CREDIT DISTRIBUTION STATEMENT</b>                                                                       | <b>7</b>  |
| <b>PART A:<br/>BCA CORE COURSES- WORK AND CREDIT STATEMENT &amp; SYLLABUS</b>                                                     | <b>10</b> |
| <b>PART B:<br/>BCA GENERIC ELECTIVE COURSES- WORK AND CREDIT STATEMENT &amp; SYLLABUS<br/>(FOR STUDENTS OF OTHER DEPARTMENTS)</b> | <b>90</b> |



**KANNUR UNIVERSITY**

**BCA PROGRAMME**

**WORK AND CREDIT DISTRIBUTION STATEMENT**

| <b>Semester</b> | <b>Course Title*</b>                                                                          | <b>Credits</b> | <b>Hours per week</b> | <b>Total Credits</b> | <b>Total Hours</b> |
|-----------------|-----------------------------------------------------------------------------------------------|----------------|-----------------------|----------------------|--------------------|
| I               | Common Course – English I                                                                     | 4              | 5                     | 19                   | 25                 |
|                 | Common Course – English II                                                                    | 3              | 4                     |                      |                    |
|                 | Common Course – Additional Language I                                                         | 4              | 5                     |                      |                    |
|                 | General Awareness Course I – 1A11BCA Informatics for Computer Applications                    | 2              | 3                     |                      |                    |
|                 | Core Course I – 1B01BCA Programming In C                                                      | 2              | 2                     |                      |                    |
|                 | Core Course IV – 2B04BCA Lab I: Programming In C*                                             | 0              | 2                     |                      |                    |
|                 | Complementary Elective (Mathematics I)                                                        | 4              | 4                     |                      |                    |
| II              | Common Course – English III                                                                   | 4              | 5                     | 22                   | 25                 |
|                 | Common Course – English IV                                                                    | 3              | 4                     |                      |                    |
|                 | Common Course – Additional Language II                                                        | 4              | 5                     |                      |                    |
|                 | Core Course II – 2B02BCA Digital Systems                                                      | 3              | 3                     |                      |                    |
|                 | Core Course III – 2B03BCA Object Oriented Programming Using C++                               | 2              | 2                     |                      |                    |
|                 | Core Course IV – 2B04BCA Lab I: Programming In C*                                             | 1              | 0                     |                      |                    |
|                 | Core Course V – 2B05BCA Lab II: Programming In C++*                                           | 1              | 2                     |                      |                    |
|                 | Complementary Elective (Mathematics II)                                                       | 4              | 4                     |                      |                    |
| III             | General Awareness Course II – 3A12BCA Data Structures                                         | 4              | 4                     | 18                   | 25                 |
|                 | General Awareness Course III – 3A13BCA Database Management System                             | 4              | 4                     |                      |                    |
|                 | Core Course VI – 3B06BCA Introduction to Microprocessors                                      | 3              | 4                     |                      |                    |
|                 | Core Course VII – 3B07BCA Java Programming                                                    | 3              | 4                     |                      |                    |
|                 | General Awareness Course V – 4A15BCA Lab III: Data Structure and DBMS**                       | 0              | 3                     |                      |                    |
|                 | Core Course XI – 4B11BCA Lab IV: Java Programming, Shell Programming & Linux Administration** | 0              | 2                     |                      |                    |
|                 | Complementary Elective (Mathematics III)                                                      | 4              | 4                     |                      |                    |

|       |                                                                                                |   |   |     |     |
|-------|------------------------------------------------------------------------------------------------|---|---|-----|-----|
| IV    | General Awareness Course IV – 4A14BCA Discrete Mathematical Structures                         | 4 | 4 | 21  | 25  |
|       | Core Course VIII – 4B08BCA Operating Systems                                                   | 3 | 4 |     |     |
|       | Core Course IX – 4B09BCA Computer Organization                                                 | 3 | 4 |     |     |
|       | Core Course X – 4B10BCA Linux Administration                                                   | 3 | 4 |     |     |
|       | General Awareness Course V – 4A15BCA Lab III: Data Structure and DBMS**                        | 2 | 2 |     |     |
|       | Core Course XI – 4B11BCA Lab IV: Java Programming, Shell Programming & Linux Administration ** | 2 | 3 |     |     |
|       | Complementary Elective (Mathematics IV)                                                        | 4 | 4 |     |     |
| V     | Core Course XII – 5B12BCA Software Engineering                                                 | 3 | 3 | 16  | 25  |
|       | Core Course XIII – 5B13BCA Enterprise Java Programming                                         | 4 | 4 |     |     |
|       | Core Course XIV – 5B14BCA- Python Programming                                                  | 2 | 2 |     |     |
|       | Core Course XV – 5B15BCA Web Technology                                                        | 2 | 2 |     |     |
|       | Core Course XVI – 5B16BCA Discipline Specific Elective I                                       | 3 | 4 |     |     |
|       | Core Course XXI– 6B21BCA Lab V: Enterprise Java Programming***                                 | 0 | 3 |     |     |
|       | Core Course XXII– 6B22BCA Lab VI: Python Programming***                                        | 0 | 3 |     |     |
|       | Core Course XXIII– 6B23BCA Lab VII: Web Technology***                                          | 0 | 2 |     |     |
|       | General Elective Course                                                                        | 2 | 2 |     |     |
| VI    | Core Course XVII – 6B17BCA Design and Analysis of Algorithm                                    | 4 | 4 | 24  | 25  |
|       | Core Course XVIII – 6B18BCA Introduction to Compiler                                           | 3 | 4 |     |     |
|       | Core Course XIX – 6B19BCA Data Communication & Networks                                        | 3 | 3 |     |     |
|       | Core Course XX – 6B20BCA Discipline Specific Elective II                                       | 3 | 3 |     |     |
|       | Core Course XXI– 6B21BCA Lab V: Enterprise Java Programming***                                 | 2 | 2 |     |     |
|       | Core Course XXII– 6B22BCA Lab VI: Python Programming***                                        | 3 | 2 |     |     |
|       | Core Course XXIII– 6B23BCA Lab VII: Web Technology***                                          | 2 | 2 |     |     |
|       | Core Course XXIV – 6B24BCA Project                                                             | 4 | 5 |     |     |
| Total |                                                                                                |   |   | 120 | 150 |

\*External examination will be conducted at the end of second semester

\*\*External examination will be conducted at the end of fourth semester

\*\*\*External examination will be conducted at the end of sixth semester

Complementary Elective: Mathematics

Total Marks of the Programme- 1850 Marks (Eng 200 Marks, Additional  
Common Course 100 Marks, Core 1350, Complementary Elective 200 Marks)

**PART A**  
**BCACORE COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**(2019 ADMISSION ONWARDS)**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                                                | <b>SEMESTER</b> | <b>HOURS PER WEEK</b>       | <b>CREDIT</b> | <b>EXAM HRS</b> | <b>MARKS (INTERNAL + EXTERNAL)</b> |
|--------------------|--------------------------------------------------------------------|-----------------|-----------------------------|---------------|-----------------|------------------------------------|
| 1A11BCA            | INFORMATICS FOR COMPUTER APPLICATIONS                              | 1               | 3                           | 2             | 3               | 10+40                              |
| 1B01BCA            | PROGRAMMING IN C                                                   | 1               | 2                           | 2             | 3               | 10+40                              |
| 2B02BCA            | DIGITAL SYSTEMS                                                    | 2               | 3                           | 3             | 3               | 10+40                              |
| 2B03BCA            | OBJECT ORIENTED PROGRAMMING USING C++                              | 2               | 2                           | 2             | 3               | 10+40                              |
| 2B04BCA            | LAB I: PROGRAMMING IN C                                            | 2               | I SEM<br>2<br>II SEM<br>0   | 1             | 3               | 5+20                               |
| 2B05BCA            | LAB II: PROGRAMMING IN C++                                         | 2               | 2                           | 1             | 3               | 5+20                               |
| 3A12BCA            | DATA STRUCTURES                                                    | 3               | 4                           | 4             | 3               | 10+40                              |
| 3A13BCA            | DATABASE MANAGEMENT SYSTEM                                         | 3               | 4                           | 4             | 3               | 10+40                              |
| 3B06BCA            | INTRODUCTION TO MICROPROCESSORS                                    | 3               | 4                           | 3             | 3               | 10+40                              |
| 3B07BCA            | JAVA PROGRAMMING                                                   | 3               | 4                           | 3             | 3               | 10+40                              |
| 4A14BCA            | DISCRETE MATHEMATICAL STRUCTURES                                   | 4               | 4                           | 4             | 3               | 10+40                              |
| 4B08BCA            | OPERATING SYSTEMS                                                  | 4               | 4                           | 3             | 3               | 10+40                              |
| 4B09BCA            | COMPUTER ORGANIZATION                                              | 4               | 4                           | 3             | 3               | 10+40                              |
| 4B10BCA            | LINUX ADMINISTRATION                                               | 4               | 4                           | 3             | 3               | 10+40                              |
| 4A15BCA            | LAB III: DATA STRUCTURES AND DBMS                                  | 4               | III SEM<br>3<br>IV SEM<br>2 | 2             | 3               | 5+20                               |
| 4B11BCA            | LAB IV: JAVA PROGRAMMING, SHELL PROGRAMMING & LINUX ADMINISTRATION | 4               | III SEM<br>2<br>IV SEM<br>3 | 2             | 3               | 5+20                               |
| 5B12BCA            | SOFTWARE ENGINEERING                                               | 5               | 3                           | 3             | 3               | 10+40                              |
| 5B13BCA            | ENTERPRISE JAVA PROGRAMMING                                        | 5               | 4                           | 4             | 3               | 10+40                              |
| 5B14BCA            | PYTHON PROGRAMMING                                                 | 5               | 2                           | 2             | 3               | 10+40                              |
| 5B15BCA            | WEB TECHNOLOGY                                                     | 5               | 2                           | 2             | 3               | 10+40                              |
| 5B16BCA            | DISCIPLINE SPECIFIC ELECTIVE I                                     | 5               | 4                           | 3             | 3               | 10+40                              |
| 5D--BCA            | GENERIC ELECTIVE COURSE                                            | 5               | 2                           | 2             | 2               | 5+20                               |

|                                                                       |                                    |   |                           |   |   |       |
|-----------------------------------------------------------------------|------------------------------------|---|---------------------------|---|---|-------|
| 6B17BCA                                                               | DESIGN AND ANALYSIS OF ALGORITHM   | 6 | 4                         | 4 | 3 | 10+40 |
| 6B18BCA                                                               | INTRODUCTION TO COMPILER           | 6 | 4                         | 3 | 3 | 10+40 |
| 6B19BCA                                                               | DATA COMMUNICATION & NETWORKS      | 6 | 3                         | 3 | 3 | 10+40 |
| 6B20BCA                                                               | DISCIPLINE SPECIFIC ELECTIVE II    | 6 | 3                         | 3 | 3 | 10+40 |
| 6B21BCA                                                               | LAB V: ENTERPRISE JAVA PROGRAMMING | 6 | V SEM<br>3<br>VI SEM<br>2 | 2 | 3 | 5+20  |
| 6B22BCA                                                               | LAB VI: PYTHON PROGRAMMING         | 6 | V SEM<br>3<br>VI SEM<br>2 | 3 | 3 | 5+20  |
| 6B23BCA                                                               | LAB VII: WEB TECHNOLOGY            | 6 | V SEM<br>2<br>VI SEM<br>2 | 2 | 3 | 5+20  |
| 6B24BCA                                                               | PROJECT                            | 6 | 5                         | 4 | - | 20+80 |
| *AN INDUSTRIAL VISIT (STUDY TOUR) IS RECOMMENDED FOR THE PROJECT WORK |                                    |   |                           |   |   |       |

### LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES

| COURSE CODE | COURSE TITLE                     | SEMESTER | HOURS PER WEEK | CREDIT | EXAM HRS |
|-------------|----------------------------------|----------|----------------|--------|----------|
| 5B16BCA-E01 | INFORMATION SECURITY             | 5        | 4              | 3      | 3        |
| 5B16BCA-E02 | MOBILE COMMUNICATIONS            | 5        | 4              | 3      | 3        |
| 5B16BCA-E03 | C# AND .NET PROGRAMMING          | 5        | 4              | 3      | 3        |
| 5B16BCA-E04 | BIO-INFORMATICS                  | 5        | 4              | 3      | 3        |
| 6B20BCA-E01 | DATA MINING AND DATA WAREHOUSING | 6        | 3              | 3      | 3        |
| 6B20BCA-E02 | NETWORK PROGRAMMING              | 6        | 3              | 3      | 3        |
| 6B20BCA-E03 | DIGITAL IMAGE PROCESSING         | 6        | 3              | 3      | 3        |
| 6B20BCA-E04 | CLOUD COMPUTING                  | 6        | 3              | 3      | 3        |

### EVALUATION

| ASSESSMENT | WEIGHTAGE |
|------------|-----------|
| EXTERNAL   | 80%       |
| INTERNAL   | 20%       |

### CONTINUOUS INTERNAL ASSESSMENT FOR THEORY

| COMPONENT                                   | WEIGHTAGE | REMARKS                                                                                                                                                |
|---------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| COMPONENT1:<br>TEST                         | 80%       | MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE MARKS OBTAINED IN THE TESTS CONDUCTED. |
| COMPONENT 2:<br>ASSIGNMENT/<br>SEMINAR/VIVA | 20%       | ANY ONE COMPONENT                                                                                                                                      |

### PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

|                                         |                        |                                         |
|-----------------------------------------|------------------------|-----------------------------------------|
| <b>Part A</b>                           | <b>Short Answer</b>    | <b>6 Questions x 1 Mark = 6 Marks</b>   |
|                                         | Answer all questions   | 6 Questions x 1 Mark = 6 Marks          |
| <b>Part B</b>                           | <b>Short Essay</b>     | <b>8 Questions x 2 Marks = 16 Marks</b> |
|                                         | Answer any 6 questions | 6 Questions x 2 Marks = 12 Marks        |
| <b>Part C</b>                           | <b>Essay</b>           | <b>6 Questions x 3 Marks = 18 Marks</b> |
|                                         | Answer any 4 questions | 4 Questions x 3 Marks = 12 Marks        |
| <b>Part D</b>                           | <b>Long Essay</b>      | <b>4 Questions x 5 Marks = 20 Marks</b> |
|                                         | Answer any 2 questions | 2 Questions x 5 Marks = 10 Marks        |
| <b>Total Marks Including Choice: 60</b> |                        |                                         |
| <b>Maximum Marks for the Course: 40</b> |                        |                                         |

### CONTINUOUS EVALUATION FOR PRACTICAL

| COMPONENT                                                             | WEIGHTAGE                                                                 | REMARKS                                                                                                                |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| COMPONENT 1:<br>LAB SKILLS,<br>OBSERVATION<br>NOTE AND<br>PUNCTUALITY | 20% FOR LAB<br>SKILL<br>20% FOR<br>OBSERVATION<br>NOTE AND<br>PUNCTUALITY | OBSERVATION NOTE IS MANDATORY.<br>MARKS SHOULD BE GIVEN<br>CONSIDERING OBSERVATION NOTE<br>LAB SKILLS AND PUNCTUALITY. |
| COMPONENT1:<br>TEST                                                   | 60%                                                                       | MODEL EXAMINATION SHOULD BE<br>CONDUCTED BEFORE EXTERNAL<br>EXAM AND CONSIDERED FOR<br>INTERNAL MARK                   |

## END SEMESTER EVALUATION FOR PRACTICAL

\*EXCEPT : 2B04BCA PROGRAMMING IN C- LAB

| COMPONENT                         | PART A    | PART B |
|-----------------------------------|-----------|--------|
| Code Writing                      | 3         | 3      |
| Output                            | 3         | 3      |
| Modification for Part A or Part B | 3         |        |
| Record                            | 2         |        |
| Viva                              | 3         |        |
| <b>Total Marks</b>                | <b>20</b> |        |

### PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

|                                         |                                         |                                  |
|-----------------------------------------|-----------------------------------------|----------------------------------|
| <b>Part A</b>                           | <b>2 Questions x 10 Mark = 20 Marks</b> |                                  |
|                                         | Answer any 1 question                   | 1 Questions x 10 Mark = 10 Marks |
| <b>Part B</b>                           | <b>2 Questions x 10 Mark = 20 Marks</b> |                                  |
|                                         | Answer any 1 question                   | 1 Questions x 10 Mark = 10 Marks |
| <b>Total Marks Including Choice: 40</b> |                                         |                                  |
| <b>Maximum Marks for the Course: 20</b> |                                         |                                  |

### SEMINARS/ASSIGNMENTS/VIVA

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

### RECORDS

One rough record (Observation Note) and one fair record are compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works. Record mark is calculated at the time of End Semester Evaluation. Observation notes are compulsory in Lab hours. Students should get signature for each program done in the lab from the faculties and those programs are recommended for fair record.

## **PROJECT WORK**

Every student of B.Sc. Computer Science Programme shall have to work on a project of FIVE credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation at the end of sixth semester. Individual projects are recommended but, in an instance, where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to THREE.

## **PROJECT EVALUATION**

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. Assessment of different components may be taken as below.

### **CONTINUOUS EVALUATION FOR PROJECT**

| <b>COMPONENT</b>                                   | <b>WEIGHTAGE</b> |
|----------------------------------------------------|------------------|
| Punctuality                                        | 20%              |
| Relevance of topic System study / Design of tables | 20%              |
| Project Report                                     | 30%              |
| Presentation & Viva-voce                           | 30%              |
| <b>Total</b>                                       | <b>100%</b>      |

### **END SEMESTER EVALUATION FOR PROJECT**

| <b>COMPONENT</b>                                                 | <b>WEIGHTAGE</b> |
|------------------------------------------------------------------|------------------|
| Written Synopsis/Abstract                                        | 12.5%            |
| Content of the Project                                           | 12.5%            |
| Quality of project work/Use of software/ tools                   | 12.5%            |
| Perfection of the work (Designs of tables/ Input & Output forms) | 25%              |
| Live demo                                                        | 12.5%            |
| Viva-voce                                                        | 25%              |
| <b>Total</b>                                                     | <b>100%</b>      |



**GENERAL AWARENESS COURSE I: 1A11BCA INFORMATICS FOR  
COMPUTER APPLICATIONS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>I</b>        | <b>1A11BCA</b>     | <b>3</b>                  | <b>2</b>      | <b>3</b>            |

**COURSE OUTCOME**

**CO1:** Understand the basic concepts and functional knowledge in the field of Informatics.

**CO2:** Equip the students with fundamentals of Computer.

**CO3:** Awareness about social issues and concerns in the use of digital technology

**CO4:** Skills to enable students to use free software.

**Unit I:**

Concept of Hardware and Software: Computer Languages – Machine Language, Assembly Language, High-level Language, Language translators: Compiler, Interpreter, Assembler, Features of good language.

**(12Hrs)**

**Unit II:**

Basic Computer Organization: Von Neumann model, Input Unit, Output Unit, Storage Unit, Control Unit, Memory hierarchy, RAM, ROM, PROM and EPROM, cache memory and registers. Secondary storage devices. Storage capacity: bit, byte, nibble.

**(10Hrs)**

**Unit III:**

Introducing Input output devices with examples. Introduction to operating System: need of OS, Types of OS, Functions of OS (introduction only). Introduction to Computer Networks: definition and applications.

**(12Hrs)**

**Unit IV:**

Introduction to Linux: Basic commands in Linux such as listing files, viewing contents in files, creating and deleting directories, moving and copying files and/or directories, man pages, setting permissions on files/directories and vi editor. Steps to install Linux OS.

**(10Hrs)**

**Unit V:**

IT & Society- issues and concerns- digital divide, IT & development, free software movement, cyber ethics, cybercrime, cyber threats, cyber security, privacy issues, cyber laws, cyber addictions, guide lines for proper usage of computers, internet and mobile phones.

(10Hrs)

**Books for Study:**

1. V. Rajaraman and T. Radhakrishnan, An Introduction to Digital Computer Design, 5<sup>th</sup> Ed, PHI.
2. B.Ram, Computer Fundamentals, Architecture & Organization, 4th Ed, New Age International Publishers
3. Pradeep K. Sinha and Priti Sinha, Computer Fundamentals, 6<sup>th</sup> Ed, BPB Publications
4. Ellen Siever, Stephen Figgins, Robert Love and Arnold Robbins, Linux in a Nutshell: A Desktop Quick Reference, 6<sup>th</sup> Edition, O'Reilly

**Books for Reference:**

1. George Beekman and Eugene J. Rathswohl, Computer Confluence, Pearson
2. Alexis Leon and Mathews Leon, Fundamentals of Information Technology, Vikas Publishing
3. Barbara Wilson, Information Technology: The Basics, Macmillan International Higher Education
4. John Ray, Sams Teach Yourself Linux in 10 Minutes, Sams
5. Ramesh Bangia, Learning Computer Fundamentals, Khanna Publishers

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |

## CORE COURSE I: 1B01BCA PROGRAMMING IN C

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| I        | 1B01BCA     | 2              | 2      | 3        |

### COURSE OUTCOME

- CO1:** Understanding the basic concepts in programming.  
**CO2:** Familiarize the basic syntax and semantics of C language.  
**CO3:** Familiarize with advanced features of C.  
**CO4:** Develop skill in programming

#### **Unit I:**

Algorithms and Flow charts: Definitions, Symbols, Program: structure, top-down design, source code, object code, executable file, file extensions. Importance of C; Basic structure of C, programming style, executing a C program. Character set, C tokens, Keywords, identifiers, Constants, data types, declaration of variables, arithmetic operators, logical operators, Relational operators, Assignment operators, Increment and decrement operators, conditional operators, Bitwise operators. Precedence and order of evaluation. type conversion in expression. common programming errors, program testing and debugging, program efficiency.

**(9 Hrs)**

#### **Unit II:**

Managing Input output operation: reading a character, writing a character, formatted input output. Branching statements-if, if..else, nested if...else, else...if ladder, switch statement, goto statement. Looping statements- while, do...while, for loop. Break and continue statements.

**(7 Hrs)**

#### **Unit III:**

Arrays: One dimensional arrays, two dimensional arrays, Initializing array elements, Multidimensional arrays. Strings: declaration and initializing, reading and writing. Arithmetic operations on character. String handling functions, Functions: Library and user defined, defining a function, calling a function. Parameter passing techniques, Scope and life time of variables in function, recursive functions, arrays and functions.

**(7 Hrs)**

**Unit IV:**

Structure and union: definition, giving values to members, initialization. Array of structures, array within structure, structure within structure, union. Pointers: accessing the address of a variable, declaration and initializing pointers, accessing a variable through its pointers, pointer arithmetic, pointers and arrays (pointer to array and array of pointers), pointers and character string, pointer and functions. Dynamic memory allocation: malloc(), calloc(), free(),realloc().

**(6 Hrs)**

**Unit V:**

File Management: Text and binary files, Defining and opening a file, closing a file, input and output operations on file, error handling, random access file. Command line arguments.

**(7 Hrs)**

**Books for Study:**

1. E. Balaguruswamy, Programming in ANSI C, 7th Ed, TMH

**Books for Reference:**

1. V. Rajaraman, Computer Basics and C Programming, PHI
2. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearson
3. Yeshavant Kanetkar, Let Us C, 16<sup>th</sup>Ed, BPB
4. Noel Kalicharan, C by Example, Cambridge University Pres

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |

## CORE COURSE II: 2B02BCA DIGITAL SYSTEMS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| II       | 2B02BCA     | 3              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Introduce the basic and important concepts of Digital Principles and applications

**CO2:** Familiarize with basic building blocks of Digital systems, Digital Logic and Digital Circuits

**CO3:** Design simple combinational digital systems.

**CO4:** Familiarize different number systems, codes and data representation in digital systems

#### **Unit I:**

Introductory Digital Concepts: Digital and Analog Quantities – Binary Digits, Logic Levels and Digital Waveforms - Basic Logic - Digital IC. Number Systems: Decimal, Binary, Hexa-decimal and Octal – Conversions -CODES: BCD,ASCII, Excess-3, GRAY and UNICODE. BINARY ARITHMETIC: Addition, Subtraction. Data Representation(textbook 2): Data types - Complements (1's and 2's)– FixedPoint representation – Floating Point representation.

**(10 Hrs)**

#### **Unit II:**

Logic Gates: Inverter-AND-OR-NAND-NOR-XOR-XNOR-positive and Negative logic- Examples of IC gates. Boolean Algebra and Logic simplification: Boolean operations and Expressions – Laws and Rules of Boolean Algebra – DeMorgan's Theorem – Boolean analysis of Logic Circuits – Simplification, Standard forms and Truth tables of Boolean Expressions – K-Map , SOP, POS Minimization.

**(12 Hrs)**

#### **Unit III:**

Combinational Logic Circuits: Basic Combinational Logic Circuits – Implementing Combinational Logic – Universal Property of NAND and NOR gates. Functions of Combinational Logic: Basic overview – Basic Adders-Parallel Binary Adders-

Comparators-Decoders-Encoders-Code Converters – Multiplexers – Demultiplexers-Parity generators/checkers.

**(12 Hrs)**

**Unit IV:**

Flip Flops: Latches – Edge triggered Flip flops – Master Slave Flip flops-operating characteristics. Counters: Asynchronous counters - Synchronous counters – UP/Down synchronous counters – Design of Synchronous counters

**(10Hrs)**

**Unit V:**

Shift Registers: Basic Shift Registers Functions - Serial in/Serial Out Shift Registers - Parallel In/Parallel out Shift Registers Bidirectional Shift Registers – Shift Register Counters. Memory: Basics of Semiconductor memories – RAM – ROM – PROM – EPROM – Flash Memories

**(10 Hrs)**

**Books for Study:**

1. Thomas L. Floyd, Digital Fundamentals, 11th Ed, Pearson
2. M. Morris Mano, Computer System Architecture, 3rd Ed, Pearson

**Books for Reference:**

1. Donald P. Leach, Albert Paul Malvino and Gautam Saha, Digital Principles and Applications, 8th Ed, TMH

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |

**CORE COURSE III: 2B03BCA OBJECT ORIENTED PROGRAMMING USING  
C++**

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| II       | 2B03BCA     | 2                 | 2      | 3           |

**COURSE OUTCOME**

**CO1:** Understanding OOPs concepts such as inheritance and polymorphism and their implementation using C++.

**CO2:** Ability to develop programs in C++

**Unit I:**

Principles of object-oriented programming; OOP paradigm; Basic concepts of OOP; Benefits; applications. Introduction to C++, Structure of C++ program; Tokens, Keywords, identifiers and constants; Data types, symbolic constants; type compatibility; declaration and dynamic initialization of variables; reference variables. Operators, manipulators; type cast operators; Expressions, implicit conversions; operator overloading; operator precedence; Control structures.

**(9Hrs)**

**UnitII:**

Functions; function overloading; friend and virtual functions; Math library functions. Structures; Specifying a class; Defining member functions; making an outside function inline; nesting of member functions; private member functions; arrays within a class; memory allocation for objects; static data members; static member functions; arrays of objects; objects as function arguments; friendly functions; returning objects; const member functions; pointer to members; Local classes.

**(7 Hrs)**

**Unit III:**

Constructors and destructors; dynamic initialization of objects; copy constructor; Dynamic constructors; const objects; Destructors. Operator overloading – definition; overloading unary operators; overloading binary operators; overloading binary operators using friends; manipulation of strings using operators; rules for overloading operators. Type conversions.

**(7 Hrs)**

**Unit IV:**

Inheritance – defining derived classes; making a private member inheritance; Types of inheritance; virtual base classes; abstract classes; constructors in derived classes; Nesting of classes. Pointers; Pointers to objects; Pointers to derived classes; virtual functions; pure virtual functions.

**(6 Hrs)**

**Unit V:**

C++ streams; stream classes; unformatted I/O operations; Formatted console I/O operations; Managing output with manipulators. Files – classes for file stream operations; Opening and closing a file; file modes; file pointers and their manipulations; Sequential input and output operation.

**(7 Hrs)**

**Books for Study:**

1. E. Balagurusamy, Object Oriented Programming with C++, 7th Ed, TMH

**Books for Reference:**

1. K R. Venugopal and Raj Kumar Buyya, Mastering C++, 2<sup>nd</sup>Ed, TMH.
2. Ashok N. Kamthane, Object-Oriented Programming with ANSI and Turbo C++, Pearson
3. M. T. Somashekara, Programming in C++, 2009, PHI
4. Yeshavant Kanetkar , Let us C++, 2<sup>nd</sup> Ed, BPB

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |



**CORE COURSE IV: 2B04BCA LAB I - PROGRAMMING IN C**

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK           | CREDIT | EXAM<br>HRS |
|----------|-------------|-----------------------------|--------|-------------|
| II       | 2B04BCA     | I SEM 2 Hrs<br>II SEM 0 Hrs | 1      | 3           |

**Sample Program List**

Students have to practice all programs

1. Write a program to print the size of any five data types in C and its range.
2. Write a program to convert Fahrenheit to Celsius.
3. Write a program to accept three numbers and find the largest and second largest (if stmt)
4. Write a program to find the roots of a quadratic equation (if stmt)
5. Write a program to print all prime numbers between any 2 given limits. (while/for stmt)
6. Write a program to check whether a given matrix is an Identity matrix or not. (2D array)
7. Write a program matrix multiplication. (2D array)
8. Write a program to accept two numbers and perform various arithmetic operations (+, -, \*, /) based on the symbol entered. (switch stmt)
9. Write a recursive program to find the factorial of a number. (recursive function)
10. Write a program to check whether the string is a Palindrome. (string, 1D array)
11. Write a program to count and display the different vowels in a line of text. (string)
12. Create an employee structure and display the same. (structure)
13. Write a function to swap two numbers using pointers (pointers, call by value, call by ref)
14. Write a program to access an array of integers using pointers (pointers to arrays)
15. Create a file and store some records in it. Display the contents of the same. (file)

**DISTRIBUTION OF MARKS FOR END SEMESTER EVALUATION**

| COMPONENT                                | PART A    | PART B |
|------------------------------------------|-----------|--------|
| Code Writing                             | 3         | 3      |
| Output                                   | 3         | 3      |
| Modification for Part A or Part B        | 2         |        |
| Algorithm/Flowchart for part A or Part B | 2         |        |
| Record                                   | 1         |        |
| Viva                                     | 3         |        |
| <b>Total Marks</b>                       | <b>20</b> |        |

**PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION**

|                                         |                                         |                                  |
|-----------------------------------------|-----------------------------------------|----------------------------------|
| <b>Part A</b>                           | <b>2 Questions x 10 Mark = 20 Marks</b> |                                  |
|                                         | Answer any 1 question                   | 1 Questions x 10 Mark = 10 Marks |
| <b>Part B</b>                           | <b>2 Questions x 10 Mark = 20 Marks</b> |                                  |
|                                         | Answer any 1 question                   | 1 Questions x 10 Mark = 10 Marks |
| <b>Total Marks Including Choice: 40</b> |                                         |                                  |
| <b>Maximum Marks for the Course: 20</b> |                                         |                                  |

## CORE COURSE V: 2B05BCA LAB II - PROGRAMMING IN C++

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| II       | 2B05BCA     | 2                 | 1      | 3           |

### Sample Program List

Students have to practice all programs and record a minimum 15 programs. All programs must be based on OOP concepts.

1. Program to find the factorial of a number using recursion.
2. Program to find whether the given number belongs to Fibonacci series.
3. Program to find whether the string is palindrome or not. Use pointers.
4. Write a program to sort numbers.
5. Program to find biggest, smallest, sum and difference of two numbers using inline function.
6. Program to find the area and volume of respective figures using function overloading.
7. Program to add one day to a given date.
8. Program to add and subtract two matrices.
9. Program to multiply two matrices.
10. Program to find the trace and transpose of a matrix.
11. Program to show stack operations.
12. Create a class time comprises hr, min and sec. as member data and add() and display() as member functions. Use constructor to initialize the object. write a main function to add two time objects, store it in another time object and display the resultant time.
13. Program to negate the elements of an array. Use operator overloading function with the operator-.
14. Program to compare two strings. Use operator overloading (==). Do not use any built in functions.
15. Define a class student with name, reg.no, date of birth and name of college as member data and functions to get and display these details. Design another class Test with subjects of study and grade for each subject as member data and corresponding input and output functions. Derive a class Result from both Student and Test classes and Print the Result of each student with relevant information.
16. Start with an array of pointers to strings representing the days of the week. Provide functions to sort the strings into alphabetical order. Use pointers.

17. Create a class person with personal details. Define two functions, set details and print details. Declare array of pointers to person class and write a main function to set and print the details of n persons using pointers.
18. Design two classes A and B with member data n1 and n2 respectively. Set values for each one. Write a program to interchange the values of both A and B. Use friend function.
19. Design a class SHAPE with dimensions d1 and d2 as member data and area() as member functions to find the area of a shape. Derive three classes RECT, TRIANG and CIRCL from the class SHAPE and override the function area() of base class to find the area of individual shape. Use virtual function.
20. Write a program to show returning current object, accessing member data of current object and returning values of object using this pointer.
21. Design a class employee with relevant emp details. Read the details of n emp from the keyboard and write it into a File named empdetails. At the end of writing every n emp details read them back from the same file and display into the screen. Use separate functions to write and read into and out of the file.
22. Addition / Subtraction / Multiplication of complex numbers using classes.
23. Define a class to represent a bank account. Include the following members: Data Members:
  1. Name of the depositor.
  2. Account number.
  3. Type of account.
  4. Balance amount in the account.

#### Member Functions

1. To assign initial values.
  2. To deposit an amount.
  3. To withdraw an amount after checking the balance.
  4. To display name and balance.
24. Assume that a bank maintain two types of accounts for customers, one called as saving account and the other as current account. The saving account provides compound interest and withdrawal facilities, but no check book facility. The current account provides check book facility but no interest. Current account holders should maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class ACCOUNT that stores customer name, account number and type of account. From this derive the classes CURR\_ACCT and SAVE\_ACCT to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:
1. Accept deposit from a customer and update the balance.

2. Display the balance.
3. Compute and deposit interest.
4. Permit withdrawal and update balance.
5. Check for the minimum balance, impose penalty if necessary and update the balance.

Note: Do not use constructors. Use member functions to initialize the class members.

25. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called TRIANGLE and RECTANGLE from the base SHAPE. Add to the base class, a member function get\_data() to initialize base class data members and another member function display\_area() to compute and display the area of figures. Make display\_area() as a virtual function and redefine this function in the derived class to suit the requirements.

## GENERAL AWARENESS COURSE II: 3A12BCA DATA STRUCTURES

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| III      | 3A12BCA     | 4              | 4      | 3        |

### COURSE OUTCOME

**CO1:** Understand the concept of data structures and its relevance in computer science.

**CO2:** Familiarize with selected linear and nonlinear data structures.

**CO3:** Enhance skill in programming.

#### **Unit I:**

Data structures: Definition and Classification. Array: - Operations; Number of elements; Array representation in memory. Polynomial representation with arrays; Polynomial addition. Sparse matrix: Addition of sparse matrices. The concept of recursion. examples – factorial and Tower of Hanoi problem.

**(12 Hrs)**

#### **Unit II:**

Sorting algorithms: Insertion, bubble, selection, quick and merge sort; Comparison of Sort algorithms. Searching techniques: Linear and Binary search.

**(15 Hrs)**

#### **Unit III**

Stack: Operations on stack; array representation. Application of stack- i. Postfix expression evaluation. ii. Conversion of infix to postfix expression. Queues: Operation on queue. Circular queue; Dequeue, and priority queue. Application of queue: Job scheduling.

**(15 Hrs)**

#### **Unit IV:**

Linked list – Comparison with arrays; representation of linked list in memory. Singly linked list- structure and implementation; Operations – traversing/printing; Add new node; Delete node; Reverse a list; Search and merge two singly linked lists. Stack with singly linked list. Circular linked list – advantage. Queue as Circular linked list. Head nodes in Linked list – Singly linked list with head node – Add / delete nodes; Traversal /

print. Doubly linked list – structure; Operations – Add/delete nodes; Print/traverse. Advantages.

**(15 Hrs)**

**Unit V:**

Tree and Binary tree: Basic terminologies and properties; Linked representation of Binary tree; Complete and full binary trees; Binary tree representation with array. Tree traversal: Recursive inorder, preorder and postorder traversals. Binary search tree - Definition and operations (Create a BST, Search, Time complexity of search). Application of binary tree: Huffman algorithm.

**(15 Hrs)**

**Books for Study:**

1. Debasis Samanta, Classic Data Structures, 2nd Ed, PHI

**Books for Reference:**

2. G. A. V. Pai, Data Structures and Algorithms: Concepts, Techniques and Applications, 1st Ed, TMH
3. Ellis Horowitz, Sartaj Sahni and Dinesh Mehta, Fundamentals of Data Structures in C++, 2nd Ed, Universities Press

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |

**GENERAL AWARENESS COURSE III: 3A13BCA DATABASE MANAGEMENT SYSTEM**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| III      | 3A13BCA     | 4              | 4      | 3        |

**COURSE OUTCOME**

**CO1:** Understand the basic concepts inDBMS.

**CO2:** Skill in designingdatabase.

**CO3:**Familiarization of different DBMSmodels.

**CO4:** Skill in writing queries usingMySQL.

**Unit I:**

Introduction – purpose of Database systems. View of Data, data Models, transaction management, database structure, DBA, Data Base Users.

**(12 Hrs)**

**Unit II:**

E-R model, Basic concepts; design issues; Mapping Constraints; Keys; Primary, Foreign, candidate, E-R diagram; Weak entity set; Extended E-R features. Normal forms – 1NF, 2NF, 3NF and BCNF; functional dependency, Normalization.

**(15 Hrs)**

**Unit III:**

Relational model – Structure of Relational database. Relational Algebra; Fundamental operations; Relational calculus; Tuple and domaincalculus.

**(15 Hrs)**

**Unit IV:**

SQL: database languages; DDL; create, alter, Drop, DML, Insert into, Select, update, Delete, DCL commands, Data types in SQL; Creation of database and user.Case study: MySQL.

**(15 Hrs)**

**Unit V:**

Developing queries and subqueries; Join operations; Set operations; Integrity constraints, views, Triggers, functions and Sequences. Case study: MySQL

**(15 Hrs)**



**Books for Study:**

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database System Concepts, 6th Ed, TMH
2. Narain Gehani, The Database Book Principles and Practice Using MySQL, University Press

**Books for Reference:**

1. Elmasri Ramez and Navathe Shamkant, Fundamentals of Database System, 7th Ed, Pearson

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |

**CORE COURSE VI:3B06BCA INTRODUCTION TO MICROPROCESSORS**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| III      | 3B06BCA     | 4              | 3      | 3        |

**COURSE OUTCOME**

- CO1:** Familiarize with 8085 architecture.
- CO2:** Familiarize with 8086 architecture.
- CO3:** Skill in writing assembly language programs.
- CO4:** Understand Interrupts and DMA techniques.

**Unit I**

Introduction: History of Microprocessors, Introduction to 8-bit microprocessor - 8085, Architecture of 8085, Bus organization of 8085, Internal Data Operations and 8085 registers.

**(15Hrs)**

**Unit II**

Introduction to 16-bit microprocessor – 8086, Architecture of 8086, Functional Block Diagram, Register Organization of 8086, Signal Description of 8086, Physical Memory Organization, Memory Mapped and I/O Mapped Organization, General Bus Operation, I/O Addressing Capability.

**(15 Hrs)**

**Unit III**

Addressing Modes of 8086, Machine Language Instruction Format, Assembly Language Programming of 8086, Instruction Set of 8086-Data transfer instructions, Arithmetic and Logic instructions, Branch instructions, Loop instructions, Processor Control instructions, Flag Manipulation instructions, Shift and Rotate instructions, String instructions, Assembler Directives and operators.

**(15 Hrs)**

**Unit IV**

Introduction to Stack, STACK Structure of 8086, Interrupts and Interrupt Service Routines, Interrupt Cycle of 8086, Non-Maskable and Maskable Interrupts.

**(12 Hrs)**

## **Unit V**

Data transfer schemes – Programmed IO, Interrupt driven IO and DMA. Programmable Peripheral Interface 8255-features, architecture, DMA Controller 8257-features, architecture, Programmable Interrupt Controller 8259A -features,architecture

**(15Hrs)**

### **Books for study**

1. K. M. Bhurchandi and A. K. Ray, Advanced Microprocessor and Peripherals, 3rd Ed, TMH
2. Ramesh Gaonkar, Microprocessor Architecture, Programming, and Applications with the 8085, 6th Ed, Penram International Publishing

### **Books for Reference**

1. Douglas V. Hall, Microprocessors and Interfacing: Programming and Hardware, 2<sup>nd</sup>Ed, McGraw Hill

### **Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 12           |
| 2           | 12           |
| 3           | 12           |
| 4           | 12           |
| 5           | 12           |

## CORE COURSE VII:3B07BCA JAVA PROGRAMMING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| III      | 3B07BCA     | 4              | 3      | 3        |

### COURSE OUTCOME

- CO1:** Learn the features of java  
**CO2:** Understand the concept of error handling  
**CO3:** Learn about multi - threading  
**CO4:** Experience the GUI Programming.

#### **Unit I**

Introduction to Java programming : Java technology; history; java as a new paradigm; features of java; Java Development Kit; Java Language fundamentals; wrapper classes; arrays; strings; StringBuffer classes.

**(12 Hrs)**

#### **Unit II**

Java classes, variables, methods and constructors; Overloading and overriding; Modifiers; Packages; Interfaces.

**(15 Hrs)**

#### **Unit III**

Exception handling: Basics; handling exceptions in java; (Try, catch, finally, multiple catch, nested try, throw); Exception and inheritance; Throwing user defined exceptions; Advantages of exception handling. Multithreading: Overview; Creating threads; thread life cycle; Priorities and scheduling; synchronization; Thread groups; communication of threads; Sample programs.

**(15 hrs)**

#### **Unit IV**

Files and I/O streams: Overview; Java I/O; file streams; FileInputStream and FileOutputStream; Filter Streams; RandomAccessFile; Serialization; Applets : Introduction; Application vs. applets; Applet lifecycle; Working with Applets; The HTML APPLET tag; the java.applet Package; Sample programs.

**(15 Hrs)**

## **Unit V**

The Abstract Window Toolkit: - Basic classes in AWT; Drawing with Graphics class; Class hierarchy; Event handling; AWT controls (Labels, Buttons, checkbox, radio buttons; choice control; list, textbox, scroll bars); Layout Managers. The menu component hierarchy; Creating menus; Handling events from menu items.

**(15 Hrs)**

### **Books for Study:**

1. P. Radha Krishna, Object Oriented Programming Through Java, University Press

### **Books for Reference:**

1. E. Balagurusamy, Programming With JAVA, 5th Ed, TMH
2. Herbert Schildt, Java 2: The Complete Reference, 5th Ed, TMH

### **Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 14           |
| 2           | 11           |
| 3           | 13           |
| 4           | 11           |
| 5           | 11           |

**GENERAL AWARENESS COURSE IV: 4A14BCA DISCRETE  
MATHEMATICAL STRUCTURES**

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| IV       | 4A14BCA     | 4                 | 4      | 3           |

**COURSE OUTCOME**

**CO1:** Fundamental mathematical concepts and terminology for Computer Science

**CO2:** Acquire knowledge in Mathematical Logic

**CO3:** Gain knowledge in Boolean Algebra and Group Theory

**CO4:** Awareness about the importance of Graph Theory in Computer Science

**Unit I**

Sets and Mathematical Logic: Set Theory - Types of sets, Set operations, Principles of Inclusion and Exclusion. Mathematical Logic - Propositional Calculus - Statement, Connectives, Conditional and Biconditional, Equivalence of Formula, Well Formed Formula, Tautologies, Normal Forms, Theory of Inference for the Statement Calculus, Predicate Calculus, Theory of Inference for the Predicate Calculus.

**(12 Hrs)**

**Unit II**

Functions and Relations: Functions – Types of Functions, Composition of Functions and Inverse Functions. Relations - Relations and Their Properties, Functions as relations, Closure of Relations, Composition of relations, Equivalence Relations and Partitions. Partial Ordering, Hasse Diagram. The Pigeonhole Principle.

**(15 Hrs)**

**Unit III**

Lattices and Boolean Algebra - Lattices and Algebraic Systems, Principles of Duality, Basic Properties of Algebraic Systems Defined by Lattices, Distributive Lattices and Complemented Lattices. Boolean Lattices and Boolean Algebras. Boolean Functions and Boolean Expressions.

**(15 Hrs)**

#### **Unit IV**

Group Theory – Definition and Elementary Properties - Permutation Groups, Cyclic Groups – Subgroups - Cosets, Semigroup and Monoid. Homomorphism and Isomorphism. Rings, Integral Domains and Fields.

**(15 Hrs)**

#### **Unit V**

Graph Theory- Basic concepts- Introduction, Directed Graph, Undirected Graph, Connected and Disconnected Graphs, Bipartite Graph, Complete Bipartite Graph, Isomorphic Graphs, Subgraph. Paths and Circuits. Shortest Paths in Weighted Graphs- Dijkstra's Algorithm. Eulerian Paths and Circuits, Hamiltonian Paths and Circuits. Storage representation and manipulation of graphs. Minimum Spanning Trees.

**(15 Hrs)**

#### **Books for Study:**

1. Kenneth H. Rosen and Kamala Krithivasan, Discrete Mathematics And Its Applications with Combinatorics and Graph Theory, 7<sup>th</sup> Ed, TMH

#### **Books for Reference:**

1. J. K. Sharma, Discrete Mathematics, 2004, Macmillan Publishers India Limited
2. Alan Doerr, Kenneth Levasseur, Applied Discrete Structures for Computer Science, Galgotia Publications Pvt Ltd
3. N Ch S N Iyengar, V. M. Chandrasekaran, K. A. Venkatesh and P. S. Arunachalam, Discrete Mathematics, Vikas Publishing
4. C. L. Liu and D. P. Mohapatra, Elements Of Discrete Mathematics (SIE), 4<sup>th</sup> Ed, TMH

#### **Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 12           |
| 2           | 12           |
| 3           | 12           |
| 4           | 12           |
| 5           | 12           |

## CORE COURSE VIII: 4B08BCA OPERATING SYSTEMS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| IV       | 4B08BCA     | 4              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Understand the basic concepts, structure and functions of operating systems.

**CO2:** Understand the principles behind the techniques in resource management

**CO3:** Knowledge about the basic design of the OS

#### **Unit I**

OPERATING SYSTEMS OVERVIEW: Operating System Definition, Functions, OS as a resource manager, Types of OS, Evolution of OS, OS Structure, Operating system operations, Process Management, Memory Management, Storage Management, Protection and Security, Operating System Services, User Operating System Interface, System Calls, OS design and implementation, Operating System Structure. (Text 1)

**(14 Hrs)**

#### **Unit II**

PROCESS MANAGEMENT: Processes: Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication. CPU Scheduling: Basic concepts, scheduling criteria, Scheduling algorithms. Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock. (Text 1)

**(18 Hrs)**

#### **Unit III**

MEMORY MANAGEMENT: Memory management: Single contiguous allocation, Partitioned allocation, Relocatable partitioned, Paging, Demand paging, Segmentation, Segmentation and demand paging, Other schemes. (Text 2)

**(14 Hrs)**

#### **Unit IV**

STORAGE MANAGEMENT: Mass Storage Structure: Overview, Disk Scheduling: (FCFS, SSTF, SCAN, C-SCAN, Look), Disk Management. RAID Structure. (Text 1)



(14 Hrs)

**Unit V:**

File System interface: File Concepts, Directory and Disk Structure.

Protection: Protection: Goals of protection, principles of protection, domain of protection, access matrix. (Text 1)

(12 Hrs)

**Books for Study:**

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, 9th Edition, John Wiley and Sons Inc., 2012
2. Stuart E. Madnick and John J Donovan, “Operating Systems”, Tata McGraw-Hill, 2005

**Books for Reference:**

1. Andrew S. Tanenbaum, Herbert Bos, Modern Operating Systems, 4th Ed, Pearson
2. Dhananjay M. Dhamdhere, Operating Systems A Concept Based Approach, 3rd Ed, TMH

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 13    |
| 2    | 14    |
| 3    | 11    |
| 4    | 11    |
| 5    | 11    |

## CORE COURSE IX: 4B09BCA COMPUTER ORGANIZATION

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| IV       | 4B09BCA     | 4                 | 3      | 3           |

### COURSE OUTCOME

**CO1:** Understand the basic operation of a computer system.

**CO2:** Understand the organization and design of basic digital computer

**CO3:** Introduce the concepts of microprogramming and design simple combinational digital systems.

**CO4:** Understand the organization of memory and techniques that computers use to communicate with I/O devices

#### **Unit I**

Functional Units and Basic operational Concepts of a digital computer (Textbook 2). Register Transfer and Micro operations: Register Transfer Language-Register Transfer-Bus and memory Transfer. Basic Computer Organization and Design: Instruction Codes – Computer Registers-Computer Instructions-Timing and Control-Instruction cycle-Memory Reference Instructions-I/O and Interrupt-Complete Computer Description-Design of Basic Computer.

**(18 Hrs)**

#### **Unit II**

Micro Programmed Control: Control Memory – Address sequencing – Microprogram Example -Design of Control Unit. Central Processing Unit – General Register Organization – Stack Organization - Instruction Formats – Addressing modes – Data Transfer and Manipulations- Program Control – Reduced Instruction set computer(RISC).

**(18 Hrs)**

#### **Unit III**

Input Output Organization: Peripheral Devices – Input/output Interfaces – Asynchronous Data Transfer – Modes of transfer –Priority Interrupt – Direct Memory Access (DMA) - Input Output Processor - Serial Communications.

**(12 Hrs)**

**Unit IV**

Memory Organization: Memory Hierarchy – Main memory – Auxiliary Memory – Associative Memory – Cache memory – Virtual Memory.

(12 Hrs)

**Unit V**

Pipelining: Parallel processing – Pipelining – Instruction pipeline. Multiprocessors: Characteristics of multiprocessors – Inter connection structures – Inter Processor Arbitration.

(12 Hrs)

**Books for Study:**

1. M. Morris Mano, Computer System Architecture, 3rd Ed, Pearson
2. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, Computer Organization, 5th Ed, TMH

**Books for Reference:**

1. William Stallings, Computer Organization and Architecture. 10th Ed, Pearson
2. John P. Hayes, Computer Architecture And Organization, 3rd Ed, TMH

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |

## CORE COURSE X: 4B10BCA LINUX ADMINISTRATION

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| IV       | 4B10BCA     | 4              | 3      | 3        |

### COURSE OUTCOME

**CO1:** To learn basic Linux commands and understand the file system structure

**CO2:** To understand the Boot loaders and the configuration files

**CO3:** To learn different system services, maintenance and configuring these

**CO4:** To experience Shell Scripting

#### **Unit I**

**Linux OS:** History, Features and benefits of Linux, basic concepts of multi user system, open source, free Software concepts, Types of users in Linux, Types of files. **BASICS :** login, password, creating an account, shell and commands, logout, changing password, files and directories, relative and absolute pathnames, directory tree, current working directory, referring home directory, creating new directories, copying files, moving files, deleting files and directories , wild cards, hidden files, cat command

**(18Hrs)**

#### **Unit II**

**Vi editor:** different modes-command mode, insert mode, last line mode, vi Editing commands – moving within a file, deleting, editing,Copy and Paste Commands, Saving and Closing the file, redirecting input/output-filter, pipes. **File permissions:** user, group, ls command (long listing), changing file permission.

**(15Hrs)**

#### **Unit III**

**Shell Scripting:** Types of shell, Basic shell configuration for bourne and bash shell: /etc/profile, /etc/bashrc, ~/.bash\_profile, ~/.bash\_login, ~/.profile, ~/.bashrc, ~/.bash\_logout, ~/.bash\_history. Bourne shell scripts, script execution, variables and parameters, Control structures - Shell if then else, Shell if then elif, Shell for loop, Shell while loop, Shell until loop , Shell case, Shell function.

**(15Hrs)**

#### **Unit IV**

**Linux Boot process:** LILO - boot process, /etc/lilo.conf file, GRUB - /etc/grub.conf file  
runlevels, rc files, startup scripts. **Mounting: mounting** file systems, structure of  
/etc/fstab. **Linux Administration :** Major services in Linux system - init, /etc/inittab file,  
login from terminal, syslog and its configuration file /etc/syslog.conf, periodic command  
execution: at and cron, crontab file , GUI, X windows. Starting and stopping different  
services – service command.

(12Hrs)

#### **Unit V:**

**System Maintenance:** tmpwatch command, logrotate utility. **Backup and Restore:**  
types of backup - full, differential, incremental, cp, tar commands. **Linux Installation:**  
**Partitioning,** MBR, SWAP, file system mount points, rpm utility - installation of  
packages

(12Hrs)

#### **Books for Study:**

1. Yashavant Kanetkar, UNIX Shell Programming, BPB
2. Aileen Frisch, Essential System Administration, 3rd Edition, O'Reilly Media

#### **Books for Reference:**

1. Arnold Robbins, Unix in a Nutshell, 4th Edition, O'Reilly Media
2. Evi Nemeth, Garth Snyder and Trent R. Hein, Linux Administration Handbook,  
2nd Ed, Prentice Hall
3. Christopher Negus, Red Hat Linux Bible, John Wiley & Sons
4. Rebecca Thomas, Jean Yates, A User Guide to the Unix System, McGraw Hill

#### **Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 12           |
| 2           | 12           |
| 3           | 12           |
| 4           | 12           |
| 5           | 12           |

**GENERAL AWARENESS COURSE V: 4A15BCA LAB III: DATA**

**STRUCTURES & DBMS**

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK             | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------------------|--------|-------------|
| IV       | 4A15BCA     | III SEM 3 HRS<br>IV SEM 2 HRS | 2      | 3           |

**Sample Program List**

**Section A: DATA STRUCTURE**

1. Add two polynomials.
2. Sequential and binary search : Print number of comparison in each case for given datasets.
3. Insertion sort: number of comparisons and exchanges for given data sets.
4. Bubble sort: Print number of comparisons and exchanges for given data sets.
5. Selection sort: Print number of comparisons and exchanges for given data sets .
6. Quick sort.
7. Stack operation: addition and deletion of elements
8. Queue operation: addition and deletion of elements
9. Conversion of infix expression to postfix.
10. Menu driven program: to add / delete elements to a circular queue. Include necessary error messages.
11. Singly linked list operations : add a new node at the beginning, at the end, after ith node, delete from beginning, end, print the list.
12. Circular linked list : add a new node at the beginning, at the end, after ith node, delete from beginning, end, print the list.
13. Doubly linked list : add a new node at the beginning, at the end, after ith node, delete from beginning, end, print the list.
14. Implement tree traversal.
15. Merge two sorted linked list.

**Section B: DBMS**

Minimum 10 exercises covering SQL related topics. Sample exercises are given below:

**SQL -1**

Create table students with fields sno, sname, sex, mark with sno as primary key and assign suitable constraints for each attribute. Insert five records into the table.

1. Alter the table by adding one more field rank.
2. Display all boy students with their name.

3. Find the Average mark
4. Create a query to display the sno and sname for all students who got More than the
5. average mark. Sorts the results in descending order of mark.
6. Display all girl student names for those who have marks greater than 20 and less than 40.

### SQL -2

Create a table department with fields ename, salary, dno, dname, place with dno as primary key. Insert five records into the table.

1. Rename the field 'place' with 'city'
2. Display the employees who got salary more than Rs.6000 and less than 10000 /-
3. Display total salary of the organization
4. Display ename for those who are getting salary in between 5000 and 10000.
5. Create a view named 'Star' with field ename, salary & place
6. Display ename and salary with salary rounded with 10 digits '\*'

### SQL -3

Create a table department with fields dno, dname, dmanager and place with dno as primary key.

Create a table emp with fields eno, ename, job, dno, salary, with eno as primary key. Set dno as foreign key.

Insert five records into each table.

1. Display the ename and salary, salary with ascending order
2. Display ename and salary for eno=20,
3. Display the manager for the accounting Department
4. Display the name, salary and manager of all employees who are getting salary > 5000
5. Write the queries using various group functions.
6. Write the queries using various Number functions.

### SQL -4

Create a table emp with fields eno, ename, job, manager and salary, with eno as primary key. Insert values into the table.

1. Display ename, salary from emp who are getting salary more than average salary of
2. the organization.
3. ADD 20% DA as extra salary to all employees. Label the column as 'New Salary'
4. Create a query to display the eno and ename for all employees who earn more than the average salary. Sort the results in descending order of salary.
5. Create a view called emp\_view based on the eno, ename from emp table change the heading for the ename to 'EMPLOY'.

6. Write a query that will display the eno and ename for all employees whose name contains a 'T'.

### SQL -5

Create a table department with fields dno, ename, salary, Designation, dname and place with dno as primary key. Insert values into the table.

1. Write the queries using various Character functions in ename field.
2. Create a query to display the employee number and name for all employees who earn more than the average salary. Sort the results in descending order of salary.
3. Display all employees who got salary between 5000 & 10000
4. Display ename, salary, Designation for those who got salary more than 5000 or his Designation is 'clerk'.
5. Display ename and designation those who are not a clerk or manager.
6. Display the names of all employees where the third letter of their name is an 'A'

### SQL -6

Create a table Customer with fields cid, cname, date\_of\_birth and place

Create table loan with fields loanno, cid and bname assigning suitable constraints.

Create table depositor with fields accno, cid, balance and bname assigning suitable constraints.

Insert 5 Records into each table.

1. Add one more field amount to loan table. Update each record. Display cname for cid=2.
2. Calculate Rs 150 extra for all customers having loan. The added loan amount will
3. display in a new column.
4. Display loanno, cname and place of a customer who is residing in Kannur city.
5. Display all information from loan table for loanno 2,8,10.
6. Display all customers who have both loan and deposit.



**CORE COURSE XI: 4B11BCA LAB IV: JAVA PROGRAMMING, SHELL  
PROGRAMMING & LINUX ADMINISTRATION**

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK             | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------------------|--------|-------------|
| IV       | 4B11BCA     | III SEM 2 HRS<br>IV SEM 3 HRS | 2      | 3           |

**Sample Program List**

**SECTION A: JAVA PROGRAMMING**

1. Write a java program to perform various string operations using java class.
2. Write java program to implement interface.
3. Write java program that handles various exceptions. Use try –catch statement.
4. Write java program to implement file I/O operation using java iostreams.
5. Write java program to implement Applet life cycle.
6. Write java program to implement a calculator using suitable AWT controls.
7. Write java program to implement packages.
8. With API suport write demo programs for menu display
9. Write a java program to demonstrate threads.
10. Demonstration of FileInputStream Stream and FileOutputStream Classes

**SECTION B: SHELL PROGRAMS**

1. Get a name and number from the user, create a file with that name and number. Also display the contents of the file.
  - If the name is XXX and number is 2 the filename must be XXX\_2
  - use cat command to create a file
  - Create the file with 10 different lines, then display the first 5 lines of file using head command.
2. Write a program to greet a user by 'Good Morning', Good Afternoon' or 'Good Evening' based on time
  - get the system time using 'date' command

- Read the name from the user
  - if the name is 'XXX' then greet with 'Hello XXX, Good Morning! '
3. Write a shell program to check whether a number is positive,negative or zero
  4. Shell Script To Print A Number In Reverse Order
  5. Write a program to check whether a user has logged in or not. The username is passed as command line argument
  6. Write a demo program for the number and string comparison operators
    - verify whether the entered username and password is of admin user's if so display a warning message 'Permission denied'
    - read a number from the user. Check whether number of files in a folder is greater than the read number
  7. Write a demo program using basic calculator
    - find the average size of the files available in a folder
  8. A program to create 10 users
    - use loop structure
    - get the usernames from the user
    - assign same password to all the users
  9. A demo program to test different file operators
    - read filename from the user
      - Check if the file exists, if exists then display the contents, otherwise create the file
      - Check whether the size of the file is zero
      - check whether the file is having read, write and execute permission
  10. Write a program with 3 different functions. Use Menu driven program and invoke the function accordingly
    - Function for listing the contents of a folder
    - Function for checking whether a file is available in a folder or not if so display the contents
    - Function to check whether an user is already a member of a group

## **LINUX ADMINISTRATION**

1. Linux installation, upgradation and rescue.
2. Boot loader configuration using GRUB
3. Managing the run level.
4. Starting and stopping services in runlevel.
5. The service command
6. Managing process- viewing status, killing, restarting etc using ps.
7. Adding and deleting user accounts, changing passwords.
8. Changing the environment variables like PATH
9. Scheduling jobs using cron
10. Managing kernel modules
11. Mounting and unmounting external file systems
12. Setting the value of umask, changing the permissions, changing owner and groups
13. Installation and removal of packages
14. Installation of a peripheral devices (eg printer)
15. Archiving and Backup using tar. Restoring backup
16. Compressing and uncompressing files using any one tool

## CORE COURSE XII: 5B12BCA SOFTWARE ENGINEERING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5B12BCA     | 3              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Understand the basic processes in software Development lifecycle.

**CO2:** Familiarize with different models and their significance.

**CO3:** Familiarize with requirement engineering and classical software design techniques.

**CO4:** Familiarize with various software testing techniques and tools.

#### **Unit I**

Introduction to software engineering-Definition, program versus software, software process, software characteristics, brief introduction about product and process, software process and product matrices; Software life cycle models – Definition, waterfall model, increment process model, evolutionary process model, selection of the life cycle model.

**(10Hrs)**

#### **Unit II**

Software Requirement Analysis and Specification – Requirements engineering, types of requirements, feasibility studies, requirement elicitation, various steps of requirement analysis, requirement documentation, requirement validation.

**(10Hrs)**

#### **Unit III**

Software design – definition, various types, objectives and importance of design phase, modularity, strategy of design, function-oriented design, IEEE recommended practice for software design descriptions.

**(12Hrs)**

#### **Unit IV**

Object Oriented Design – Analysis, design concept, design notations and specifications, design methodology.

**(8Hrs)**

## Unit V

Software Testing – What is testing, Why should we test, who should do testing? Test case and Test suit, verification and validation, alpha beta and acceptance testing, functional testing , techniques to design test cases , Boundary value analysis, equivalence class testing, decision table based testing; structural testing , path testing , Graph matrices , Data flow testing , levels of testing ,unit testing , integration testing, system testing , validationtesting

(14Hrs)

### **Books for Study:**

1. K. K. Aggarwal, Yogesh Singh, Software Engineering, 3<sup>rd</sup> Ed, New Age International Publication (For unit 1,2,3,5 and case study of unit4)
2. Pankaj Jalote, An Integrated Approach toSoftwareEngineering, 2<sup>nd</sup> Ed, Narosa Publishing House (For Unit 4)

### **Books for Reference:**

1. Ian Sommerville, Software Engineering, 10th Ed, Pearson
2. Roger S Pressman, Software Engineering: A Practitioner's Approach, 6th Ed, TMH
3. Carlo Ghezzi, Mehdi Jazayeri and Dino Mandrioli, Fundamentals of Software Engineering, 2nd Ed, Pearson

### **Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |

### CORECOURSE XIII: 5B13BCA ENTERPRISE JAVA PROGRAMMING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5B13BCA     | 4              | 4      | 3        |

#### COURSE OUTCOME

**CO1:** Understand the Enterprise Java platform

**CO2:** Learn APIs and runtime environment for developing and running large scale Projects.

**CO3:** Develops programming skills in multi – tiered, scalable, reliable and secure Network application.

**CO4:** Understand the structure of a web application.

#### **Unit I**

Java Database Connectivity: JDBC architecture; Drivers, JDBC-ODBC bridge, native API partly java driver, Net Protocol all Java driver, Native protocol all Java driver; Connecting to Database; statements; Large data types; Dates and Times; Handling Errors; SQL warning; Metadata, database meta data, result set meta data

**(15 Hrs)**

#### **Unit II**

Remote Method Invocation: RMI architecture; RMI Object services; Naming/registry service, object activation service, distributed garbage collection; Defining Remote objects; Key RMI classes for remote object implementations; Stubs and skeletons; Accessing remote object as a client; Remote method arguments and return values; Dynamically loaded classes; Configuring clients and servers for remote class loading;

**(15 Hrs)**

#### **Unit III**

Java Servlets: Life cycle; HTTP Servlets, forms **and** interaction; **POST**, HEAD and other requests; Servlet requests; Servlet responses; Error handling, status codes; Custom Servlet Initialization; Thread safety; Cookies; Session tracking

**(15 Hrs)**

#### **Unit IV**

Common Object Request Broker Architecture: Introduction to CORBA, CORBA

architecture, CORBA versus Java RMI, IDL Compiler, Interface definition language, IDL stub, IDL Skelton interface, Object Request Broker; Naming service; Inter-ORB communication.

(12 Hrs)

### **Unit V**

Creating CORBA objects; Creating IDL modules, interfaces, data members and methods; IDL and Java; Simple server class, helper class, holder class, client stubs and server skeltons; Writing the implementation class; Initializing ORB, Registering with a naming service; Adding objects to a naming context; Finding remote objects; Initial ORB references; Getting objects from other Remote objects.

(15 Hrs)

### **Books for Study:**

1. Java Enterprise in a Nutshell by David Flanagan and Jim Parley, O'Reilly Associates Inc.

### **Books for Reference:**

1. David Flanagan, Jim Farley and and William Crawford, Java Enterprise in a Nutshell, 2nd Edition, O'Reilly Media
2. Jim Keogh, J2EE: The Complete Reference, 1st Ed, TMH
3. C. Nellai Kannan, Java & J2EE, Nels Publication
4. Thomas J. Mowbray and William A. Ruh, Inside CORBA: Distributed Object Standards and Applications, Addison Wesley

### **Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 14           |
| 2           | 13           |
| 3           | 13           |
| 4           | 10           |
| 5           | 10           |

## CORE COURSE XIV:5B14BCA PYTHON PROGRAMMING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5B14BCA     | 2              | 2      | 3        |

### COURSE OUTCOME

**CO1:** Learn Python for expressing computation

**CO2:** Familiarize with functions and modules in python

**CO3:** Understand object-oriented programming concepts in Python

**CO4:** Learn the techniques for database connectivity and GUI programming in Python

#### **Unit I**

**Basic Elements and Control Statements:** Features of Python, Different Methods to Run Python, Basic Elements (Objects, Expressions, Numerical Types, Strings, Variables), Comments, Indentation in Python, Input and Output in Python, import function, Operators in Python, Branching (if, else, elif), Iteration (while, for), range and enumerate functions, Tuples, Lists, Sets, Dictionaries, Built-in methods of lists, sets and dictionaries, Mutable and Immutable Objects.

**(8 Hrs)**

#### **Unit II**

**Functions, Modules and Exception Handling:** Functions Definition, Function Calling, Function Arguments (Required, Keyword, Default), Recursion, Modules, Built-in Modules, Creating Modules, File Handling (Opening, Closing, Writing, Reading), Exceptions, Built-in Exceptions (IndexError, OverflowError, ZeroDivisionError, RuntimeError), Exception Handling.

**(8 Hrs)**

#### **Unit III**

**Object Oriented Programming, Arrays and Data Visualization:** Class Definition, Object Creation, Built-in Attribute Methods, Object Oriented Programming Features of Python. Arrays in Python, Numpy Module, ndarray, Creating Arrays (array, zeros, ones, empty, linspace, arrange, random), Two-Dimensional Array, Indexing, Slicing, Iterating, Copying, Splitting, Shape Manipulation (reshape, transpose, resize), Arithmetic Operations on Arrays. Data Visualization in Python matplotlib Module, pyplot, plot(),



scatter, bar charts, Formatting, figure(), subplot(), text(), xlabel(), ylabel(), title(), Plotting Simple Mathematical Functions ( $\sin x$ ,  $x^2$ ).

**(8 Hrs)**

#### **Unit IV**

**Connecting to Database:** Connecting to a Database, Basic Operations on Database (Crater, Insert, Update, Delete), Fetching Data from a Database, Transaction Control.

**(6 Hrs)**

#### **Unit V**

**GUI Programming:** GUI Programming using Tkinter, Tkinter Widgets (Label, Message, Entry, Text, Button, tkMessageBox, RadioButton, Checkbutton, Listbox, Menu, Menubutton, Scale, Scrollbar, Canvas), Layout Managers.

**(6 Hrs)**

#### **Books for Study:**

1. Dr. Jeeva Jose, Taming Python By Programming, Khanna Publishing
2. John V. Guttag, Introduction to Computation and Programming Using Python with Application to Understanding Data, PHI (2016)
3. <https://www.numpy.org/devdocs/user/quickstart.html>
4. [https://matplotlib.org/users/pyplot\\_tutorial.html](https://matplotlib.org/users/pyplot_tutorial.html)

#### **Books for Reference:**

1. Charles Dierbach, Introduction to Computer Science using Python, Wiley (2015)
2. <https://www.tutorialspoint.com/python/>
3. Python for Education by Ajith Kumar B P
4. <https://docs.python.org/3/tutorial/index.html>
5. Introduction to Computer Science and Programming Using Python Provided by Massachusetts Institute of Technology (MITx) - Available at : (<https://www.edx.org/course/introduction-to-computer-science-and-programming-using-python-2>)

**Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 12           |
| 2           | 12           |
| 3           | 12           |
| 4           | 12           |
| 5           | 12           |

## CORE COURSE XV:5B15BCA WEB TECHNOLOGY

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5B15BCA     | 2              | 2      | 3        |

### COURSE OUTCOME

**CO1:** Enable students to program for the World Wide Web using HTML, JavaScript, PHP and MySQL.

**CO2:** Create static and dynamic web pages PHP and MySQL.

**CO3:** Impart basic knowledge in relational databases, SQL and, Client-server model.

#### **Unit I**

Introduction to internet and web, An overview of internet programming –WWW design issues. Introduction to HTML-structure of HTML, tags, attributes, syntax of tags, starting and ending tags, html doc elements-<html>, <title>,<body>,physical style tags, listing, labeling, grouping, <img>-<a>

**(8 Hrs)**

#### **Unit II**

Table tags-<tr>,<td>,<th> attributes-height, width, rowspan, colspan, border, color. Form-tag attributes-type-passwd, submit, radio, check, method, action. Frame-<frame>, <frameset>, <iframe>,<noframe> and other important tags and attributes.

**(6 Hrs)**

#### **Unit III**

Javascript-datatypes, variables, function, object, array.Client-side object hierarchy and document. object Model, <script>, event handlers, javaScript in urls. Windows and frames dialog boxes, status line, navigator object, opening Windows, closing windows, Location object, history object. - Date object- math object- Accessing form object.

**(11 Hrs)**

#### **Unit IV**

Introduction to PHP, advantages of PHP, PHP basics- operators and Flow Control, strings and arrays, creating functions.

**(7 Hrs)**

## **Unit V**

Objects, Web Techniques, HTTP Basics, Databases, Using PHP to access database, Client-server model.

**(4 Hrs)**

### **Books for Study:**

1. Bill Kennedy, Chuck Musciano, HTML: The Definitive Guide, 3rd Ed, O'Reilly Media
2. Flanagan David, JavaScript: The Definitive Guide, 6th Ed, O'Reilly Media
3. Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre, Programming PHP, 3rd Ed, O'Reilly Media

### **Books for Reference:**

1. Steven Holzner, PHP: The Complete Reference, 1st Ed, TMH
2. Dave W. Mercer, Allan Kent, Steven D. Nowicki, David Mercer, Dan Squier, Wanky Choi, Heow Eide-Goodman, Ed Lecky-Thompson, Clark Morgan, Beginning PHP5, Wrox
3. Thomas A. Powel, HTML & CSS: The Complete Reference, 5th Ed, TMH

### **Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 12           |
| 2           | 12           |
| 3           | 12           |
| 4           | 12           |
| 5           | 12           |

## CORE COURSE XVI: 5B16BCA-E01 INFORMATION SECURITY

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5B16BCA-E01 | 4              | 3      | 3        |

### COURSE OUTCOME

**CO1:** To understand the need of information security and to master information security Concepts, mechanisms and services as well as issues related to information Security.

**CO2:** To be familiar with cryptography and its categories.

**CO3:** Distinguish public and private key crypto systems and familiarize the rsa crypto System.

**CO4:** To attain the knowledge of digital signature and its security services.

#### **Unit I**

Introduction to Information Security- The need for Security, Principles of security - confidentiality, Authentications, Integrity, Non-repudiation. Types of attacks- Passive attacks, Active attacks, Virus, Worm, Trojan horse. Introduction to Cryptography, Steganography, Secret Sharing.

**(14 Hrs)**

#### **Unit II**

Traditional symmetric Key Ciphers: Introduction-Kirchhoff's principle, cryptanalysis, categories of traditional ciphers; Substitution Ciphers – mono alphabetic ciphers, polyalphabetic ciphers; Transposition Ciphers - keyless and keyed transposition ciphers, Stream and Block Ciphers - stream ciphers, block ciphers.

**(16 Hrs)**

#### **Unit III**

Introduction, DES Structure - initial and final permutations, rounds, cipher and reverse cipher, examples; DES Analysis - properties, design criteria, DES weaknesses; Multiple DES - double DES, triple DES; Security of DES - brute-force attack, differential cryptanalysis, linear cryptanalysis.

**(16 Hrs)**

#### **Unit IV**

Principles of Public Key Cryptosystems- Public Key Cryptosystem, Applications of Key Cryptosystems, Requirement for Public Key Cryptosystem, Public Key Cryptanalysis.

RSA Algorithm–Description of the Algorithm, Computational Aspects, Security of RSA.  
(13 Hrs)

**Unit V**

Comparison- inclusion, verification method, relationship, duplicity; Process- needs for keys, signing the digest; Service- message authentication, message integrity, nonrepudiation, confidentiality; Attacks on Digital Signature- attack types; Digital Signature Schemes- RSA digital signature schemes

(13 Hrs)

**Books for Study:**

1. Behrouz A. Forouzan and Debdeep Mukhopadhyay, Cryptography And Network Security, 3rd Ed, Mc Graw Hill (Units I, II, III, V)
2. William Stallings, Cryptography and Network Security - Principles and Practice Paperback, 7th Ed, Pearson(Unit IV)

**Books for Reference:**

1. Pieprzyk Josef, Hardjono Thomas and Seberry Jennifer, Fundamentals of Computer Security, Springer, 2003.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |

## CORE COURSE XVI: 5B16BCA-E02 MOBILE COMMUNICATIONS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5B16BCA-E02 | 4              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Understand GSM, CDMA concepts and architecture, frame structure, system capacity, services provided.

**CO2:** Understand about Wireless LAN

**CO3:** Understand about Mobile IP

#### **Unit I**

Introduction – history of wireless communication, A simplified reference model, frequencies for radio transmission, signals, Antennas, signal Propagation, Spread spectrum – DSSS and FHSS, Cellular systems.

**(16 Hrs)**

#### **Unit II**

SDMA, FDMA, TDMA and CDMA, GSM – Mobile services, system Architecture, Radio interface, Protocols, Localization and Calling, Handover, Security, GPRS.

**(14 Hrs)**

#### **Unit III**

Wireless LAN – infrared versus Radio transmission, IEEE 802.11 – system Architecture, Protocol architecture, Physical Layer, MAC Layer, MAC Management, 802.11b, 802.11a. Introduction to Bluetooth – IEEE802.15.

**(14 Hrs)**

#### **Unit IV**

Mobile IP – entities and Terminology, IP Packet delivery, Agent discovery, registration, tunneling, IPV6, Introduction to MANET, TCPover2.5/3G Wireless Networks.

**(14 Hrs)**

#### **Unit V**

WAP (1.x) – Architecture, Wireless Datagram Protocol, Wireless Transport Layer security. Wireless Transaction Protocol, wireless Session Protocol, wireless Application

Environment, wireless Markup Language, WML script, Introduction to WAP 2.0.

(14 Hrs)

**Books for Study:**

1. Jochen Schiller, Mobile Communications, 2nd Ed, Pearson

**Books for Reference:**

1. Roy Blake, Leo Chartrand, Wireless Communication Technology, 1st Ed, Delmar Cengage Learning
2. William C. Y. Lee, Mobile Communications Engineering: Theory and Applications, 2nd Ed, Mc Graw Hill
3. Kamilo Feher, Wireless Digital Communications: Modulation and Spread Spectrum Applications, Prentice Hall;
4. Vijay K. Garg and Joseph E. Wilkes, Principles and Applications of GSM, Pearson

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |



**CORE COURSE XVI: 5B16BCA-E03 C# AND .NET PROGRAMMING**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5B16BCA-E03 | 4              | 3      | 3        |

**COURSE OUTCOME**

**CO1:** To expose students to current trends and styles in programming

**CO2:** To familiarize simple, modern, general-purpose, object-oriented programming language.

**Unit I**

Introduction to C# - Evolution, Characteristics, applications. Understanding .NET- Origin of .NET Technology, .NET Framework, Common Language Runtime (CLR), .NET Approach. Overview of C#- Program Structure, A Simple C# Program, Namespaces, Command Line Argument, Errors.

**(16 Hrs)**

**Unit II:**

Basic concepts of Programming: Literals, Variables, Boxing and Unboxing, Data types, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

**(16 Hrs)**

**Unit III:**

Object Oriented aspects of C#, Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions, Multithreading.

**(16 Hrs)**

**Unit IV:**

Application Development on .NET Web Applications – Web form Fundamentals, Web form Events, Webform Life cycle, Creating a Web Application, Web Services. Windows Applications – Creating a Windows Application.

**(14 Hrs)**

**Unit V:**

Database Access and .NET Components Accessing Data with ADO.NET Assemblies,

Versioning, Attributes, Reflection, Viewing Meta Data, Type Discovery, Reflecting on a type, Marshalling, Remoting.

**(10 Hrs)**

**Books for Study:**

1. E. Balagurusamy, Programming in C#, 4th Ed, Mc Graw Hill
2. Jesse Liberty, Programming C#, 2nd Ed, O'Reilly Media

**Books for Reference:**

1. Jeff Ferguson, Brian Patterson, Jason Beres, Pierre Boutquin and Meeta Gupta, C# Bible, John Wiley & Sons
2. Jeff Prosise, Programming Microsoft .NET, Microsoft Press US
3. Kevin Hoffman, Jeffrey Hasan, Thiru Thangarathinam, Denise Gosnell, Jan Narkiewicz, Jeff Gabriel, John Schenken, Christian Holm, Scott Wylie, Jonothon Ortiz, Ed Musters and Professional .NET Framework, Wrox

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 15    |
| 2    | 15    |
| 3    | 15    |
| 4    | 10    |
| 5    | 5     |

## CORE COURSE XVI: 5B16BCA-E04 BIOINFORMATICS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5B16BCA-E04 | 4              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Understand Bioinformatics and biological databases.

**CO2:** Understand Concept of Biology

**CO3:** Understand Sequence alignment and Similarity search tools.

**CO4:** Structural bioinformatics and Bioinformatic tools

#### **Unit I**

**INTRODUCTION & BIOLOGICAL DATABASES:** Introduction to bioinformatics, Goal, Scope, Applications and Limitations; Introduction to Biological databases – databases and types of databases, biological databases – primary, secondary and specialized; Information retrieval from biological databases

**(16 Hrs)**

#### **Unit II**

**CELL BIOLOGY AND GENETICS:** Prokaryotes and Eukaryotes, Introduction to cell structure –Plant and animal cell, Introduction to DNA – Chemical nature of DNA, Central dogma of molecular biology

**(20 Hrs)**

#### **Unit III**

**SEQUENCE ALIGNMENT:** Pairwise sequence alignment – Global and local, Alignment algorithms – Dot matrix method, Dynamic programming method, Scoring matrices – PAM, BLOSUM, Statistical significance of Sequence alignment; Database Similarity Searching – BLAST, FASTA, Comparison of BLAST and FASTA, Statistical significance

**(20 Hrs)**

#### **Unit IV**

**STRUCTURAL BIOINFORMATICS & BIOINFORMATIC TOOLS:** Structure of protein – Amino acids, peptide formation, Structural forms of protein; Protein structure visualization – SwissPDB viewer, Pymol, Rasmol; Bioinformatic tools (EMBOSS package, Expasy)

**(16 Hrs)**

#### **Books for Study:**

1. Jin Xiong, Essential Bioinformatics Paperback, Cambridge University Press
2. Paul G. Higgs and Teresa K. Attwood, Bioinformatics and Molecular Evolution, Blackwell Publishing Ltd

#### **Books for Reference:**

1. P. S. Verma and V. K. Agarwal, Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, S.Chand
2. Andreas D. Baxevanis and B. F. Francis Ouellette, Bioinformatics: A Practical Guide To The Analysis Of Genes And Proteins

#### **Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| I           | 12           |
| II          | 18           |
| III         | 18           |
| IV          | 12           |

## CORE COURSE XVII: 6B17BCA DESIGN AND ANALYSIS OF ALGORITHM

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| VI       | 6B17BCA     | 4              | 4      | 3        |

### COURSE OUTCOME

**CO1:** Knowledge about important computational problems.

**CO2:** Knowledge to design the algorithm.

**CO3:** Knowledge to analyze a given algorithm.

**CO4:** Acquire knowledge to analyze algorithm control structures and solving recurrences.

#### **Unit I:**

Algorithm Design: Introduction, Steps in developing algorithm, Methods of specifying an algorithm, Decisions prior to designing based on the capabilities of the device, based on the nature of solutions, based on the most suitable data structures. Model of Computation: RAM model and PRAM model.

**(10 Hrs)**

#### **Unit II:**

Important Problem Types: Sorting, Searching, String matching, Graph problems, Combinatorial problems, Geometric problems, Numerical problems. Basic Technique for Design of Efficient Algorithm: Brute Force approach, Divide-and-Conquer approach, Greedy approach, Dynamic Programming, Backtracking, Branch-and-Bound technique.

**(20 Hrs)**

#### **Unit III:**

Algorithm Analysis: Importance of algorithm analysis, Time and Space Complexity. Growth of Functions: Asymptotic notations, Cost estimation based on key operations- big Oh, big Omega, little Oh, little Omega and Theta notations.

**(8 Hrs)**

#### **Unit IV:**

Analysing Algorithm Control Structures, Solving Recurrences: Substitution Method, Iteration Method, The Recursion Tree Method, Master's Theorem. Problem Solving using Master's Theorem Case 1, Case 2 and Case 3. Best case, worst case and average case performance analysis.

(20 Hrs)

**Unit V:**

Study of the structure of algorithms: Strasser's algorithm, Huffman coding, Kruskal's algorithm and Prim's algorithm.

(14 Hrs)

**Books for Study:**

1. Pallaw, V K, Design and Analysis of Algorithms, Asian Books Private Ltd, 2012, ISBN: 8184121687.
2. Pandey H M, Design and Analysis of Algorithms, University Science Press, 2013, ISBN: 9788131803349.

**Books for Reference:**

1. Upadhyay N, Design and Analysis of Algorithms, SK Kataria & Sons, 2008.
2. U. Manber, Introduction to Algorithms: A Creative Approach, Addison Wesley, ISBN: 9780201003277.
3. Gilles Brassard and Paul Bratley, Fundamentals of Algorithmics, Prentice-Hall of India, ISBN: 0133350681.
4. Goodman S E and Hedetniemi, Introduction to the Design and Analysis of Algorithms, Mcgraw Hill, ISBN: 0070237530.
5. Horowitz E and Sahni S, Fundamentals of Computer Algorithms, Galgotia Publications Pvt. Ltd, ISBN: 8175152575.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 8     |
| 2    | 13    |
| 3    | 13    |
| 4    | 13    |
| 5    | 13    |

## CORE COURSE XVII: 6B18BCA INTRODUCTION TO COMPILER

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| VI       | 6B18BCA     | 4              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Knowledge about Compiler

**CO2:** Knowledge about various phases of compiler design.

#### **Unit I:**

Introduction to compiling - definition of compiler, Classification of Compiler: Single pass, Multi pass, Load and Go. Parts of Compilation: Analysis and Synthesis. The phases of a compiler: Lexical Analyser, Syntax Analyser, Semantic Analyser, Intermediate code generator, Code optimizer, Target Program, Symbol table manager.

**(15 Hrs)**

#### **Unit II:**

Programming language basics - lexical analysis – role of lexical analyzer – input buffering - specification of tokens – recognition of tokens using finite automata.

**(15 Hrs)**

#### **Unit III:**

Syntax analysis – role of parser – error handling and recovery – definitions of parsing, top-down parsing and bottom-up parsing - context free grammars – derivations - parse tree – ambiguity – associativity and precedence of operators - writing a grammar.

**(12 Hrs)**

#### **Unit IV:**

Intermediate code generation – DAG – three address code – addresses and instructions – quadruples – triples – Static Simple Assignment form – types and declarations – type expressions - type equivalences – declarations – type checking – rules – type conversion.

**(15 Hrs)**

**Unit V:**

Run time environments – storage optimization – static Vs dynamic allocation – stack allocation of space - activation trees and records – calling sequences. Code generation – issues in the design of a code generator – the target language – a simple target machine model. Code optimization - the principal sources of optimization – data flow analysis – abstraction – data flow analysis schema – data flow schemas on basic blocks.

(15 Hrs)

**Books for Study:**

1. V Aho A, Ravi Sethi, D Ullman J, Compilers Principles, Techniques and Tools, 2<sup>nd</sup> Edition, Pearson Education Singapore Pte Ltd, ISBN: 8131721019.

**Books for Reference:**

1. Principles of Compiler Design by MG Durga and TG Manikumar. ISBN: 978-81-8094-161-0
2. W Appel and Andrew, Modern Compiler Implementation in C, 1st Edition, Cambridge University Press, ISBN: 817596071X.
3. Allen I Holub, Compiler Design in C, 1st Edition, PHI Learning Pvt Ltd, ISBN: 812030778X.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |



## CORE COURSE XIX: DATA COMMUNICATION & NETWORKS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| VI       | 6B19BCA     | 3              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Understand the basics of datacommunication

**CO2:** Familiarize with OSI referencemodel

**CO3:**Familiarize students with layers of communicationmodel

**CO4:** Understand the concepts of networksecurity

#### **Unit I**

Introduction to data communication, important elements /components of data communication, Data transmission- Analog, Digital. Transmission media- Guided media, Unguided media. Synchronous / Asynchronous data transmission. Line configuration – Simplex, Half duplex, Duplex. Network topologies – star, Bus, ring, Mesh. Computer networks, Use, network hardware, network structure- point to point connection, multicast, broadcast, classification of networks-LAN, WAN, Man. Network software – protocol hierarchies. design issues for layers, interfaces and services- connection oriented, connection less.

**(12 Hrs)**

#### **Unit II:**

Reference models, the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / IP models.Data Link Layer, Design issues, Services to network layer, Framing- character count, character stuffing, bit stuffing, physical layer coding violation. Error control, flow control, Elementary data link protocols- unrestricted simplexprotocol,simplexstopandwaitprotocol,simplexprotocolforanoisychannel.

**(12 Hrs)**

#### **Unit III:**

Network layer, design issues, services to the transport layer, routing algorithms- adaptive, non-adaptive algorithms, optimality principle, dijkstras shortest path routing algorithm, flow based routing, hierarchical routing, congestion control algorithms – the leaky bucket algorithm, the token bucketalgorithm.

**(10 Hrs)**

#### **Unit IV**

Transport layer, design issues, connection management-addressing, establishing and releasing connection, transport layer protocols- TCP,UDP

**(10 Hrs)**

#### **Unit V**

Application layer, network security, traditional cryptography, substitution ciphers, transposition ciphers, fundamental principles, secret key algorithm, data encryption standard, DES chaining, DES breaking. Public key algorithm, RSA algorithm.

**(10 Hrs)**

#### **Books for Study:**

1. Computer Networks, Andrew S. Tanenbaum & David J. Wetherall, Pearson.

#### **Books for Reference:**

1. Data Communication and Networking, Behrouz A. Forouzan, McGraw Hill Education.
2. Achyut S. Godbole and Atul Kahate, Data communication and Networks, 2<sup>nd</sup> Ed, Mc Graw Hill
3. Computer Networking: A Top-Down Approach, Kurose James F. and Ross Keith W., Pearson.
4. R. S. Rajesh, K. S. Easwara Kumar and R. Balasubramanian, Computer Networks – Fundamentals and Applications, Vikas Publishing House.

#### **Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 12           |
| 2           | 12           |
| 3           | 12           |
| 4           | 12           |
| 5           | 12           |

**CORE COURSE XX: 6B20BCA-E01 DATA MINING AND DATA WAREHOUSING**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| VI       | 6B20BCA-E01 | 3              | 3      | 3        |

**COURSE OUTCOME**

**CO1:** Understanding the importance of data mining and data warehousing.

**CO2:** Understand the data management aspects data preprocessing model and inference considerations, complexity considerations, post processing of discovered structures visualization and online updating

**Unit I**

Introduction; data warehousing – what is, Multidimensional data model, OLAP operations, warehouse schema, Data warehousing Architecture, warehouse server, Metadata, OLAP engine, data warehouse Backend Process.

**(12 Hrs)**

**Unit II**

Data mining – what is, KDD vs data mining, DBMS vs data mining, DM Techniques, issues and challenges, Applications. (Case studies) \*

**(8 Hrs)**

**Unit III**

Association rules – What is, Methods, a priori algorithm, partition algorithm, Pincer-search algorithm, FP-tree growth algorithm, incremental and Border algorithms, Generalized Association rule.

**(12 Hrs)**

**Unit IV**

Clustering techniques – Paradigms, Partitioning Algorithms, k – Medoid algorithms, CLARA, CLARANS, hierarchical clustering, DBSCAN, Categorical Clustering, STIRR.

**(10 Hrs)**

## **Unit V**

Decision trees – what is, tree construction principles, Best split, Splitting indices, Splitting criteria, decision tree construction algorithms, CART, ID3, C4.5, CHAID. Introduction to web, spatial and temporal datamining.

**(12 Hrs)**

### **Books for Study:**

1. Arun K. Pujari, Data Mining Techniques, 2nd Ed, Univeristy Press

### **Books for Reference:**

1. Jiawei Han, Micheline Kamber and Jian Pei, Data Mining: Concepts and Techniques, 3rd Ed, Morgan Kaufmann
2. Margaret H. Dunham, Data Mining - Introductory and Advanced Topics, Pearson

### **Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 12           |
| 2           | 12           |
| 3           | 12           |
| 4           | 12           |
| 5           | 12           |

**CORE XX: 6B20BCA-E02 NETWORK PROGRAMMING**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| VI       | 6B20BCA-E02 | 3              | 3      | 3        |

**COURSE OUTCOME**

**CO1:** Understand basics of network programming

**CO2:** Understand basics of socket options

**CO3:** Familiarize with DNS

**Unit I**

Introduction –A Simple Day Time Client – Protocol Independence – ErrorHandlingA Simple - Day Time Server.The Transport Layer: TCP, UDP – TCP Connection EstablishmentandTermination–TIME\_WAITState–PortNumbers– ConcurrentServersBuffer Size and Limitations – Standard Internet Services – Protocol Usage by Common InternetApplications.

**(15 Hrs)**

**Unit II**

Socket Introduction – Socket address Structures – Byte Ordering Functions – Byte Manipulation Functions – Elementary TCP Sockets – socket , connect, bind, listen, accept, fork and exec, close, getsockname and getpeername functions.

**(15 Hrs)**

**Unit III**

TCP Client/Server Example – TCP Echo Server - main(), str\_echo() – TCP Echo Client - main(), str\_cli() – startup – termination – Shutdown of ServerHost.

**(7 Hrs)**

**Unit IV**

Socket Options – getsockopt and setsockopt functions – Socket States –Generic Socket Options – TCP Socket Options.

**(7 Hrs)**

**Unit V**

Name and Address Conversions - DNS – gethostbyname – gethostbyaddr –

getservbyname – getservbyport – getaddrinfo – freeaddrinfo – host\_serv – tcp\_connect – tcp\_listen functions.

**(10 Hrs)**

**Books for Study:**

1. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, “Unix Network Programming The Sockets Networking API Volume I”, Pearson

**Books for Reference:**

1. Barry Nance, “Network Programming in C”, Prentice Hall

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |

## **CORE XX: 6B20BCA-E03DIGITAL IMAGE PROCESSING**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B20BCA-E03</b> | <b>3</b>                  | <b>3</b>      | <b>3</b>            |

### **COURSE OUTCOME**

**CO1:** Understand geometric transformations

**CO2:** Understand basic of morphological image processing

#### **Unit I:**

Images – DIP components – Problems and Applications – motivation and perceptive – Operations – Imaging – electronic camera – Human Eye – 3D imaging – Depth from triangulation , time-of-flight, interferometry, shading, tomography, Sampling – quantization, Color Image representation, Volumetricdata.

**(12 Hrs)**

#### **Unit II:**

Images in Java – java2D API – java advanced imaging – image manipulation – storage – reading and writing images – display – printing – pixel processing – gray level andcolor enhancement – mapping – image histogram – Histogram equalization – Colour processing.

**(12 Hrs)**

#### **Unit III:**

Neighborhood operations – convolutions and correlation – Linear and rank filteringEdge detection – Hybrid adaptive filters – frequency domain – spatial frequency –Fourier theory – DFT – investigating spectra – image filtering –deconvolution.

**(12 Hrs)**

#### **Unit IV:**

Geometric operation – simple techniques – Affine transformations – Algorithm – interpolation schemes – Wrapping and morphing – segmentation – thresholding – Contextual techniques.

**(12 Hrs)**

#### **Unit V:**

Morphological image processing – Basic concepts – operations – Morphological filtering – Morphological algorithms – Gray scale morphology – image compression. Redundancy – Performance characterization – Lossy and lossless compression techniques – compression of moving images.

**(6 Hrs)**

**Books for Study:**

1. Nick Efford , Digital Image Processing: A Practical Introduction using Java, Addison Wesley

**Books for Reference:**

1. Rafael C. Gonzalez and Richard E. Woods, Digital Image Processing, 4th Ed, Pearson
2. Jähne, Bernd, Digital Image Processing, Springer

**Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 12           |
| 2           | 12           |
| 3           | 12           |
| 4           | 12           |
| 5           | 12           |



## CORE COURSE XX: 6B20BCA-E04CLOUD COMPUTING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| VI       | 6B20BCA-E04 | 3              | 3      | 3        |

### COURSE OUTCOME

**CO1:** Understand fundamentals of cloud computing

**CO2:** Understand principles of parallel and distributed computing

**CO3:** Familiarize with Cloud Computing Architecture

#### **Unit I**

**Introduction:** Cloud Computing at a Glance - Historical Developments - Building Cloud Computing Environments - Computing Platforms and Technologies

**( 8Hrs)**

#### **Unit II**

**Principles of Parallel and Distributed Computing:** Eras of Computing - Parallel vs. Distributed Computing - Elements of Parallel Computing - Elements of Distributed Computing - Technologies for Distributed Computing

**(14 Hrs)**

#### **Unit III**

**Virtualization:** Introduction - Characteristics of virtualized environments - Taxonomy of virtualization techniques - Virtualization and cloud computing - Pros and Cons of Virtualization - Technology examples

**(12 Hrs)**

#### **Unit IV**

**Cloud Computing Architecture :** Introduction - The cloud reference model - Types of clouds - Economics of the cloud - Open challenges

**(10 Hrs)**

#### **Unit V**

**Cloud Platforms in Industry :** Amazon Web Services - Compute Services - Storage Services - Google AppEngine - Architecture and Core Concepts - Microsoft Azure - Azure Core Concepts.

**(10 Hrs)**

**Books for Study:**

1. Mastering Cloud Computing, Rajkumar Buyya, Christian Vecchiola,S. ThamaraiSelvi, Tata McGraw Hill Education Private Limited
2. Mastering Cloud Computing - Foundations and Applications Programming, Rajkumar Buyya, Christian Vecchiola and S. ThamaraiSelvi,MK Publications,

**Books for Reference:**

1. Cloud Computing: A Practical Approach, Anthony T .Velte, Toby J.Velte, Robert Elsenpeter, Tata McGraw Hill Edition, Fourth Reprint, 2010
2. Cloud Computing, Kumar Saurabh, WileyIndia.
3. Enterprise Cloud Computing Technology Architecture Applications, Gautam,Shroff

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 12    |
| 2    | 12    |
| 3    | 12    |
| 4    | 12    |
| 5    | 12    |

**CORE COURSE XXI: 6B21BCA LAB V: ENTERPRISE JAVA**

**PROGRAMMING**

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK           | CREDIT | EXAM<br>HRS |
|----------|-------------|-----------------------------|--------|-------------|
| VI       | 6B21BCA     | V SEM 3 HRS<br>VI SEM 2 HRS | 2      | 3           |

**COURSE OUTCOME**

**CO1:** Can write and execute simple JDBC Programs.

**CO2:** Can write and execute simple RMI Programs.

**CO3:** Can Write and execute simple servlet programs.

**CO4:** Can write and execute simple CORBA programs.

**Sample Program List**

A list of 10 Programs are given below. Each student has to complete and record all the exercises. A detailed problem statement shall be prepared by the faculty concerned.

1. JDBC program to insert, Delete and Update records into Employee table.
2. JDBC program to connect to Student table. Implement the record scrolling functions – first(), last(), next(), previous(), beforeFirst(), afterLast(), absolute() and relative().
3. JDBC program to display database metadata.
4. JDBC program to display Resultset metadata.
5. RMI program for Complex number operation.
6. RMI program for Bank operation.
7. Create an HTML form to read student details such as Roll, name, age, sex, qualification, percentage of marks etc. Write a servlet program that displays the same details.
8. Create an HTML form that reads a file name from the user. Write a servlet program that displays the contents of the file, specified by the user.
9. Session handling servlet that displays total number of visits to that page.
10. CORBA program for arithmetic operation.

## CORE COURSE XXII: 6B22BCALAB VI: PYTHON PROGRAMMING

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK           | CREDIT | EXAM<br>HRS |
|----------|-------------|-----------------------------|--------|-------------|
| VI       | 6B22BCA     | V SEM 3 HRS<br>VI SEM 2 HRS | 3      | 3           |

### COURSE OUTCOME

#### **Sample Program List**

1. Write a program to find the largest from a list of numbers
2. Write a program to generate first n perfect numbers
3. Write a program to perform the binary search
4. Write a program to find the square root of a number using bisection search method.
5. Write a program to generate Fibonacci series using recursion
6. Write a program to find the LCM and GCD of 2 numbers
7. Write a program to perform merge sort
8. Write a program which reads the contents of a file and copy the contents to another file after changing all the letter to upper case. Exceptions should be handled.
9. Write a program to find the prime numbers in a list of numbers.
10. Write a python program to perform the following
  - a) Create table students with fields name,sex,rollno,marks
  - b) Insert some rows into the table
  - c) Update the marks of all students by adding 2 marks
  - d) Delete a student with a given rollno
  - e) Display the details of a student with a given rollno
11. Create a simple Login window using Tkinter
12. Create a plot for the mathematical function  $x^2$ . The title of the plot and the axes should be labelled.

## **CORE COURSE XXIII: 6B23BCA LAB VII WEB TECHNOLOGY (LAB -VII)**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b>           | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|-------------------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B23BCA</b>     | <b>V SEM 2 HRS<br/>VI SEM 2 HRS</b> | <b>2</b>      | <b>3</b>            |

### **COURSE OUTCOME**

#### Guidelines

1. Follow standard coding method
2. The output of the program should be neatly formatted
3. Practice all the programs in the lab

### **Sample Program list**

1. Develop an HTML page using all basic tags
2. Develop an HTML page to display hotel menu using all types of lists
3. Write an HTML code to insert an image into the web page. Use the attributes height, width and border. Also align some text with respect to the images. The image should have an ALT text in it.
4. Design a HTML page for the following.
  - a. Set an image as a link
  - b. Open a link in a new browser window
  - c. Jump to another part of a document (on same page)
5. Create a web page to display the maximum and minimum temperature of 5 cities using table.
6. Create a web page for your college using frames, images and hyperlink
7. Create a web page that illustrate the onMouseOver and onMouseOut event handlers.
8. Form Validation using Javascript.
9. Create an email registration form. Give necessary validations
10. Write a JavaScript code using arrays
11. Develop an HTML page that accepts any mathematical expression, evaluates that expression and display the result of the evaluation

12. Write a Javascript program to display the current time
13. Write a Javascript program to print the prime numbers within a range
14. Write a Javascript program to show the working of alert ()
15. Write a JavaScript program to find the factorial of a number.
16. Form Processing using PHP
17. Form validation using PHP
18. Storing data in MYSQL using PHP

**CORE COURSE XXIV: 6B24BCA PROJECT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B24BCA</b>     | <b>5</b>                  | <b>4</b>      | <b>3</b>            |

# **Model Question Papers**



**Model Question Paper-1**  
**5B14BCAPython Programming**

**Time: 3 Hours**

**Max. Marks: 40**

**Part A: Short Answer**

**Answer all questions**

**(6 x 1 = 6 Marks)**

1. Give syntax for function definition in python.
2. What are built-in attribute methods.
3. What is the purpose of zeros function in numpy module?
4. Explain the use of linspace function in numpy with an example?
5. What is meant by widget in Tkinter?
6. Give syntax for connecting to a database in python.

**Part B: Short Essay**

**Answer any 6 questions**

**(6 x 2 = 12 Marks)**

7. What are the different methods to run python?
8. What is the difference between mutable and immutable objects in python?
9. How a module can be created? Give an example.
10. Write a recursive function in python to find the n<sup>th</sup> Fibonacci number and use it to generate a Fibonacci series of required numbers.
11. Explain about built-in exceptions in python.
12. How a class is defined? Explain with an example.
13. Explain 2 different methods for changing the shape of an array.
14. Explain about message widget.

**Part C: Essay**

**Answer any 4 questions**

**(4 x 3 = 12 Marks)**

15. Explain about sets in python.
16. Explain about branching statements in python.
17. How python can be used to write in to a file? Explain with an example.
18. Explain how operator overloading can be done in python with an example.
19. Explain how transaction control can be done in python.
20. Explain about pack layout manger.

**Part D: Long Essay**

**Answer any 2 questions**

**(2 x 5 = 10 Marks)**

21. Explain in detail about lists and dictionaries in python.
22. Explain about exception handling in python.
23. What are the object-oriented programming features of python?
24. Explain about 5 widgets in Tkinter.

**Model Question Paper-2**  
**3B07BCA JAVA PROGRAMMING**

**Time: 3 Hours**

**Max. Marks: 40**

**Section A**

**Answer All the questions (6 x 1 = 6 marks)**

1. What is a token?
2. What is platform independancy?
3. What do you mean by method?
4. What is the use of t'his' keyword?
5. What are threads?
6. What is GUI?

**SECTION B**

**Write short notes on ANY SIX of the following questions(6 x 2 = 12 marks)**

7. How to create and use an one dimensional array in Java?
8. Define an applet.
9. Syntax of try \_\_\_\_ catch statement with multiple catch.
10. Short note on thread groups.
11. Explain APPLET tag.
12. Write about any two methods of button class.
13. Short note on StringBuffer class
14. Explain any two string operations in Java

**SECTION C**

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

15. Write a Java program to illustrate applet lifecycle.
16. Short note on Thread Priorities in Java.
17. Write an overview of filter streams in Java.
18. What do you mean by event listeners in Java?
19. What is thread synchronization. Explain.
20. Explain exception handling in Java.

**SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

21. Write a program to handle exceptions with multiple catch block.
22. Explain the AWT controls.
23. With suitable example, explain packages in java.
24. Write a Java program to create a thread by extending thread class.

**Model Question Paper-3**  
**4B08BCA OPERATING SYSTEMS**

**Time: 3 Hours**

**Max. Marks: 40**

**SECTION A**

**Answer ALL Questions**

**(6 x 1=6)**

1. Define OS
2. List out different process states
3. Mention different process scheduling criteria's
4. What is internal fragmentation
5. What is rotational latency
6. List out different types of files

**SECTION B**

**Answer ANY SIX of the following Questions(6 x 2=12)**

7. What are the functions of an OS?
8. Write a short note on microkernels
9. Write a short note on PCB
10. Mention about conditions for deadlocks
11. Differentiate between paging and segmentation
12. Write a short note on overlays
13. What is seek time
14. Write a short note on file attributes

**SECTION C**

**Write an essay on ANY FOUR of the following Questions(4 x 3=12)**

15. With example explain system calls
16. Explain IPC
17. With example explain LRU page replacement algorithm
18. Explain segmentation
19. Explain about RAID
20. with example explain Access matrix

**SECTION D**

**Write Long essay on ANY TWO of the following Questions (2 x 5=10)**

21. OS is a resource manager. Explain
22. Explain the techniques for handling deadlocks
23. Explain any 4 disk scheduling algorithms in detail
24. Explain different directory structures

**Model Question Paper-4**  
**5B13BCA ENTERPRISE JAVA PROGRAMMING**

**Time: 3 Hours**

**Max. Marks: 40**

**SECTION A**

**Answer All the questions (6 x 1 = 6 marks)**

1. What is IDL?
2. What is RMI?
3. What are the packages used in a servlet API?
4. How can you load or register the driver in JDBC?
5. List the different init() functions in ORB.
6. Explain the JDBC URL.

**SECTION B**

**Write short notes on ANY SIX of the following questions (6 x 2 = 12 marks)**

7. What is SQL exception?
8. How can you create data members and methods in IDL?
9. What are cookies?
10. What is CORBA?
11. Explain servlet lifecycle.
12. What are RMI stubs and skeletons?
13. What are BLOB and CLOB?
14. How can you configure clients and servers for remote class loading.

**SECTION C**

**Answer ANY FOUR of the following questions (4 x 3 = 12 marks)**

15. Write short note on different kinds of statements in JDBC.
16. Describe Java classes generated in an IDL interface.
17. What is a CORBA naming service?
18. With suitable examples explain DatabaseMetaData and ResultSetMetaData.
19. Describe session tracking in servlet.
20. Explain error handling in servlets.

**SECTION D**

**Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)**

21. Explain the JDBC architecture with a sample program.
22. Describe the elements of the Servlet API.
23. Explain the RMI architecture, with a diagram.
24. Explain the CORBA architecture.

## **PART B**

### **BCA GENERIC ELECTIVE COURSES** **WORK AND CREDIT DISTRIBUTION** **(2019 ADMISSION ONWARDS)**

STUDENTS OF OTHER DEPARTMENTS CAN CHOOSE ANY ONE OF THE  
GENERIC ELECTIVE COURSES FROM THE POOL OF FIVE COURSES.

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                       | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> | <b>MARKS (INTERNAL + EXTERNAL)</b> |
|--------------------|-------------------------------------------|-----------------|-----------------------|---------------|-------------------|------------------------------------|
| 5D01BCA            | PROGRAMMING WITH C                        | 5               | 2                     | 2             | 2                 | 5+20                               |
| 5D02BCA            | WEB TECHNOLOGY                            | 5               | 2                     | 2             | 2                 | 5+20                               |
| 5D03BCA            | DATABASE MANAGEMENT SYSTEM                | 5               | 2                     | 2             | 2                 | 5+20                               |
| 5D04BCA            | CYBER LAW                                 | 5               | 2                     | 2             | 2                 | 5+20                               |
| 5D05BCA            | FUNDAMENTALS OF COMPUTERS AND PROGRAMMING | 5               | 2                     | 2             | 2                 | 5+20                               |

### **EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> |
|-------------------|------------------|
| EXTERNAL          | 4                |
| INTERNAL          | 1                |

### **CONTINUOUS INTERNAL ASSESSMENT FOR THEORY**

| <b>COMPONENT</b>                            | <b>WEIGHTAGE</b> | <b>REMARKS</b>                                                                                                                                                  |
|---------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COMPONENT 1:<br>TEST                        | 80%              | MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE BEST TWO MARKS OBTAINED IN THE TESTS CONDUCTED. |
| COMPONENT 2:<br>ASSIGNMENT/<br>SEMINAR/VIVA | 20%              | ANY ONE COMPONENT                                                                                                                                               |

**PATTERN OF QUESTION PAPER FOR END SEMESTER ASSESSMENT**

|                                         |                        |                                         |
|-----------------------------------------|------------------------|-----------------------------------------|
| <b>Part A</b>                           | <b>Short Answer</b>    | <b>6 Questions x 1 Mark = 6 Marks</b>   |
|                                         | Answer all questions   | 6 Questions x 1 Mark = 6 Marks          |
| <b>Part B</b>                           | <b>Short Essay</b>     | <b>6 Questions x 2 Marks = 12 Marks</b> |
|                                         | Answer any 4 questions | 4 Questions x 2 Marks = 8 Marks         |
| <b>Part C</b>                           | <b>Essay</b>           | <b>2 Questions x 6 Marks = 12 Marks</b> |
|                                         | Answer any 3 questions | 1 Question x 6 Marks = 6 Marks          |
| <b>Total Marks Including Choice: 30</b> |                        |                                         |
| <b>Maximum Marks for the Course: 20</b> |                        |                                         |

**GENERIC ELECTIVE COURSE: 5D01BCA PROGRAMMING WITH C**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D01BCA</b>     | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**COURSE OUTCOME**

*CO1: Understanding the basic concepts in programming.*

*CO2: Familiarize the basic syntax and semantics of C language.*

*CO3: Familiarize with advanced features of C*

*CO4: Develop skill in programming*

**Unit I**

The C character set, Identifiers and keywords, Classes of Data Types, constants, variable declarations. Expressions, statements, operators and expressions: arithmetic operators, unary operators, relational operator, logical operators, assignment operator, the conditional operator. Library functions: data input and output functions like getchar(), putchar(), scanf(), printf(), gets and puts.

**(10 Hrs)Unit II**

Control statements: Branching: The if-else statements. Looping: The while, do-while and for loops. The switch statements, Break and continue, comma operator.

**(8 Hrs)**

**Unit III**

Functions, defining a function, accessing a function, function prototype, passing arguments to a function, Returning from a function, recursion, program structure. Storage classes: automatic, static, register and extern(global).

**(8 Hrs)**

**Unit IV**

Arrays, Structure and Union: Defining an array, processing an array, passing arrays to functions, multidimensional arrays. Structure and union. Defining a structure, processing a structure. Union.

**(5 Hrs)**

**Unit V:**

Strings: Basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat&strrev.

(5 Hrs)

**Books for Study:**

1. E. Balaguruswamy, Programming in ANSI C, 7th Ed, TMH

**Books for Reference:**

1. V. Rajaraman, Computer Basics and C Programming, PHI
2. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearson
3. Yeshavant Kanetkar, Let Us C, 16<sup>th</sup> Ed, BPB
4. Noel Kalicharan, C by Example, Cambridge University Pres

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 6     |
| 2    | 6     |
| 3    | 6     |
| 4    | 6     |
| 5    | 6     |



**GENERIC ELECTIVE COURSE: 5D02BCA WEB TECHNOLOGY**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D02BCA</b>     | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**COURSE OUTCOME**

*CO1: Enable students to program for the World Wide Web using HTML, JavaScript.*

*CO2: Create static and dynamic web pages.*

*CO3: Impart basic knowledge in Client-server model.*

**UNIT I**

Introduction to Internet and WWW, Introduction to HTML, structure of HTML, HTML elements, attributes, syntax of tags , starting and ending tags, physical style tags, listing, labeling, grouping, images and linking

**(6 Hrs)**

**UNIT II**

HTML Tables-tags-<tr>,<td>,<th> attributes. HTML Form-tag, attributes-type-passwd, submit, radio, check, method, action.

**(8Hrs)**

**UNIT III**

Frames-<frame>, <frameset>, <iframe>,<noframe> and other important tags and attributes. Simple programs using frames.

**(6 Hrs)**

**UNIT IV**

Javascript- Introduction, data types, variables, operators, functions, objects, arrays. Client-side object hierarchy and document object Model, <script>, event handlers, javascript in urls.

**(8Hrs)**

**UNIT V**

Windows and frames-dialog boxes, status line, navigator object, opening Windows, closing windows, Location object, history object.- Date object- math object- Accessing form object

**(8Hrs)**

**Books for Study:**

1. Bill Kennedy, Chuck Musciano, HTML: The Definitive Guide, 3rd Ed, O'Reilly Media
2. Flanagan David, JavaScript: The Definitive Guide, 6th Ed, O'Reilly Media

**Books for Reference:**

1. Thomas A. Powel, HTML & CSS: The Complete Reference, 5th Ed, TMH

**Marks including choice:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| 1           | 6            |
| 2           | 6            |
| 3           | 6            |
| 4           | 6            |
| 5           | 6            |

**GENERIC ELECTIVE COURSE: 5D03BCA DATABASE MANAGEMENT SYSTEM**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>V</b>        | <b>5D03BCA</b>     | <b>2</b>              | <b>2</b>      | <b>2</b>        |

**COURSE OUTCOME**

**CO1:** To understand the fundamentals of database management system

**CO2:** To develop Skill in designing database

**CO3:** To understand the concept of SQL commands

**CO4:** To develop Skill in writing queries

**Unit I**

Introduction–Field,Record,Entity,Attribute,Relation,Domain,Tuple-advantages of database systems- data models (Network model, Hierarchical Model, DBTG CODASYL model, Relational Model(E-R)) - system structure.

**(8 Hrs)**

**Unit II:**

Database administrator- data base users, Constraints (Primary, Foreign, Candidate, Unique)- Relational Algebra (Union, Intersection, Difference, Product, Project, Selection).

**(8 Hrs)**

**Unit III:**

SQL: Introduction to SQL, database languages, DDL(create, alter, Drop), DML(Insert into, Select, update, Delete) and DCL commands. Data Types in SQL

**(8 Hrs)**

**Unit IV:**

SQL Functions(Different Types of Functions), Operators (Arithmetic, Relational, Logical), Sub Quires (in Detail), Clauses (Having, Group By)

**(6 Hrs)**

**Unit V:**

Joins(Different Types of Join Statements), View, Introduction to Sequence

**(6 Hrs)**

**Books for Study:**

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database System Concepts, 6th Ed, TMH
2. Narain Gehani, The Database Book Principles and Practice Using MySQL, University Press

**Books for Reference:**

1. Elmasri Ramez and Navathe Shamkant, Fundamentals of Database System, 7th Ed, Pearson

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 6     |
| 2    | 6     |
| 3    | 6     |
| 4    | 6     |
| 5    | 6     |

**GENERIC ELECTIVE COURSE: 5D04BCA CYBER LAW**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D04BCA</b>     | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**CO1:** To understand the fundamentals of cyber law

**CO2:** To know about different types of cyber crimes

**CO3:** To understand about Intellectual Property Rights

**UNIT I**

Fundamentals of Cyber Law: Jurisprudence of Cyber Law- Overview of Computer and Web Technology- Introduction to Indian Cyber Law- Overview of General Laws and Procedures in India; Freedom of Expression on the Internet.

**(8 Hrs)**

**UNIT II**

Cyber Crimes: Meaning of Cyber Crimes –Cybercrimes under IPC, Cr.P.C and Indian Evidence Law

**(8 Hrs)**

**UNIT III**

Cybercrimes under the Information Technology Act,2000 - Cybercrimes under International Law

**(8 Hrs)**

**UNIT IV**

Hacking Child Pornography, Cyber Stalking, Denial of service Attack, Virus Dissemination, Software Piracy, Internet Relay Chat (IRC) Crime, Credit Card Fraud, Net Extortion, Phishing etc

**(8 Hrs)**

**UNIT V**

Intellectual Property Issues and Cyberspace: The Indian Perspective; Overview of Intellectual Property related Legislation-Copyright law & Cyberspace.

**(4 Hrs)**

**Books for Study:**

1. Information Technology law and Practice, Sharma,Vakul , Universal law Publishing, 2011
2. Cyber law, Rattan, Jyoti. New Delhi: Bharat law House,2011.

**Books for Reference:**

1. Guide to Cyber Laws, Rodney D. Ryder, 2nd Edit, Wadhwa and Company, NagpurSeth,Kanika.
2. Cyber Law in the Information Technology Act. Nagpur : Lexis Nexis Butterworth Wadhwa,2009
3. Guide of Cyber Law , Rodney D.Ryder,2nd Edition.
4. Cyber Law , Faruq Ahmed, in India.

**Marks including choice:**

| Unit | Marks |
|------|-------|
| 1    | 6     |
| 2    | 6     |
| 3    | 6     |
| 4    | 6     |
| 5    | 6     |

**GENERIC ELECTIVE COURSE: 5D05BCA FUNDAMENTALS OF  
COMPUTERS AND PROGRAMMING**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>5</b>        | <b>5D05BCA</b>     | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**COURSE OUTCOME**

- CO1:** To know the working principle of a computer  
**CO2:** To understand the concept of number system  
**CO3:** To understand the basics of computer network  
**CO4:** To understand the basics of programming

**Unit I:**

Introduction to Computers: Characteristics, Generation, Basic operations of a computer system: Inputting, storing, processing, outputting and controlling, CPU, ALU, Control Unit, Main Memory Unit, Secondary storage devices: tape, floppy, hard disk, CD, DVD.

**(12Hrs)**

**Unit II:**

Representation of information: Number system: binary, octal and hexadecimal system, Conversion: decimal to binary, decimal to octal, decimal to hexadecimal, binary to decimal, octal to decimal and hexadecimal to decimal, Different code used: BCD, ASCII, EBCDIC, and GRAY Code.

**(8Hrs)**

**Unit III:**

Introduction to Computer networking: Goals, Transmission modes: simplex, half duplex and full duplex, Classification of networks: LAN, MAN and WAN, Topologies: bus, star, ring, and mesh.

**(8 Hrs)**

**Unit IV:**

Computer Programming: Introduction, algorithm, flowchart, characteristics of a good program. Programming languages: machine, assembly and high-level languages, Assembler, Compiler and Interpreter. Source code and object code.

**(8Hrs)**

**Books for Study:**

1. Computer Fundamentals, Pradeep.K. Sinha &Priti Sinha, BPB Pub
2. Introduction to Information Technology, V. Rajaraman, Prentice Hal
3. Computer Networks 3rd Edn, A S Tanenbaum . Pearson Pub

**Books for Reference:**

1. Peter Norton, Introduction to Computers,6e, (Indian Adapted Edition)
2. B Forouzan, Introduction to data communication and networking

**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 9     |
| II   | 6     |
| III  | 8     |
| IV   | 7     |



# **Model Question Papers**

# GENERIC ELECTIVE COURSE FOR SEMESTER V

## Model Question Paper-1 5D04BCACYBER LAW

Time: 2 Hours

Max. Marks: 20

### Part A

**Answer all questions**

*(6 questions x Mark 1each = 6)*

1. Freedom of expression is a very important value in our society, but the right to express yourself or give your opinion about a person has its limits.(True/False)
2. ----- is created inciting a religious group to act or pass objectionable remarks against a country, national figures etc.
3. -----are the **crimes** which are committed with the use of any electronic system, network or device.
4. Section ----- of the Indian Penal Code is dealing with stalking.
5. Which protocol is a service that allows people to chat with each other online?
6. What is patent infringement?

### Part B

**Answer any 4 questions**

*(4 questions x Marks 2 each=8)*

7. Comment on 'Cyber Law'
8. Describe Indian Evidence Law in detail.
9. Under the Cybercrimes of International Law what are Content-related offences?
10. Explain Credit Card Fraud, Net Extortion.
11. Write notes on Software Piracy.
12. Explain the role of Cyber Law in 'Intellectual Property'

### Part C

**Answer any 1 questions**

*( 1 questions x Marks 6 each=6)*

13. Discuss any six cybercrimes by giving the section, particulars and punishment for the offence.
14. Explain at least two reasons for establishing the patent system



KANNUR UNIVERSITY  
(Abstract)

B.Com Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

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ACADEMIC BRANCH

No.Acad.C1/12281/2019

Dated, Civil Station P.O.,20.06.2019

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- Read:-
1. U.O.No.Acad.C2/429/2017 dated.10-10-2017
  2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
  3. U.O.No.Acad.C2/429/2017 Vol.II dated.03-06-2019.
  4. The Minutes of the Meeting of the Board of Studies in Commerce (UG) held on 07.06.2019
  5. Syllabus of B.Com.Programme, submitted by the Chairperson, Board of Studies in Commerce (UG), dated 12.06.2019

**ORDER**

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2.The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed different phases of Syllabus Revision processes such as conducting the meetings of various Boards of Studies and Workshops, discussions etc.

3.The Revised Regulations for UG programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) were implemented with effect from 2019 Admission as per paper read (3) above.

P.T.O

4.As per paper read (4) above, the Board of Studies in Commerce (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Com Programme to be implemented with effect from 2019 Admission.

5.As per paper read (5) above, the Chairperson, Board of Studies in Commerce (UG) has submitted the final copy of the Scheme, Syllabus & Pattern of Question Papers of B. Com Programme for implementation with effect from 2019 Admission.

6.The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(i) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) for B.Com programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting before the Academic Council.

7.The Scheme, Syllabus & Pattern of Question Paper of B.Com.Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

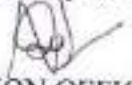
Sd/-  
DEPUTY REGISTRAR(ACADEMIC)  
for REGISTRAR

To  
The Principals of Colleges offering B.Com Programme

- Copy to:-
1. The Examination Branch (through PA to CE)
  2. The Chairperson, Board of Studies in Commerce (UG)
  3. PS to VC/PA to PVC/PA to Registrar
  4. DR/AR-I, Academic
  5. The Computer Programmer(for uploading in the website)
  6. SF/DF/FC



Forwarded/By Order

  
SECTION OFFICER



**KANNUR UNIVERSITY**

**BOARD OF STUDIES, COMMERCE (UG)**

**SYLLABUS FOR  
CORE COURSES, GENERAL AWARENESS COURSES,  
COMPLEMENTARY ELECTIVE COURSES  
FOR B.COM DEGREE PROGRAMME  
AND GENERIC ELECTIVE COURSES**

**CHOICE BASED CREDIT SEMESTER SYSTEM**

**(2019 ADMISSION ONWARDS)**

## **KANNUR UNIVERSITY**

### **VISION AND MISSION**

**Vision:** To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

**Mission:**

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

# KANNUR UNIVERSITY

## PROGRAMME OUTCOMES (PO)

### **PO 1.Critical Thinking:**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

### **PO 2.Effective Citizenship:**

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

### **PO 3.Effective Communication:**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

### **PO 4.Interdisciplinarity:**

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

## **INTRODUCTION**

The Board of Studies of Commerce (UG) as per the direction of Kannur University has decided to introduce outcome based course syllabus for the undergraduate Programme in commerce with effect from the academic year 2019-20. The process of revising and restructuring the syllabus was undertaken in compliance with the national education policy of the University Grants Commission, the directions of the Kerala State Higher Education Council and Kannur University. This revised syllabus is the result of a series of meetings of the board of studies and workshop of college teachers conducted for this purpose. Suggestions and recommendations of scholars, teachers, students and other eminent persons in the area of commerce were taken in to consideration while drafting the new syllabus. Due care has been taken to make the new curriculum up to date, pertinent for the current scenario and in tune with the industrial requirements

I express my sincere gratitude to all members of the Board of Studies of commerce (UG), all scholars and faculty members who helped to fulfill this task.

Dr. RAJESH KUMAR .E. R  
CHAIRMAN  
Board of Studies, Commerce (UG)



**KANNUR UNIVERSITY**

**PROGRAMME SPECIFIC OUTCOME OF B.COM DEGREE**

**After the successful completion of the B.Com Degree Programme, the students shall be able to;**

**PSO 1:**

**Understand the concepts and techniques of commerce and its application in business environment**

**PSO 2:**

**Conceive the ideas on entrepreneurship and develop the skills for setting up and management of business organizations**

**PSO 3:**

**Develop the skills and abilities to become competent and competitive in the business world**

**PSO 4:**

**Develop the competency to take wise decisions at personal and professional level**

**PSO 5:**

**Appraise the impact of other disciplines on the working of business**

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**KANNUR UNIVERSITY**  
**B.COM DEGREE PROGRAMME**

**COURSE AND CREDIT DISTRIBUTION STATEMENT**

| <b>Courses</b>                         | <b>No of Courses</b> |           | <b>Credit</b> |            |
|----------------------------------------|----------------------|-----------|---------------|------------|
| English Common Course (ECC)            |                      | 4         |               | 14         |
| Additional Common Course (ACC)         |                      | 2         |               | 8          |
| Core Courses:                          |                      |           |               |            |
| Discipline Specific Core Course (DSCC) | 13                   | 17        | 48            | 64         |
| Discipline Elective Core Course (DECC) | 4                    |           | 16            |            |
| General Awareness Course (GAC)         |                      | 4         |               | 16         |
| Complimentary Elective Course (CEC)    |                      | 4         |               | 16         |
| Generic Elective Course (GEC)          |                      | 1         |               | 2          |
| <b>Total</b>                           |                      | <b>32</b> |               | <b>120</b> |

**WORK AND CREDIT DISTRIBUTION STATEMENT**

| <b>Semester</b> | <b>Course Title</b>                                       | <b>Type of Course</b> | <b>Credits</b> | <b>Hours per week</b> |
|-----------------|-----------------------------------------------------------|-----------------------|----------------|-----------------------|
| <b>I</b>        | English Common Course I                                   | ECC                   | 4              | 5                     |
|                 | English Common Course II                                  | ECC                   | 3              | 4                     |
|                 | Additional Common Course I                                | ACC                   | 4              | 5                     |
|                 | Management Concepts and Principles (1B01 COM)             | DSCC                  | 4              | 5                     |
|                 | Business Statistics and Basic Numerical Skills(1A11 COM)  | GAC                   | 4              | 6                     |
|                 | <b>TOTAL</b>                                              |                       |                | <b>19</b>             |
| <b>II</b>       | English Common Course III                                 | ECC                   | 4              | 5                     |
|                 | English Common Course IV                                  | ECC                   | 3              | 4                     |
|                 | Additional Common Course II                               | ACC                   | 4              | 5                     |
|                 | Functional Applications of Management (2B02 COM)          | DSCC                  | 4              | 5                     |
|                 | Quantitative Techniques for Business Decisions (2C01 COM) | CEC                   | 4              | 6                     |
|                 | <b>TOTAL</b>                                              |                       |                | <b>19</b>             |
| <b>III</b>      | Entrepreneurship development (3A12 COM)                   | GAC                   | 4              | 5                     |
|                 | Advanced Accounting (3B03 COM)                            | DSCC                  | 4              | 6                     |
|                 | Course I from Elective Stream I/II/III/IV (3B04 COM)      | DECC                  | 4              | 5                     |
|                 | Business Regulatory Framework (3C02 COM)                  | CEC                   | 4              | 4                     |
|                 | Business Economics (3C03 COM)                             | CEC                   | 4              | 5                     |
|                 | <b>TOTAL</b>                                              |                       |                | <b>20</b>             |

| Semester | Course Title                                             | Type of Course | Credits   | Hours per week |
|----------|----------------------------------------------------------|----------------|-----------|----------------|
| IV       | General Informatics Skills (T+P)<br>(4A13 COM)           | GAC            | 4(3+1)    | 5(3+2)         |
|          | Environmental Studies and Disaster Management (4A14 COM) | GAC            | 4         | 5              |
|          | Corporate Accounting (4B05 COM)                          | DSCC           | 4         | 6              |
|          | Course II from Elective Stream I/II/III/IV (4B06 COM)    | DECC           | 4         | 5              |
|          | Corporate Law and Business Regulations (4C04 COM)        | CEC            | 4         | 4              |
|          | <b>TOTAL</b>                                             |                | <b>20</b> | <b>25</b>      |
| V        | Business Research Methodology (5B07 COM)                 | DSCC           | 3         | 4              |
|          | Income Tax law and Practice (5B08 COM)                   | DSCC           | 4         | 5              |
|          | Cost Accounting (5B09 COM)                               | DSCC           | 4         | 5              |
|          | Banking Principles and Operations (5B10 COM)             | DSCC           | 4         | 5              |
|          | Course III from Elective Stream I/II/III/IV (5B11 COM)   | DECC           | 4         | 4              |
|          | Generic Elective Course (5D-- COM)                       | GEC            | 2         | 2              |
|          | <b>TOTAL</b>                                             |                | <b>21</b> | <b>25</b>      |
| VI       | Financial Markets and Services (6B12 COM)                | DSCC           | 3         | 4              |
|          | Management Accounting (6B13 COM)                         | DSCC           | 4         | 5              |
|          | Auditing and Corporate Governance (6B14 COM)             | DSCC           | 4         | 5              |
|          | Income Tax and GST (6B15 COM)                            | DSCC           | 4         | 5              |
|          | Course IV from Elective Stream I/II/III/IV (6B16 COM)    | DECC           | 4         | 4              |
|          | Project (6B17 COM)                                       | DSCC           | 2         | 2              |
|          | <b>TOTAL</b>                                             |                | <b>21</b> | <b>25</b>      |

### Industrial Visit

The forth/fifth semester students of regular colleges shall be taken under the supervision of faculty members to business or industrial units so as to enable them to have a direct knowledge about location, layout, managerial function, HR management or any area of

study. The study tour to an industrial/business unit will form a part of the curriculum. The report submitted by the students in this respect shall be considered as one of the assignment of any one course in the concerned semester.

**PART A:**

**B.COM CORE COURSES**

**WORK AND CREDIT DISTRIBUTION**

**( 2019 ADMISSION ONWARDS )**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                   | <b>SEMESTER</b> | <b>HOURS/<br/>WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|--------------------|---------------------------------------|-----------------|------------------------|---------------|---------------------|
| 1B01<br>COM        | Management Concepts and Principles    | I               | 5                      | 4             | 3                   |
| 2B02<br>COM        | Functional Applications of Management | II              | 5                      | 4             | 3                   |
| 3B03<br>COM        | Advanced Accounting                   | III             | 6                      | 4             | 3                   |
| 3B04<br>COM        | Elective Course I                     | III             | 5                      | 4             | 3                   |
| 4B05<br>COM        | Corporate Accounting                  | IV              | 6                      | 4             | 3                   |
| 4B06<br>COM        | Elective Course II                    | IV              | 5                      | 4             | 3                   |
| 5B07<br>COM        | Business Research Methodology         | V               | 4                      | 3             | 3                   |
| 5B08<br>COM        | Income Tax law and Practice           | V               | 5                      | 4             | 3                   |
| 5B09<br>COM        | Cost Accounting                       | V               | 5                      | 4             | 3                   |
| 5B10<br>COM        | Banking Principles and Operations     | V               | 5                      | 4             | 3                   |
| 5B11<br>COM        | Elective Course III                   | V               | 4                      | 4             | 3                   |
| 6B12<br>COM        | Financial Markets and Services        | VI              | 4                      | 3             | 3                   |
| 6B13<br>COM        | Management Accounting                 | VI              | 5                      | 4             | 3                   |
| 6B14<br>COM        | Auditing and Corporate Governance     | VI              | 5                      | 4             | 3                   |
| 6B15<br>COM        | Income Tax and GST                    | VI              | 5                      | 4             | 3                   |
| 6B16<br>COM        | Elective Course IV                    | VI              | 4                      | 4             | 3                   |
| 6B17<br>COM        | Project                               | VI              | 2                      | 2             | -                   |

## ELECTIVE STREAMS

### I - CO-OPERATION

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                      | <b>SEMESTER</b> | <b>HOURS/ WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|------------------------------------------|-----------------|--------------------|---------------|-----------------|
| 3B04<br>COM        | Co-operative Principles                  | III             | 5                  | 4             | 3               |
| 4B06<br>COM        | Management of Co-operatives              | IV              | 5                  | 4             | 3               |
| 5B11<br>COM        | Co-operative laws                        | V               | 4                  | 4             | 3               |
| 6B16<br>COM        | Co-operative Accounting and Legislations | VI              | 4                  | 4             | 3               |

### II - COMPUTER APPLICATION

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                    | <b>SEMESTER</b> | <b>HOURS/ WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|----------------------------------------|-----------------|--------------------|---------------|-----------------|
| 3B04<br>COM        | Introduction to Computers and Networks | III             | 5                  | 4             | 3               |
| 4B06<br>COM        | Data Base management System            | IV              | 5                  | 4             | 3               |
| 5B11<br>COM        | Information Technology for Business    | V               | 4                  | 4             | 3               |
| 6B16<br>COM        | Accounting Packages - TALLY            | VI              | 4                  | 4             | 3               |

### III - FINANCE

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>    | <b>SEMESTER</b> | <b>HOURS/ WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|------------------------|-----------------|--------------------|---------------|-----------------|
| 3B04<br>COM        | Financial Management   | III             | 5                  | 4             | 3               |
| 4B06<br>COM        | Investment Management  | IV              | 5                  | 4             | 3               |
| 5B11<br>COM        | Goods and Service Tax  | V               | 4                  | 4             | 3               |
| 6B16<br>COM        | Corporate Tax Planning | VI              | 4                  | 4             | 3               |

#### IV - MARKETING

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>  | <b>SEMESTER</b> | <b>HOURS/ WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|----------------------|-----------------|--------------------|---------------|-----------------|
| 3B04<br>COM        | Marketing Principles | III             | 5                  | 4             | 3               |
| 4B06<br>COM        | Consumer Behaviour   | IV              | 5                  | 4             | 3               |
| 5B11<br>COM        | Promotion Management | V               | 4                  | 4             | 3               |
| 6B16<br>COM        | Market Research      | VI              | 4                  | 4             | 3               |

#### EVALUATION

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|-------------------|------------------|--------------|
| EXTERNAL          | 4                | 40*          |
| INTERNAL          | 1                | 10           |

\* 20 marks for theory and 20 marks for practical for courses having practical

#### CONTINUOUS INTERNAL ASSESSMENT

| <b>COMPONENT</b>                       | <b>WEIGHTAGE</b> | <b>MARKS</b> | <b>REMARKS</b>                                                                                          |
|----------------------------------------|------------------|--------------|---------------------------------------------------------------------------------------------------------|
| COMPONENT 1<br>Test paper              | 3                | 6            | Minimum two test papers and mark should be awarded on the basis of average mark obtained by the student |
| COMPONENT 2<br>Assignments/<br>Seminar | 2                | 4            | Department should keep a record of the work done                                                        |

Internal mark for test papers should be given as per the following criteria;

| Average mark obtained in the test papers | Percentage of internal mark |
|------------------------------------------|-----------------------------|
| 80% and above                            | 100%                        |
| 60% to 79%                               | 80%                         |
| 40% to 59%                               | 60%                         |
| 20 % to 39%                              | 40%                         |
| Below 20%                                | 20%                         |



## CORE COURSE I : - MANAGEMENT CONCEPTS AND PRINCIPLES

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| I        | 1B01 COM    | 5              | 4      | 3        |

### COURSE OUTCOME

After studying the course, students shall be able to;

CO1:- Understand the evolution of management thoughts, concept of management, scope and its functions.

CO2:- Familiarize with current management practices.

CO3:- Understand the importance of ethics in business.

CO4:- Acquire knowledge and capability to develop ethical practices for effective management.

CO5:- Describe the emerging trends in management.

#### **Unit I**

**Management Concepts:** Evolution of Management thoughts: Classical approaches - Scientific management, administrative management and bureaucracy- Neo classical approaches – Human relations and Behavioral approach - Modern approaches- Quantitative approach, systems approach, and contingency approach.

[15 Hours]

#### **Unit II**

**Functions of management-:** Planning-concept and importance - Planning process- Steps in Planning—barriers to effective planning-- Organizing- Nature and purpose of organization-Types of organization – line, functional, line and staff - Staffing: Concepts - manpower planning – process and importance

[18 Hours]

#### **Unit III**

**Functions of management -:** Directing: Meaning-definition- principles –techniques of direction. Motivation:- concept and importance – Theories : Maslow’s Need Hierarchy – Herzberg –Theory X and Theory Y – Leadership: concept – styles – leadership and management— Controlling: meaning-definition-essentials of effective control system.

(17 Hours)

#### **Unit IV**

**Business Ethics:** Meaning and scope – Types of ethics – Characteristics – Factors influencing business ethics – Arguments for and against business ethics – Basics of business ethics - Corporate social responsibility - Environmental issues in business-Ethics in advertising-Globalization and business ethics .

[20 Hours]

## Unit V

**Emerging concepts in management** – Kaizen – TQM – TPM – MIS – ISO – Change management – Stress management – Fish bone (ISHIKAWA) Diagram – Business eco system – Logistic management.

[20 Hours]

### References:

1. Boatwright. John R: Ethics and the Conduct of Business, Pearson Education, New Delhi.
2. Gupta. CB; Business management, Sultan Chand & sons
3. Koontz, H and Wehrick, H: Management, McGraw Hill Inc, New York.
4. Prasad. LM; Principles and Practice of Management; Sultan Chand & sons
5. Stoner. AF and Freeman RE; Management; Prentice Hall of India
6. Drucker, Peter, F., Management: Tasks, Responsibilities and Practices, Allied Publishers, New Delhi.
5. R.S Davar; Management Process
6. Rustum & Davan, Principles and Practice of Management.
7. Srinivasan & Chunawalla, Management Principles and Practice.
8. S. V. S. Murthy. Essentials of Management.

### Marks including choice:

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 12    |
| III   | 12    |
| IV    | 12    |
| V     | 10    |
| TOTAL | 56    |

**CORE COURSE II : FUNCTIONAL APPLICATIONS OF MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>II</b>       | <b>2B02 COM</b>    | <b>5</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After studying this course, the students shall be able to;

CO 1: Describe nature and scope of financial management and the elements in the management of finance

CO 2: Enumerate marketing management and its different aspects

CO 3: Explain Human Resources Management and the activities involved in it

CO 4: Understand the modern global marketing trends and its challenges

**Unit 1 Financial Management**

Concept of finance- Functions of finance - Meaning, scope and objectives of financial management – financial planning- sound financial plan capitalisation- overcapitalisation – under capitalisation- (meaning only) capital structure, factors determining capital structure- fixed capital – working capital – factors determining fixed and working capital- Source of finance- short term and long term,

(20Hrs)

**Unit II**

**Marketing Management**

Marketing-Meaning- nature and importance of marketing -functions of marketing - concept of modern marketing - marketing mix –elements – importance - product life cycle – stages of PLC and marketing strategies - Concept of branding and brand equity – market segmentation – concept – bases – patterns and significance –Target marketing -product positioning.

(20 hrs)

**Unit III**

Marketing in the globalised scenario – Digital marketing/ on line marketing / E Commerce – features – scope and challenges – Social media marketing – Relationship marketing — Social marketing - Direct marketing – Net work marketing / MLM– service marketing-scope – service marketing mix.

(15 hrs)

#### **Unit IV**

##### **Human Resource Management.**

Meaning definition, evolution, personnel management, functions and importance of HRM, duties and qualities of HR Manager .HR Planning, job analysis, description and job specification job evaluation, recruitment, sources of recruitment, selection process, interview, tests, placement and induction.

(20 hrs)

#### **Unit V**

Performance appraisal system: Meaning, objectives, methods and problems of performance appraisal. Training, need and importance, methods. Benefits of training. HRM in the post globalization era. HRM and competitive advantage

(15 hrs)

#### **References:**

1. Tripathy Reddy, Principles of Management, Tata Mc Graw Hill Publishers, New Delhi.
2. L.M. Prasad, Principles of Management, sultan Chand & sons, New Delhi.
3. M.Y. Khan and P.K. Jain, Financial management, Tata Mc Grawhill Publishers, New Delhi.
4. R.S. Goel, Operations management, Kalyani Publications, Ludhiana.
5. R. C. Agarwal, Marketing Management, Educational publishers, Agra.
6. Philip Kotler and Gary Armstrong, Principles of Marketing, PHI, New Delhi.
7. William. J .Stanton, Fundamentals of Marketing, McGraw-Hill, New York
8. Rajan Nair, Marketing Management, Sultan Chand & Sons, New Delhi.
9. C. B. Mamoria, Personnel Management, Sultan Chand&Sons, New Delhi.
10. I M. Pandey, Financial Management, Vikas Publishing House, New Delhi

#### **Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 12    |
| II    | 12    |
| III   | 10    |
| IV    | 12    |
| V     | 10    |
| Total | 56    |

### CORE COURSE III : ADVANCED ACCOUNTING

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| III      | 3B03 COM    | 6                 | 4      | 3           |

#### COURSE OUTCOME

After studying the course, the students shall be able to;

- CO 1. Understand the theoretical and practical knowledge of the basics of accounting.
- CO 2. Acquire the knowledge of accounting for royalty, Consignment and Hire Purchase
- CO 3. Imbibe the accounting concepts of Inland Branch Business.
- CO 4. Comprehend the procedure for determining profit and financial position from incomplete records.

#### **Unit I :**

**Introduction to Accounting:** meaning and objectives of Accounting – Journal – Ledger – Trial Balance - Final Accounts of Sole Trading Concern – Manufacturing Account - preparation of Trading and Profit and Loss Accounts – preparation of Balance Sheet – Adjusting and Closing Entries.

(25 Hrs)

#### **Unit II :**

**Royalty accounts:** meaning – minimum rent – short workings – recoupment of short workings – accounting procedures in the books of the parties- (sub lease not required)

(18 Hrs)

#### **Unit III:**

**Accounts of Special Transactions:** Consignment Accounts – concepts – accounting treatment – cost price and invoice price – unsold stock – loss of goods - Hire purchase Accounting – meaning and objectives - ledger accounts in the books of Hire vendor and Hire Purchaser – Full Cash Price, Actual Cash Price and Interest Suspense Methods ((HP trading account not required) - interest calculations – ascertainment of Cash Price – repossession – Instalment System (meaning only) - differences between Hire Purchase and Instalment Systems.

(25 Hrs)

#### **Unit IV:**

**Inland Branch Accounts:** Accounts of dependent and independent branches – Debtors system, Stock and Debtors System (at cost price and invoice price) – Incorporation of branch Trial Balance in the books of H.O. - Preparation of consolidated accounts.

(20 Hrs)

**Unit V:**

**Accounts from Incomplete Records:** Single Entry meaning- features -0 difference between single entry and double entry system - Methods of profit determination –Capital comparison method - Conversion method.

(20 Hrs)

**References :**

1. Advanced Accounting :M.C.Shukla&T.S.Grewal
2. Advanced Accounting :R.L.Guptha
3. Advanced Accounting :S.N.Maheshwari
4. Advanced Accounting :B.S.Raman
5. Advanced Accounting : Ashok Sehgal& Deepak Sehgal
6. Advanced Accounting :S.K.R.Paul
7. Advanced Accounts VolumeII : Shukla: M.C., T.S.Grewal and S.C.Guptha (S.Chand&Co.,New Delhi)
8. Advanced Accountancy, Volume II :Guptha R.L. and M.Radhaswami (Sulthan Chand & Co. New Delhi)
9. Financial Accounting :B.K.Banerjee (PHI Pvt.Ltd.New Delhi)

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 8     |
| II    | 10    |
| III   | 16    |
| IV    | 12    |
| V     | 10    |
| Total | 56    |

## CORE COURSE V : CORPORATE ACCOUNTING

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| IV       | 4B05 COM    | 6                 | 4      | 3           |

### COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1: Understand the mode of presentation and understanding of financial reporting .

CO 2: Learn the accounting procedure for recording transaction relating to the issue and redemption of shares and debentures.

CO 3: Imbibe the techniques of recording transactions in respect of amalgamation, reconstruction and liquidation of companies..

CO 4: Understand the concept of IFRS and Ind AS

#### **Unit I :**

##### **Issue of shares and debentures:**

Issue of shares – issue at par, premium and discount – under and over subscription – pro-rata allotment - calls in arrear – calls in advance – forfeiture and reissue – redemption of preference shares – redemption out of profit and out of proceeds of fresh issue – issue and redemption of debentures- redemption by purchase (only)

(20 Hrs)

##### **Unit II: Final Accounts of Companies:**

Preparation of Balance Sheet and Profit & Loss Account (in new format) – compulsory transfer to Reserve (Corporate dividend tax need not be considered). Computation of Profit prior to incorporation

(25 Hrs)

##### **Unit III: Accounting for Amalgamation and reconstruction:**

Meaning and types of amalgamation – purchase consideration – methods of ascertaining purchase consideration - Amalgamation in the nature of Merger and Amalgamation in the nature of purchase – differences – methods of accounting – Pooling of interest method and purchase method — accounting entries in the books of both transferor and transferee companies (excluding intercompany holdings) – reconstruction – types – External and Internal reconstructions – Accounting entries only.

(30 Hrs)

##### **Unit IV: Liquidation of companies:**

Meaning and types of winding up – Statement of Affairs – Deficiency or Surplus Accounts – Liquidator’s Final Statement of Account.

(15 Hrs)

**Unit V: Accounting Standards for Financial Reporting:**

Objectives and uses of financial statements for users – Role/objectives of accounting standards - Development of accounting standards in India - Requirements of international accounting standards -International organizations engaged in accounting harmonization - IASB – FASB Role of IASB in developing IFRS - IFRS adoption or convergence in India -Implementation plan in India - Ind AS - Differences between Ind AS and IFRS -Conceptual framework - Definition of financial elements - Principles of recognition, measurements, presentation and disclosure.

(18 Hrs)

**Books for Reference:**

1. Advanced Accounts VolumeII : Shukla: M.C., T.S.Grewal and S.C.Guptha (S.Chand&Co.,New Delhi)
2. Advanced Accountancy, Volume II :Guptha R.L. and M.Radhaswami (Sulthan Chand & Co. New Delhi)
3. Corporate Accounting :Maheshwari. S.N. and S.K.Maheshwari, (Vikas publishing House, New Delhi)
4. Corporate Accounting : Ashok Sehgal and Deepak Sehgal,(Taxman Publication, New Delhi)
5. Corporate Accounting : S.P. Jain and K.L.Narang (Kalyani Publishers, New Delhi)
7. Financial Accounting :B.K.Banerjee (PHI Pvt.Ltd.New Delhi)

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 12    |
| III   | 18    |
| IV    | 10    |
| V     | 6     |
| Total | 56    |



## CORE COURSE VII: BUSINESS RESEARCH METHODOLOGY

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5B07 COM    | 4                 | 3      | 3           |

### COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: Understand the fundamental aspects of research in business

CO2: identify and define research problem

CO 3: formulate research plan

CO 4: understand various methods of collecting data

CO 5: prepare research report themselves

#### **Unit I: Introduction to Research**

Meaning and Definition of Research, Purpose, Types of research, Criteria of good research, Scientific method and its basis – Induction and Deduction, Business Research – Meaning, scope, Functions; Steps in Research process (a brief description only)

(15 Hrs)

#### **Unit II: Research Problem**

Meaning and Definition, sources of problem, Formulation of problem, criteria of a good research problem

(10 Hrs)

#### **Unit III: Research Design**

Meaning, Importance, Concepts related to research design, types of research design- Exploratory, Descriptive/ Diagnostic, Experimental/ Hypothesis testing research designs, Contents of research design.

(10 Hrs)

#### **Unit IV: Sampling Design**

Meaning of Sampling, Sample, Sample frame, Sample size; Methods of Sampling- Probability and non-probability sampling techniques, Steps for selecting sample

(13 Hrs)

#### **Unit V: Data Collection**

Meaning and types of data: Primary and Secondary data; Methods of collecting primary data; Secondary data- Meaning, sources, Precautions to be taken before using secondary data.

(12 Hrs)

#### **Unit VI: Report writing**

Meaning, qualities of a good report, types, steps in report writing, Layout of research report- Prefatory items, Main body, Terminal items.

(12 Hrs)

**References:**

1. C.R. Kothari: Research Methodology, New Age International Publishers
2. O.R. Krishnaswamy: Research Methodology, Himalaya Publishing House
3. P. Saravanel: Research Methodology
4. O.R. Krishnaswamy & M. Ranganatham: Methodology of research in Social Sciences, Himalaya Publishing House
5. Shashi K Gupta & Praneet Rangi: Business Research Methods, Kalyani Publishers
6. L.R. Potti: A text book of Business Research Methods, Yamuna Publications

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 08    |
| III   | 10    |
| IV    | 08    |
| V     | 10    |
| VI    | 10    |
| Total | 56    |

**CORE COURSE VIII : INCOME TAX LAW AND PRACTICE**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B08 COM</b>    | <b>5</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After studying this course, the students shall be able to;

CO 1 Define the basic concepts in Income tax, explain its evolution

CO 2 Determine the residence and incidence of Tax

CO 3 Understand the incomes exempt from tax of an individual

CO 4 Compute income under different heads of income

**Unit I :**

Introduction to Income Tax – Evolution of Income Tax – Income Tax Act 1961 - Finance Act – Income Tax Rules 1962 – Basic Concepts – Definition of different terms – Agricultural Income – Capital and Revenue Receipts – Expenditure and Losses .

(10 Hours)

**Unit II :**

Residence and Incidence of Tax - Determination of Residential Status of different types of assesses – problems – scope of total income – incomes exempt from tax (for individual assesses) – problems – computations – tax holiday.

(15 Hours)

**Unit III:**

Heads of Income – Incomes included under salary – allowances – perquisites and their valuation – profits in lieu of salary – Provident Fund – computation of income from salary - Income from house property – basis of charge – annual value in different cases – self occupied – let out – vacancy and unrealized rent – deductions - computation of income from house property

(30 Hours)

**Unit IV:**

Profits and gains of business or profession – meaning of business – profession – vocation – basis of charge – general principles – deduction in computing business income – computation of profits from business – deduction in computing professional income – computation of gain from profession – depreciation – block of assets – written down value method- Capital gain – basis of charge – capital asset – short term and long term – transfer – capital gain in special cases – exemption from capital gain – computation of income from capital gain

(25 Hours)

**Unit V:**

Income from other sources – basis of charge – general and specific items of income – interest on securities – deductions allowable – computation of income from other source .

(10 Hours)

**Note : Consider the Current rate for calculations**

**Questions should be asked based on provisions relating to current assessment year.**

**References :**

1. Income tax Law and Accounts :Dr.H.C.Mehrotra and S.P.Goyal
2. Income tax Law and Practice :Dr.Bhagavathi Prasad.
3. Income tax Law and Practice : Gaur and Narang
4. Income tax Law and Practice :B.S.Raman.
5. Direct taxes Law and Practice : Dr.Vinod K. Singhanian&Dr.KapilSinghanian

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 6     |
| II    | 10    |
| III   | 18    |
| IV    | 14    |
| V     | 8     |
| Total | 56    |

## CORE COURSE IX: COST ACCOUNTING

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5B09 COM    | 5                 | 4      | 3           |

### COURSE OUTCOME

After studying this course, students shall be able to:

CO 1: Explain the nature, scope, objectives and limitations of costing

CO 2: Identify the elements of cost and describe the methods of their ascertainment and control

CO 3: Explain the various methods of costing and their suitability for different industries

CO 4: Ascertain the cost of production of products and jobs

#### **Unit I:**

Introduction to Cost Accounting – concepts, objectives and advantages – Financial Accounting and Cost Accounting –Elements of cost and cost classification – cost centre and cost unit- methods of costing - preparation of cost sheet

(10 Hrs)

#### **Unit II:**

Materials :- Concepts- centralized buying - purchase procedure– Store records – Bin card and stores ledger - methods of material issue pricing (FIFO, LIFO, Simple and weighted averages), stock levels, EOQ, ABC Analysis, VED Analysis – Essentials steps for material control

(15 Hrs)

#### **Unit III:**

Labour: - Concepts - Time keeping. Time booking- Wage system -Time rate, Piece rate, Taylor's differential piece rate system - Incentive system of wage payment -Halsey and Rowan Plan – Treatment of idle time - overtime – Labour turnover meaning and causes (theory only)

(15 Hrs)

#### **Unit IV:**

Over heads: - Concepts- classification, Allocation and apportionment -Direct, Simultaneous equation, Step ladder and Repeated distribution method- Absorption of overheads -Labour hour rate method and machine hour rate method – calculation of machine hour - Under and over absorption of overheads (meaning only)

(20 Hrs)

**Unit V:**

Methods of Costing –Job costing, batch costing, unit costing, Process costing: features – typical process industries - process accounts- normal loss and scrap- abnormal loss and gain – Explanation on Joint products and by products – Contract costing: Special features- Cost plus contract- Escalation clause- Sub contract- Retention money- Treatment of cost of plant – Profit on incomplete contract.

(30 Hrs)

**Books for Reference:**

1. Cost Accounting principles and Practice :Iyengar . S.P
2. Cost Accounting :S.P.Jain& K.L. Narang
3. Management Accounting :Dr.S.P.Gupta
4. Management Accounting :R.K.Sharma&S.K.Gupta
5. Cost Accounting :JawaharLal.
6. Cost Accounting :Dr. A.D. Agarwal
7. Practical Cost Accounting :Dr. A.D. Agarwal
8. Lectures on Costing :Swaminathan

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 8     |
| II    | 10    |
| III   | 10    |
| IV    | 12    |
| V     | 16    |
| Total | 56    |

## CORE COURSE X : BANKING PRINCIPLES AND OPERATIONS

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5B10 COM    | 5                 | 4      | 3           |

### COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1: Explain banking and describe the different types of banks and the functions of commercial bank

CO 2: Narrate the role of RBI in the credit control, promotion and regulation of monetary system

CO 3: Describe the relationship between banker and customer and the procedure for opening and operating the account

CO 4 : Understand the modern trends and technology used in banking

#### **Unit I :**

Introduction to Banking – meaning – features –commercial banks and their functions – Classification of banks in India – List of Nationalised banks in India – Scheduled banks – New generation Private sector banks – Co operative Banks in Kerala – meaning – features – structure and importance – Role of Banks in economic development.

( 20 Hrs)

#### **Unit II :**

Reserve Bank of India – Functions – Credit control measures – quantitative and qualitative methods- Promotional and Regulatory measures – Repo - Reverse Repo.

(15 Hour)

#### **Unit III:**

Banker and Customer – General relationship and Special Relationship – Opening and Closing of Bank accounts – KYC norms - Cheques – features – crossing – types- endorsement – types – banking ombudsman

20 Hours)

#### **Unit IV:**

Loans and advances – Principles of sound Lending – Loan – Cash credit – Overdraft – Consortium advances – Modes of creating charges – Lien - pledge – Hypothecation – mortgage and guarantee

(15 Hrs)

#### **Unit V:**

Recent trends and Technology in Banking – Need and importance – Online/ internet Banking – Mobile application banking – Core banking – RTGS – NEFT - IMPS -MCLR – IBC – MSME- TReDS -- BASEL NORMS – NPA monitoring and recovery-- Digital banking – Payment Gateways – Supply chain finance – Retail lending – Sale of third party products – Sarfaesi —Direct benefit transfer .(a brief outline of all the terminologies )

(20 Hours)

**References:**

1. Bankig theory and practice- K C Shekar
2. A text book of Banking – M Radhaswami and S V Vasudevan
- 3 Banking law and practice – Maheswari
4. Banking and Financial system- Vasant Desai
5. Modern Banking – K P M Sundaram and E N Sundaram

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 12    |
| II    | 10    |
| III   | 12    |
| IV    | 12    |
| V     | 10    |
| Total | 56    |



## CORE COURSE XII : FINANCIAL MARKETS AND SERVICES

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| VI       | 6B12 COM    | 4                 | 3      | 3           |

### COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: understand the financial system and its constituents

CO2: familiarise with the activities taking place in the financial markets

CO 3: Appraise the various financial services available in the financial markets

CO 4: acquire knowledge about financial derivatives and their features

### **Unit I**

**Indian financial system:** Financial system, meaning, structure—financial markets- financial institutions- financial instruments – financial services- Role of financial system in economic development –Financial markets and instruments

[10 Hours]

### **Unit II**

**Money market** –Meaning – features- functions or importance- components – Call money market – commercial bill market- acceptance market – treasury bill market- Money market instruments- Treasury bill-Commercial bills – Commercial papers – Certificate of Deposits

[12 Hours]

### **Unit III**

**Capital Market-** Meaning –Primary Market, methods of floating new issue, - Secondary market - Stock exchange- Functions- listing of securities-Dematerialization and Depository services

[15 Hours]

### **Unit IV**

**Financial Services** – meaning – nature and scope – Types - Merchant banking – Meaning, objectives and functions- Mutual funds – Meaning, objectives and types of schemes - Credit rating –Meaning, functions and major agencies (CRISIL,ICRA,CARE)- Factoring- Meaning, objectives and mechanism - Venture Capital –meaning, features, funding pattern

[22 Hours]

## **Unit V**

**Financial Derivatives** - meaning- definition- types- forwards- futures- options – swaps- types and features, advantages and limitations of financial derivatives (An overview of financial derivatives only)

(13 Hours)

### **Reference:**

1. Financial Institutions & Markets : L.M. Bhole.
2. Marketing of Financial Services : V.A Avdhani.
3. Investment Management : V.K Bhalla.
4. Indian Financial System : Vasant Desai
5. A profile of Indian Capital Market : Vinayakan.
6. Financial Markets and Services: E. Gordon and K. Natarajan
7. Financial Markets, Institutions & Services : N.K Gupta & Monika Chopra Hours]
8. Futures And Other Derivatives: Hull John

### **Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 8     |
| II    | 12    |
| III   | 12    |
| IV    | 16    |
| V     | 8     |
| Total | 56    |

### CORE COURSE XIII : MANAGEMENT ACCOUNTING

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| VI       | 6B13 COM    | 5                 | 4      | 3           |

#### COURSE OUTCOME

After studying the course, the students shall be able to;

- CO 1. understand the fundamental concepts of management accounting.
- CO 2. acquire analytical skills associated with the interpretation of accounting reports
- CO 3. apply management accounting concepts in real life situations.
- CO 4. develop judgmental skills associated with the use of accounting information in decision making.
- CO 5. understand the use of marginal costing and budgetary control to plan and control cost and profit.

#### **Unit I:**

**Introduction to Management Accounting:** Meaning- Definitions, Objectives, Uses- Scope of Management Accounting – Management Accounting Vs Financial Accounting - Management Accounting Vs Cost Accounting.

(8 Hrs)

#### **Unit II:**

**Analysis and interpretations of financial statements:** Financial Statements – meaning, nature and limitations - Financial Statement Analysis – concept and meaning – types – tools of financial analysis - Comparative Financial statements, Common- size Financial statements, Trend analysis - Ratio analysis – concepts, definition, advantages, limitations- Types of ratios- Liquidity Ratios, Solvency Ratios, Activity Ratios, Profitability Ratios and Market test Ratios – computations and interpretations. (Construction of final accounts are not expected)

(32 Hrs)

#### **Unit III:**

**Cash flow statements:** meaning, concepts, definitions and uses - Preparation of Cash Flow Statement in both Direct and Indirect Methods (in vertical form as per AS 3).

(20 Hrs)

#### **Unit IV:**

**Marginal Costing:** meaning, objectives and features- contribution - CVP Analysis- BEP Analysis -Computation of BEP and sales to earn a desired level of profit - P/V Ratio-computation - managerial uses of Marginal Costing ( Profit planning, Fixation of price, Make or buy decisions & Problem of key factor/limiting factor only)

(20 Hrs)

**Unit V:**

**Budgetary control:** Concepts, Objectives and classification of budgets- Preparation of Cash, Sales and Flexible Budgets.

(10 Hrs)

**Reference:**

1. Management Accounting : Sharma R.K & Sasi K Guptha
2. Management Accounting : N.M Singhvi & Bodhan Wale
3. Management Accounting : RSN Pillai & Bhagavathi
4. Management Accounts : S N. Maheswari
5. Management Accounts : S.P. Guptha

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 6     |
| II    | 18    |
| III   | 12    |
| IV    | 12    |
| V     | 8     |
| Total | 56    |

## CORE COURSE XIV: AUDITING AND CORPORATE GOVERNANCE

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| VI       | 6B14 COM    | 5                 | 4      | 3           |

### COURSE OUTCOME

After studying the course, the student shall be able to;

CO 1: understand the term auditing, its concept, principles, procedures and requirements needed for Auditing in accordance with current legal requirements and professional standards.

CO 2: familiarize with the various aspects of audit consisting of internal check, vouching, verification and valuation of assets and liabilities

CO 3: understand the appointment, rights, duties and the liabilities of an auditor.

CO 4: explain the concept of Corporate Governance and its aspects

#### **Unit I**

Introduction – Meaning- Definition- Objectives - Concept of auditor’s independence- Types of audit– statutory audit–private audit- government audit - continuous audit– final audit – interim audit - cost audit – management audit – tax audit – Social audit - performance audit –Internal audit - Investigation; Meaning of Investigation- Distinction between investigation and auditing.

(20 Hrs)

#### **Unit II**

Audit Process -- Documentation - Preparation before audit-Audit Programme-Audit Note Book-Audit Working Papers-Audit Files- Internal Control and Internal Check–Principles of Internal check.

(15 Hrs)

#### **Unit III**

Vouching and Verification - Vouching - meaning and importance- Requirements of a voucher -Vouching of various items (Cashbook – Credit purchase- credit sales- goods sent on consignment- journal proper- outstanding assets & liabilities- capital and revenue expenditures only) Verification – meaning-Difference between vouching and verification- general principles for verifying assets-Valuation of assets;Difference between verification and Valuation- Verification and valuation of Assets (Cash at bank, Loan advanced, Debtors, Stock, Plant & Machinery, patents, Goodwill, Motor vehicles only) --Verification and valuation of Liabilities (Creditors, Loans, Debentures, Capital, Contingent liability only)

(25 hrs)

#### **Unit IV**

Audit of Limited Companies- appointment- -Qualifications and Disqualifications of an Auditor- Auditor’s remuneration- Auditor’s lien- Removal of an auditor- Rights, Powers and Duties of an Auditor -Liabilities of an Auditor – Auditor’s Report – content- types

(20 Hrs)

**Unit V:**

Conceptual Framework of Corporate Governance: Meaning, Benefits of Corporate Governance; board committee and their functions- insider Trading - Green Governance/E-governance.

(10 Hrs)

**References:**

1. Bhatia R.C. *Auditing*, Vikas Publishing House, New Delhi.
2. DinkarPagare *Auditing*, Sultan Chand & Sons New Delhi.
3. JagadeeshPrakash . *Auditing: Principles and Practices*, Chaitanya Publishing House, Allahabad.
4. Kamal Gupta. *Contemporary Auditing*, Tata McGraw-Hill Publishing Co.Ltd. New Delhi.
5. Saxena and Saravanavel *Practical Auditing*, Himalaya Publishing House, Mumbai.
6. Sharma R. *Auditing*, Lakshmi NarainAgarwal, Agra.
7. Sharma T.R. *Auditing*, SahityanBhawan Publications, Agra.
8. Tandon B.N. *Practical Auditing*,S Chand &Co.Ltd. New Delhi.
9. Mallin, Christine A. *Corporate Governance*, Oxford University Press, New delhi
10. Rani, Geeta D and R.K. Mishra, *Corporate Governance- Theory and Practice*, Excel Books New Delhi

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 13    |
| III   | 12    |
| IV    | 13    |
| V     | 8     |
| Total | 56    |

**CORE COURSE XV: INCOME TAX AND GST**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B15 COM</b>    | <b>5</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After studying this course, the students shall be able to;

CO 1: Compute total income and determine the tax liability of an individual and partnership firm, company and cooperative society

CO 2: Describe the income tax authorities, their powers and assessment procedure

CO 3: Explain the procedure regarding deduction of tax at source, advance tax, refund, penalties and prosecution

CO 4: Describe Goods and Service Tax, its levy and collection

**Unit I**

Clubbing of Income – provisions – deemed income – aggregation of income – set off and carry forward of losses –Computation of Gross total Income - Deduction from gross total income Computation of total income –

(20 Hours)

**Unit II**

Assessment of individuals - computation of tax – assessment of partnership firms – computation of tax - assessment of Co-operative Societies – Computation of total income and tax liability

(25 Hours)

**Unit III**

Income Tax Authorities and their powers – CBDT – Powers and functions – Commissioner of income tax – powers and functions – income tax officers. Assessment procedure – types of return – procedure for filing return – e filing- PAN – types of assessments – rectification of mistakes

(10 Hours)

**Unit IV**

Deduction of Tax at Source – items of income from which tax is deducted at source – collection of tax at source - Advance payment of tax – refund of tax – Penalties and prosecution –provisions .

(20 Hours)

**Unit V**

Goods and Services Tax: Brief history behind the emergence of GST – The scope of GST –Definitions and meaning - Central Goods and Services Tax Act–Integrated Goods and Services Tax Act - State Goods and Services Tax Act - Levy and Collection of Central/State Goods and Services Tax - Taxable person - Power to grant exemption from tax - Time and value of supply of goods - Time of supply of services

(15 Hours)

Note : Questions should be asked based on provisions year relating to current assessment year.

**Consider the Current rate for calculations**

**References :**

1. Income tax Law and Accounts :Dr.H.C.Mehrotra and V.P.Goyal
2. Income tax Law and Practice :Dr.Bhagavathi Prasad.
3. Income tax Law and Practice : Gaur and Narang
4. Income tax Law and Practice :B.S.Raman.
5. Direct taxes Law and Practice : Dr.Vinod K. Singhanian&Dr.KapilSinghanian
6. Goods and Service Tax, Dr. H C Mehrotra and Prof. V.P.Goyal

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 18    |
| II    | 14    |
| III   | 8     |
| IV    | 8     |
| V     | 8     |
| Total | 56    |



## CORE COURSE XVII: PROJECT

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| VI       | 6B17 COM    | 2                 | 2      | -           |

### COURSE OUTCOME

**CO 1: understand the method of carrying out a project**

**CO2: undertake project work independently**

#### **Guidelines for Project**

1. During the sixth semester every student shall do a project .The student may choose any topic from the subjects he/she has studied.
2. The candidate shall prepare and submit a project report to the Department.
3. The report shall be in English with not less than 30 pages, printed or typed (A4 size paper, 1.5 line spacing, Times New Roman font, font size 14) and spiral bound.
4. The project report should be submitted to the Head of the Department one week before the last working day of the sixth semester, duly certified by the Guide.
5. The project can be done individually or as a group of four students (maximum) on the same topic and present the report. However, the project supervisor should make sure that each student constructively contributes to the completion of the project.
6. The work of each student shall be guided by one Faculty member.
7. The candidate shall prepare at least two copies of the report; one copy for submission to the Department and another copy for the student, which he/she has to bring with him/her at the time of viva voce.
8. Duration of project work -The duration for project work is 3 weeks.
9. A certificate showing the duration of the project work shall be obtained from the supervising teacher or from the organization for which the project work was done and it should be included in the project report.
10. Structure of the report
  - a) Title page
  - b) Certificate from the supervising teacher / organization (for having done the project work)
  - c) Acknowledgements
  - d) Contents
  - e) Chapter I: Introduction (Organization profile, Research problem, Objectives of the study, Research methodology etc.)
  - f) Chapter II : Review of Literature
  - g) Chapters III and IV: Data Analysis (2 or 3 chapters)
  - h)Chapter V : Findings, Suggestions and Conclusion.
  - i) Appendix : (Questionnaire, specimen copies of forms, other exhibits etc.)
  - j) Bibliography: (books, journal articles etc. used for the project work).

### **Evaluation of project report**

The project report shall be subject to internal and external evaluation. The internal evaluation shall be carried out by the supervising teacher and external evaluation done by the external examiners appointed by the University

1. Evaluation of the Project Report shall be done under Mark System. Total mark for the project will be 50. Marks secured for the project will be awarded to candidates, combining the internal and external marks
2. The internal to external components is to be taken in the ratio 1:4.

Assessment of different components may be taken as below.

| Internal (20% of total)                |            | External (80% of total)                                                                  |            |
|----------------------------------------|------------|------------------------------------------------------------------------------------------|------------|
| Components                             | % of marks | Components                                                                               | % of marks |
| Punctuality                            | 20         | Relevance of the topic, statement of objectives, methodology, reference/ bibliography    | 20         |
| Use of data                            | 20         | Presentation, quality of analysis/use of statistical tools, findings and recommendations | 30         |
| Scheme/ organisation of project report | 30         | Project Viva-Voce                                                                        | 50         |
| Project Viva-Voce                      | 30         |                                                                                          |            |
|                                        | 100        |                                                                                          | 100        |

3. There shall be no improvement chance for the marks obtained in the Project Report.

## CORE COURSES IN THE ELECTIVE STREAM

### ELECTIVE STREAM I – CO-OPERATION

#### CORE COURSE IV : CO-OPERATION I – CO-OPERATIVE PRINCIPLES

| SEMESTER   | COURSE CODE     | HOURS PER WEEK | CREDIT   | EXAM HRS |
|------------|-----------------|----------------|----------|----------|
| <b>III</b> | <b>3B04 COM</b> | <b>5</b>       | <b>4</b> | <b>3</b> |

After studying this course, students shall be able to;

CO 1: Understand the concepts and principles of Cooperative movement

CO2: Understand the origin of cooperative movement and the history of cooperatives in the world

CO 3: Describe Indian cooperative movement, its features , structure and significance

CO 4: Acquaint themselves with the system of cooperative education, training and its impact on the functioning of cooperative organisations

**Unit I : Philosophy and genesis of co-operative movement** - Definition and meaning of Cooperation – ICA definition-characteristics. Evolution of co-operative principles – Rochdale principles- Reformulated principles of 1966- Redefined principles of 1995 – Application of the principles. Co-operatives as economic enterprises – its importance – differences between other forms of organizations and cooperative enterprise. Cooperation and other economic systems-Capitalism, socialism and communism. Importance of Cooperative organisations in the economic development.

[20 Hours]

**Unit II : Co-operative movements in Foreign countries** Origin of co-operative movement in England – Experiments of Robert Owen (Doctrine of circumstances – Friendly societies – Labour colonies – Labour exchanges) – Rochdale pioneers – C.W.S.S, -Credit cooperatives in Germany –Raiffiesen and Schulze movement –Dairy and poultry co-operatives in Denmark – M.P.C.S in Japan –industrial co-operatives in China – collective farms in U.S.S.R. Marketing co-operatives in U.S.A – Consumer societies in Sweden.

[25 Hours]

**Unit III: Co-operation in India** – Early experiments –Frederic Nicholson’s Report-Maclegan committee on cooperation –Co-operative planning Committee 1945 – All India Rural Credit Survey Committee –All India Rural Credit Review Committee – CRAFTICARD – Kapoor Committee. Co-operatives in Kerala (an overview of various kinds of cooperative organisations functioning in Kerala)

[20 Hours]

**Unit IV: Rural credit** – classification of credit based on period, purpose and security- structure of co-operative credit- three tier and two tier credit –Multi agency approach to rural credit- Institutional agencies providing rural credit. NCDE, NHB, NABARD, etc; National Rural Credit Stabilisation Fund and National Rural Credit (L.T.O) Fund. Constitution and working of N.C.D.C – Role of N.C.D.C in the development of co-operatives.

[10 Hours]

**Unit V :Co-operative education and training** – objectives and significance – International cooperative Alliance –Role - National Co-operative Union of India – constitution and working – NCCT-NCCE-VAMNICOM- ICM.Structural arrangement for training –co-operative training centres- co-operative training colleges- member education units – other functions. Publicity and propaganda –journal – cooperative week celebrations-co-operative flag  
CAPE-ACSTI-KICMA.

[15 Hours ]

**Reference:**

1. Theory and Practice of Co-operation in India : Kulkarni
2. Co-operative Movement in India : J. Banerjee
3. Co-operative Movement in India : F.M Hough
4. Co-operation –Principles and Practice : T.N Hajela
5. All India Rural Credit Survey Report
6. Co-operation in India : Dr. M.S Mathur
7. Theory, History and Practice of Co-operation : R.D Bedi
8. Co-operation at Home and Abroad : C.R Fay
9. Co-operation in Foreign Countries :Rajagopalan
10. Co-operation in India and Abroad : K.P Bhatnagar

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 13    |
| II    | 13    |
| III   | 12    |
| IV    | 8     |
| V     | 10    |
| Total | 56    |

**CORE COURSE VI : CO-OPERATION II – MANAGEMENT OF CO-OPERATIVES**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>IV</b>       | <b>4B06 COM</b>    | <b>5</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After studying this course, students shall be able to;

CO 1: Understand kinds of cooperatives in India

CO 2: Understand the management and administration of different types of cooperatives

CO 3: Identify the role and significance of cooperative organization in Kerala's Economy

CO 4: Describe various kinds of cooperative institutions

**Unit I: Credit Cooperative Societies** – Meaning-features – significance-Primary Agricultural Credit Societies(PACS) definition –membership-constitution, objectives and working- differences between Primary Agricultural Credit Societies and Farmers Service co-operative Societies – crop loan system – linking of credit with marketing –kissan credit card –procedure to sanction loans –role of PACS in rural development–Central co-operative banks – membership- objectives-constitution of board of management – problems – over dues- suggestions for improvement. Kerala State co-operative Bank – origin- membership constitution- objectives- constitution of board of management – problems and suggestions for improvement.

[20 Hours]

**Unit II: Long term credit** –Agricultural and rural development – need for separate institutions -debentures - Debenture Redemption Fund- Primary co-operative agricultural and rural development bank- constitution, objectives and working – Kerala State Co-operative Agricultural and Rural Development Bank -membership- constitution of board of management – objectives and working problems and suggestions for improvement. Procedure in granting loans- over dues in long term credit societies –NPA.

[15 Hours]

**Unit III: Non Agricultural credit societies** – Primary co-operative urban banks- membership constitution, objectives and working (in brief)- Employees credit societies – membership –constitution, objectives and working (in brief)- Co-operative housing societies – importance and advantages – types of housing societies – HOUSEFED – constitution and working (in brief) – sources of funds – problems.

[15 Hours]

**Unit IV: Marketing and Processing Societies** – meaning of co-operative marketing – need, and importance – types of marketing societies Structure of cooperative marketing - primary marketing societies -- Kerala State Co-operative Marketing Federation Ltd.- NAFED- Processing co-operatives – meaning and importance-. Consumer co-operatives – Origin and importance of consumer co-operatives – structure-primary co-operative consumer stores –Kerala State Co-operative Consumers’ Federation - National Co-operative Consumers Federation- role of consumer co-operatives in holding the price line.

(20 Hours)

**Unit V: Industrial co-operatives** –Meaning –features- Types- handloom societies – Structure-, objectives and working- Primary handloom weaver’s co-operative societies, HANTEX- Coir co-operatives – types-objects and working- primary coir societies and COIRFED- Dairy co-operatives - Anand pattern objects and working primary milk producer’s co- operative society- Regional co- operative milk producer’s union – MILMA-NDDDB- problems of dairy co-operatives – khadi and village industrial societies –SC/ST societies –NSFDC –Fisheries societies- MATSYAFED, Federation of women co-operative societies – Labour contract cooperatives –Farming societies –Motor transport cooperatives-Co-operative printing press- Dinesh Beedi –RAIDCO-SPCS-CAMPSCO-RUBCO-IFFCO,KRIBHCO.(Brief outline only)

[20 Hours]

**Books for Reference:**

1. Theory and practice of co-operation in India : Kulkarni
2. Co-operative Movement in India : J. Banerjee
3. Co-operation Principles and Practice : T.S Balan
4. Co-operation principles and practice : T.N Hajela
5. Co-operation in India : Dr. M.S Mathur
6. Theory, history and practice of co-operation : R.D Bedi
7. Madras co-operative Manual co-operativemovement in India : Vol. I, II and III : J.C Rajan
8. Co-operation at home and abroad : C.R Fay
9. Co-operation in foreign countries :Rajagopalan
10. Co-operation in India and abroad : K.P Bhatnagar.

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 13    |
| II    | 10    |
| III   | 8     |
| IV    | 13    |
| V     | 12    |
| Total | 56    |

**CORE COURSE XI : CO-OPERATION III – CO-OPERATIVE LAWS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B11 COM</b>    | <b>4</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After studying the course, the students shall be able to:

CO 1: Understand the historical perspective of cooperative legislation in India and Kerala.

CO2: Understand the provisions of Kerala cooperative Societies Act 1969

CO 3: Describe the procedure for the formation and registration of a cooperative organisation

CO 4: describe the provisions of management and winding up of cooperative societies

**Unit I**

**History of co-operative legislation in India** Co-operative Credit Societies Act 1904 – features-limitations- Co-operative Societies Act 1912- features-difference between 1904 Act and 1912 Act- Multi- State Co-operative Societies Act 2002 –features-(Broad features only)

[15 Hours]

**Unit II**

**Kerala Co-operative Societies Act and Rules 1969** – Historical back ground- Definitions –Registration of co-operative societies –Byelaws –contents- Amendment- Amalgamation and division of societies- Membership- Rights, duties and liabilities – Withdrawal and expulsion.

[12 Hours]

**Unit III**

**Management of co-operatives** – general body –Managing committee- powers and duties-adhoc committee-disqualification of committee members- Election of committee members- supersession of committee. Election of president –powers and duties- Secretary-duties and responsibilities–Privileges of societies- State aid to co-operatives. Appointment of employees - Co-operative Service Examination Board.- Investment of funds-Disposal of net profit.

[15 Hours]

**Unit IV**

**Meetings** –Types- Annual general body meeting- special meetings. Requisites of a valid meeting – agenda - quorum- notice- minutes- duties of secretary .

[10 Hours]

## **Unit V**

**Inquiry and Winding up of societies** –Inquiry – supervision and inspection-surcharge-winding up of societies- liquidator- powers- cancellation of registration .

[20 Hours]

### **References:**

1. Kerala Co. op. Societies Act and Rules : Pillai
2. Kerala Co.op Societies Act and Rules : T.S Balan
3. Law for the Co.operatives : R.O Bedi
4. Law and Management of Co. operatives : Trivedi. BB
5. Co.operative Act and Rules : N.A Kareem
6. Co.operative Societies Act and Rules :Thankappan
7. Bare Act
8. Cooperative democracy in Action : O.R Krishnswami
9. Legal aspects of co-operation : P.M Natesan,N.JShaji, &V.S Anilkumar.

### **Marks including choice:**

| Unit  | Marks |
|-------|-------|
| 1     | 12    |
| 2     | 13    |
| 3     | 13    |
| 4     | 10    |
| 5     | 8     |
| Total | 56    |



**CORE COURSE XVI : CO-OPERATION IV – CO-OPERATIVE ACCOUNTING  
AND LEGISLATIONS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B16 COM</b>    | <b>4</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After studying the course, student should be able to;

CO 1: prepare and present accounting aspects of cooperative organisations

CO 2: understand the procedure of cooperative auditing

CO 3: Understand the provisions regarding the settlement of disputes in cooperatives

CO 4: Acquaint knowledge on the impact of various other legislations on cooperatives

**Unit I:** Co-operative Accounting – Features- Day book- types-R &D – differences between R & D and Trial balance-Profit and loss account – Balance sheet.

[20 Hours]

**Unit II:** Books and Registers to be maintained by co-operative societies- Audit of co-operative societies–special features of cooperative audit-difference between cooperative audit and Company audit- Director of Co-operative Audit – scope of audit- procedure-audit memorandum- audit fee and exemptions-

[13 Hours]

**Unit III:** Disputes and their settlement – Disputes- meaning- Arbitration-co-operative Arbitration court-powers-Award on dispute- procedure for the settlement of disputes-co-operative Tribunal.- Appeal-revision- review.

[13 Hours]

**Unit IV:** Co-operative unions – meaning- types- circle cooperative union, state cooperative union, NCUI- objectives- constitution- functions .

[10 Hours]

**Unit V:** Other Laws :(important provisions only)Indian Penal code – offence – misappropriation- criminal breach of trust – Forgery .Code of civil procedure – service of summons – properties not liable to attachment-writ– injunction- appeal, revision and review. Indian Evidence Act – oral and documentary evidence - primary and secondary evidence – Kerala Chitties Act- Industrial disputes Act – strike- layoff- lockout. A brief outline of Right to Information Act.

[16 Hours]

**Reference:**

1. Cooperative Societies Laws in Kerala : P.N Mohanan
2. Kerala Co.op Societies Act and Rules : T.S Balan
3. Law for the Co.operatives : R.O Bedi
4. Law and Management of Co. operatives : Trivedi. BB
5. Co.operative Act and Rules : N.A Kareem
6. The Co.operative Societies Act and Rules ,1969 : E.O Thankappan
7. Advanced Accountancy-Vol. I : S.P Jain & K.L Narang

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 13    |
| II    | 10    |
| III   | 10    |
| IV    | 11    |
| V     | 12    |
| Total | 56    |

## ELECTIVE STREAM II – COMPUTER APPLICATION

### CORE COURSE IV : COMPUTER APPLICATION I – INTRODUCTION TO COMPUTERS AND NETWORKS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS                           |
|----------|-------------|----------------|--------|------------------------------------|
| III      | 3B04 COM    | 5(3+2) (T+P)   | 4      | 2 hrs (theory)<br>1 hr (practical) |

#### COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: Understand about computer, peripherals, software and operating system

CO 2: Understand the importance of IT in the modern world and recent development in IT

CO 3: Develop WebPages for business

#### **Unit I:**

**Introduction to Computer** – meaning- definition -types of computers- components- Hardware and Software: Input, Processing, Storage, Output and Communication Hardware–Software: System Software and Application Software – Memory, types - Operating System: WINDOWS, UNIX and LINUX, Versions - Free Software Movement.

[10 Hours]

#### **Unit II:**

**Network and Communications** - Computer Networks – Types of Networks: WAN, MAN, LAN, PAN, CAN - Benefits of Networks - Network Topology –Work Group Computing & Groupware - Telecommuting & Virtual Offices - Network Security – Firewalls - Communication Medium: Wired and Wireless – Generations in Communication.

[15 Hours]

#### **Unit III:**

**Internet** -Working Concepts -Devices, Benefits and Drawbacks - Internet Structure, InternetProtocols: TCP/IP, FTP, HTTP, etc. - IP Address - Domain Name System (DNS) – URL - Web Browsers - WWW Consortium - Search Engines: Types - Academic Search Techniques - Internet Access Methods - Intranet and Extranet. [15 Hours]

#### **Unit IV:**

**Recent Developments in IT-** Virtualisation- Meaning, Types, Uses/Applications - Grid Computing- Meaning, Types, Uses - Cloud Computing- Meaning, Features, Advantages - Green Computing, Web 3.0, Internet of Things(IoT), Artificial Intelligence, Machine Learning, Big Data and Data Analytics (Brief outline only)

[15 Hours]

## Unit V:

**Basic Web Page Development:** HTML Basics- creating HTML document, Building a Web Page-Text and Image formatting-Adding links, Web Development Tools - HTML Table Structure-Basic HTML table tags-Formatting the table, Multimedia Files on a Web Page, Using a Form-Creating formatted lists, Using Frames in a Web Page- structure of HTML document- tags &attributes- Syntax of Tag- Starting and ending tag- tag without end- <Head><Body> text basics- division and paragraphs- heading- physical styles tags- action attributes- lists- <OL>,<UL> and nested list- image tag- attributes <Forms>- <input> tags- controls- text boxes- check boxes- radio buttons- option buttons- submission and reset buttons.

[35 Hours]

**Theory: 3 Hours/ Week**

**Practical: 2 Hours / Week**

### **Recommended practical: HTML**

1. Create websites for an automobile Company/an FMCG Company/an educational institution
2. Create an online application form for admission process / job application

### **References:**

1. Alexis Leon & Mathews Leon: Fundamentals of Information Technology, Vikas Publishing House, New Delhi.
2. Williams & Sawyer: Using Information Technology (6th Edition), Tata McGraw Hill Company.
3. Uyles Black: Computer Networks, Protocols, Standards and Interface, Prentice Hall India Pvt. Ltd.
4. Mary Millhollon: Easy Web Design, PHI, New Delhi.
5. Nick Vandome: Creating Web Pages, Dreamtech Publishers, New Delhi.
6. Mike McGrath: HTML in Easy Steps, Dreamtech Publishers, New Delhi.

### **Marks Including Choice**

| Unit  | Marks |
|-------|-------|
| I     | 6     |
| II    | 8     |
| III   | 6     |
| IV    | 6     |
| V     | 6     |
| Total | 32    |

Maximum mark for theory : 20

Maximum mark for practical : 20

**CORE COURSE VI : COMPUTER APPLICATION II – DATA BASE  
MANAGEMENT SYSTEM**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b>                       |
|-----------------|--------------------|---------------------------|---------------|-------------------------------------------|
| <b>IV</b>       | <b>4B06 COM</b>    | <b>5(3+2) (T+P)</b>       | <b>4</b>      | <b>2 hrs (Theory)<br/>1 hr(Practical)</b> |

**COURSE OUTCOME**

After studying the course, the students shall be able to:

CO 1: familiarize with the concepts of database management

CO 2: handle the database for business firms.

CO 3: develop knowledge in Access and SOL

**Unit I:**

**Database Concepts:** Meaning-Definition - Necessity of a database - Characteristics of database – Character- Field – Record – File-Database- Types of Databases- Entities, Attributes, Keys – DBMS - Advantages of Database Systems –Components of DBMS- Database Structure – Popular Database Softwares (Brief outline only)-Types of DBMS-RDBMS-The NoSQL DBMS- IMDBMS.

[12 Hours]

**Unit II:**

**RDBMS & Relationships in Database :** Data Models - Relational Data Model - RDBMS – Relationships- Types of Relationships - One to One - One to Many - Many to Many – Functional Dependency -Normalization : Meaning , Schemas (1NF, 2NF, 3NF)- Defining Relationships -Referential Integrity Key: Candidate key , Primary key, Foreign Key.

[10 Hours]

**Unit III:**

**Database Administration** – Meaning, Advantages – Data Warehousing- Meaning, importance, Methods Integrating Heterogeneous Databases-Query-driven Approach, Update-driven Approach -Data Warehouse Features-Data Warehouse Applications-Types of Data Warehouse-Data Mining – Meaning, Process.

[13 Hours]

**Unit IV:**

**Introduction to Database Software-** MS Access 2013 : Introduction - Objects in MS Access - Create, Open, and Close a Database - Creating a Data Table - Different ways of Creating Tables - Data Types - The Primary Key - Properties of the Fields - Saving a Table - Closing a Table - Modifying Data Tables - Creating Table Relationships -Editing Relationships. Queries & Forms in Access: Types of Queries - Creating a Query - Saving Queries -Summary Queries - Cross Tab Queries - Action Queries - Forms - The Form Wizard - Editing the Data in a Form - The Form Design View - The Form Design Bar -

The Toolbox - Working with Controls. Reports in Access: The Report Wizard - The Report Design View - The Report Design Bar - The Toolbox - The Preview Window - Grouping and Sorting - Printing a Report.

[30 Hours]

**Unit V:**

**SQL** – Data Definition Language – Data Manipulation Language - statements – Creating tables, Selecting Data, Updating Records, Dropping a table, Querying Database, Aggregating Data, Grouping, Ordering Data - Constraints,–Adding constraints, NOT NULL, UNIQUE, PRIMARY\_KEY - Select statements- DISTINCT – WHERE Clause-conditions based on a range – BETWEEN – Conditions based on pattern matches – LIKE – Aggregate – functions – AVG – sum count – MAX – MIN- group by – order by.

[25 Hours]

**Theory: 3 Hours/ Week**

**Practical: 2 Hours / Week**

**Recommended practical: MS Access 2013 and SQL ( Keep Practical Records)**

Creating and Modifying Data base - Creating Relationship between Tables – Using Queries for Viewing and Modifying Data from Tables -Working with Forms - Managing Controls in Forms -Generating Reports.

**References:**

1. C.J. Date, A.Kannan&S.Swamynathan: An Introduction to Database Systems, Pearson Education
2. Elmasri,,Ramez and Navathe: Fundamentals of Database Systems.
3. Ritchie & Collin: Principles of database systems and Design.
4. Viescas, John L and Conrad Jeff , Microsoft Office Access 2013 Inside Out.
5. Michael Alexander, Richard Kusleika: Access 2013 Bible, Wiley Books.
6. Joan Lambert & Joyce Cox, Microsoft Access 2013 Step by step,
7. Connolly, Thomas and Begg, Carolyn , Learning SQL A step-by-step guide.

**Marks Including Choice**

| Unit  | Marks |
|-------|-------|
| I     | 6     |
| II    | 7     |
| III   | 6     |
| IV    | 7     |
| V     | 6     |
| Total | 32    |

Maximum mark for theory 20

Maximum mark for practical 20

**CORE COURSE XI : COMPUTER APPLICATION III – INFORMATION TECHNOLOGY FOR BUSINESS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b>                           |
|-----------------|--------------------|-----------------------|---------------|-------------------------------------------|
| <b>V</b>        | <b>5B11 COM</b>    | <b>4(2+2) (T+P)</b>   | <b>4</b>      | <b>2 hrs (Theory)<br/>1 hr(Practical)</b> |

**COURSE OUTCOME**

After studying the course, the students shall be able to:

CO 1: Understand the role of information technology in business

CO 2: acquire knowledge in E-Commerce and its application

CO 3: acquire knowledge in information systems and Enterprise Resource Planning

CO 4: manage the office activities with the help of spreadsheet software

**Unit I:**

**E-commerce-** E-commerce, features, advantages,- difference between traditional commerce and E-commerce- components of E-commerce-B2B, B2C, C2C, C2B- process of E-commerce (work flow)- **E-governance-** laws governing E-commerce- IT Act 2000, companies act 2013, GST 2017, FEMA 1999, Consumer Protection Act (brief outline only)- **E-payment systems-** meaning, importance, advantages, types – UPI, IMPS, E-wallets, Aadhar enabled payment system, QR Code payment, NEFT, RTGS, Netbanking, Plastic money (brief outline only)

[15 Hours]

**Unit II:**

**Business Information System-** Information systems – meaning, components, business process- role of information system in business- types of information systems- Transaction Processing System, Office Automation System, Decision Support Systems, Knowledge Management System(brief outline only)- Management Information System- MIS Definition-Need-Benefits-Functions-Objectives-Characteristics-Role of MIS.

[15 Hours]

**Unit III:**

**Enterprise Resource planning-** Concept & definition, features, components, levels of ERP, Benefits of ERP, Modules of ERP, Phases of ERP implementation, Limitations of ERP - Customer relationship Management System (CRM)- Supply Chain Management system (SCM)- Human Resource Management system (HRMS)- accounting information system.

[10 Hours]

**Unit IV:**

**Spreadsheet application for business-** conditional formatting- charts& diagrams- Logical Functions: AND, OR, NOT, IF, IFNOT, COUNT, COUNTIF, TRUE- Text Functions: UPPER, LOWER, LEFT, RIGHT, TRIM, TEXT, LEN, DOLLAR, EXACT; Financial Functions: Depreciation (DB, DDB, VDB), Simple Interest (PMT, NPER,

INTRATE) - Present Value, Net Present Value, Future Value ( PV, NPV, FV) - Internal Rate of Return (IRR, MIRR)- Statistical Functions: Mean, Median, Mode, Standard Deviation, Correlation, Regression- Date & Time Functions: DATE, DATEVALUE, DAY, DAYS360, NOW, TIME, TIMEVALUE, WORKDAY, WEEKDAY, YEAR - Lookup and Reference Functions: HLOOKUP, VLOOKUP, TRANSPOSE, GETPIVOTDATA – PIVOT TABLE –HYPERLINK.

[32 Hours]

**Theory: 2 Hours/ Week**

**Practical: 2 Hours / Week**

**Recommended practical: MS Excel**

1. Conditional Cell Formatting
2. Analysis and presentation of data using charts in Excel
3. Usage of all Excel Functions in specified in syllabus
4. PIVOT TABLE, Regression

**Reference:**

1. James A O'brien, George.M.Marakas& Ramesh Behl, Management Information Systems,McGraw Hill Education,
2. D.P Goyal, Management Information Systems: Managerial Perspectives, Vikas Publishing House,
3. A.K Gupta, Management Information System, S.Chand& Company
4. Alexis Leon, Enterprise Resource Plannning, McGraw Hill Education
5. JyotindraZaveri, Enterprise Resource Planning, Himalaya Publishing House
6. Excel 2013 Bible: John Walkenbach, Wiley.
7. Microsoft Excel 2013: Data Analysis and Business Modeling: Winston, PHI
8. Financial Analysis and Modeling using Excel and VBA: ChandanSengupta, Wiley
9. Patrick Blattner, Louie Utrich. Ken Cook & Timothy Dyck, Special Edition Ms Excel,Prentice Hall India Pvt. Ltd.
10. Brealey.&.MyersIS: Financial.Analysis.With.Excel.-.McGraw.Hill.
11. www.excel-easy.com
12. www.excelmadeeasy.com

**Marks Including Choice**

| Unit  | Marks |
|-------|-------|
| I     | 7     |
| II    | 9     |
| III   | 8     |
| IV    | 8     |
| Total | 32    |

Maximum mark for theory : 20

Maximum mark for practical : 20



**CORE COURSE XVI : COMPUTE APPLICATION IV – ACCOUNTING  
PACKAGES - TALLY**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b>                       |
|-----------------|--------------------|---------------------------|---------------|-------------------------------------------|
| <b>VI</b>       | <b>6B16 COM</b>    | <b>4(2+2) (T+P)</b>       | <b>4</b>      | <b>2 hrs (Theory)<br/>1 hr(Practical)</b> |

**COURSE OUTCOME**

After studying the course, the students shall be able to;

CO 1: acquire knowledge in the accounting package Tally

CO 2: .understand the method of creating accounts and vouchers in tally.

CO 3: able to prepare financial statements by using Tally

CO 4: Help students develop skill in preparing financial statements in Tally.

CO 5: perform treatment of GST and TDS by using Tally

**Unit I**

**Introduction to computerised accounting:** Computerised accounting Vs. Manual accounting- Advantages and limitations of computerised accounting – Tally 9 - Features of Tally – Technological advantages of tally- Tally Screen components-Creation of Company- selecting a company – altering/ modifying company creation details – Deleting a company – F 11 Features – F 12 Configuration.

(16 hrs)

**Unit II**

**Accounts and Vouchers** – Account groups – pre-defined groups – creating single & multiple groups – creation of primary account groups – creating ledger accounts in single & multiple – displaying, altering and deleting account groups and ledgers – Accounting vouchers- pre defined vouchers in tally -entering transactions in accounting vouchers - altering and deleting a voucher entry — Account books -Bank reconciliation statement – Trial balance– Profit and loss account - Balance sheet - Cost categories- cost centers–creating-displaying, altering and deleting cost categories and cost centers--Budgets- Creation, alteration and deletion of budgets.

(20 hrs)

**Unit III**

**Accounts with inventory** – enabling F 11 and F 12 - stock category – stock group – single/multiple creation of stock category and stock group – creation of units of measurement – creating single/multiple stock items – creating - displaying, altering and deleting stock groups, unit of measure, stock items– inventory reports - stock summary.

(18 hrs)

#### **Unit IV**

**Accounting with Tax** – F 11 & F 12 settings for taxation – TDS - ledgers related to TDS – creating TDS voucher types - TDS reports – –GST – GST terminologies -Types of GST – computing GST – ledgers and vouchers pertaining to GST – Ledger Creation - Creation of CGST, Input SGST –Input IGST- GST reports.

(18 hrs)

**Theory – 2 Hours / week.**

**Practical – 2 Hours / week. – Trial Balance, Profit & Loss A/c , Balance Sheet, Cost Centers, Bank reconciliation , Budgets , Stock item and unit of measure creation, TDS & GST**

**Record keeping is compulsory**

#### **References**

**1. Implementing Tally 9 A Comprehensive Guide to Tally 9- A.K. Nadhani & K.K. Nadhani - BPB Publications**

**Marks including choice**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 10    |
| III   | 6     |
| IV    | 6     |
| Total | 32    |

Maximum mark for theory 20

Maximum mark for practical 20

**ELECTIVE STREAM III – FINANCE**

**CORE COURSE IV : FINANCE I – FINANCIAL MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>III</b>      | <b>3B04 COM</b>    | <b>5</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After studying the following chapters, the students shall be able to :

CO 1: understand the concept, importance and techniques of capital budgeting.

CO 2: gain knowledge about sources and uses of working capital and significance of working capital management.

CO 3: explain optimum capital structure, theories of capital structure, distinguish between financial and operating leverage.

CO 4: describe the concept of cost of capital and compute the component cost of capital and weighted average cost of capital.

CO 5: differentiate the types of dividend, explain dividend policy and factors affecting dividend policy

**Unit I**

Financial management- meaning- definition- objectives- time value of money- Economic evaluation of investment projects: Nature of investment decisions – investment evaluation criteria – payback period method -Average rate of return method- - NPV – IRR – capital rationing.

[25 Hours]

**Unit II**

**Working capital management:** Meaning, significance, factors and types of working capital –principles of working capital management- operating cycle method of estimating working capital.

[15 Hours]

**Unit III**

**Capital structure:** Optimum capital structure - Theories of capital structure – NI approach ;NOI approach- traditional theory- MM theory (Theoretical aspects only)  
Leverage: Meaning – Financial, Operating and Combined Leverage (Simple Problems only)

[20 Hours]

**Unit IV**

**Cost of capital:**– Meaning- significance – determination of cost of capital – computation of cost of individual components – cost of debt – preference capital –equity capital-retained earnings-Weighted average cost of capital.

[15 Hours]

## **Unit V**

**Dividend Decision** – Dividend- Meaning – Types of Dividend - Dividend policy – conservative v/s liberal policy – factors determining dividend policy

[15 Hours]

### **References:**

1. Financial Management : M.Y Khan & S.P. Jain
2. Financial Management : Dr. Prasannachandra
3. Financial Management : Ravi M. Kishore
4. Financial Management : Dr. S.N. Maheswari
5. Financial Management : I.M Pandey.
6. Financial Management : M.Y Khan & S.P. Jain
7. Financial Management : Dr. Prasannachandra
8. Financial Management : Ravi M. Kishore
9. Financial Management : Dr. S.N. Maheswari
10. Financial Management : P.V. Khulkarni
11. Financial Management : R.K Sharma & ShasiK.Guptha.

### **Marks including choice:**

| <b>Unit</b>  | <b>Marks</b> |
|--------------|--------------|
| I            | 15           |
| II           | 10           |
| III          | 13           |
| IV           | 10           |
| V            | 8            |
| <b>Total</b> | <b>56</b>    |

## CORE COURSE VI : FINANCE II – INVESTMENT MANAGEMENT

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| IV       | 4B06 COM    | 5              | 4      | 3        |

### COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: understand the concept of investment and risk

CO2: explain the different types of securities and their schemes

CO 3: develop a thorough knowledge about security market, its participants and factors affecting security market

CO 4: conduct fundamental and technical analysis of investments in the security market

CO 5: discuss the application of Portfolio Theory, process of portfolio management and measurement of portfolio performance.

#### **Unit I**

**Investment** – Meaning, Definition- Need – Benefits –Investment alternatives-Investment attributes- Investment v/s speculation- arbitrage- hedging- Role of investment in Economic Development – Factors influencing investment- Different investment avenues – features – Return – Meaning – Types – Risk- Meaning – Sources of Risk.

[15 Hours]

#### **Unit II**

**Securities:** Different types of securities – Equity, Debt, Preference shares, money market instruments, Government securities, derivatives- types- Mutual funds: entities in mutual funds –types of schemes

[15 Hours]

#### **Unit III**

**Securities Market:** Participants-Primary Equity market- methods of raising equity-stock invest- book building-Secondary equity market- procedure for buying and selling securities, types of orders online trading, stock market indices BSE and NSE-Sensex and Nifty-

[20 Hours]

#### **Unit IV:**

**Security Analysis:** Fundamental analysis – Economic, industry and company analysis – Technical analysis – Tools- Charting techniques-(Basic concepts only)

[20 Hours]

#### **Unit V**

**Portfolio Management Process:** Meaning and types of portfolio – Scope and Objectives of Port Folio Management - Portfolio Management Process (Theory only)

[20 Hours]

**Reference:**

1. Investment Analysis & Portfolio Management :Prasanna Chandra, Tata McGraw Hill
2. Investment Management :Saram Harry , Prentice Hall
3. Portfolio Management : Francis &Aricher
4. Portfolio Management : S. Kevin
5. Security Analysis & Portfolio Management : PunithavathyPandyan, VikasPublishing House, Pvt. Ltd)

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 8     |
| II    | 10    |
| III   | 14    |
| IV    | 12    |
| V     | 12    |
| Total | 56    |

## CORE COURSE XI : FINANCE III – GOODS AND SERVICE TAX

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5B11 COM    | 4                 | 4      | 3           |

### COURSE OUTCOME

After studying the course, the students shall be able to,

CO 1: understand the basic concept of GST.

CO 2: Explain how GST is levied and collected.

CO 3: describe IGST, its levy and collection

CO 4: familiarise with the preparation of invoice and filing of return under GST

#### **Unit I:**

Basic concepts-(Salient features , Benefits, GST Network, Taxes subsumed, Why GST)-  
Scope of Supply- important definitions supply analysis (basics)- Necessary elements that  
constitute supply under GST Act- Types of supply concept of supplier and recipient  
under GST Law - Goods under GST Act 2017 (over view)-Activities treated as supply of  
goods as Schedule II of GST Act- Services under GST Act- Activities treated as supply of  
services as per Schedule II of under GST Act

(15 Hours)

#### **Unit II:**

Levy and collection - taxable event under GST- Concept of levy and collection of GST -  
Reverse charge mechanism (Basics)- composite supply, principal supply, mixed supply –  
composition levy and exemption - Provisions relating to composition scheme under GST  
Act, Rules required for opting composition scheme- conditions and restrictions for  
composition levy

(10 Hours)

#### **Unit III**

Time of Supply- Goods- need to determine TOS- terms like supplier, Recipient, Reverse  
charge, Time limit for issue of invoice in respect of goods- section 12- services : section  
13,13(1),13(2) Place of service - Goods - section 10(1) and 10(2) services -section 12(1)  
and 12(2) – problem- Questions

(16 Hours)

#### **Unit IV**

Integrated GST - IGST and taxable event - levy and collection (only section 5(1)  
excluding import) - interstate supplies and intra state supplies (Basic view) central  
Govt.,s power to grant exemption - Sections 6(1) , 6(2),6(3)- Input tax credit- Concept of  
ITC - conditions to be satisfied for taking Irc - Registration - Persons liable for  
registration I section 22(1),(2),(3) and (a)] - persons not liable for registration( Section

23)- Compulsory registration (Section 24)Registration procedure in brief- Provision relating to cancellation of registration Section 29(1)

(15 Hours)

**Unit V**

Tax invoice and Return filing - Provisions and Rules relating to Dr and Cr note- Section 31(1),(2),(3),(4),(5)- Basic journal entries -Accounts and records- Problems questions ( Interstate and intra state) - Return filing - tax payment and refund (an over view) - Provisions relating to furnishing of returns (section 39(1)- Methods of tax payment section 49(1)- Refund basics section 54(1)

(16 Hours)

**Books for Reference:**

Beginners's guide to GST - Dr Vandana Bangra & Dr yogendra Bangara

Taxmann's GST ready reckoner

Indirect tax - Vineeth Sodhani

Indirect tax - Muhammed Rafi Syed

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 12    |
| II    | 8     |
| III   | 12    |
| IV    | 12    |
| V     | 12    |
| Total | 56    |



## CORE COURSE XVI : FINANCE IV – CORPORATE TAX PLANNING

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| VI       | 6B16 COM    | 4                 | 4      | 3           |

### COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: understand the concept of tax planning and determine the tax liability of companies

CO 2: understand the methods of reducing tax liability through proper tax planning

CO 3: take financial and managerial decisions after considering the impact of direct tax laws

#### **Unit I**

Tax planning, Tax management, Tax evasion, Tax avoidance. Corporate tax in India - Types of companies - Residential status of companies and tax incidence - Tax liability and Minimum Alternate Tax- Tax on distributed profits.

[10 Hours]

#### **Unit e II**

Tax planning with reference to setting up of a new business: Locational aspect, nature of business, form of organization –simple problems sole proprietorship vs firm ,firm vs company Tax planning with reference to financial management decision -Capital structure, dividend including deemed dividend and bonus shares - Tax planning with reference to specificmanagement decisions -Make or buy; own or lease; repair or replace - Tax planning with reference to sale of scientific research assets.

[32 Hours]

#### **Unit III**

Tax Planning in respect of managerial remuneration-tax planning with respect to employee’s remuneration –simple problems-Special provisions relating to non-residents - Double taxation relief.

[12 Hours]

#### **Unit IV**

Tax planning with reference to business restructuring – Amalgamation – Demerger-Slump sale-Conversion of sole proprietary concern/partnership firm into company - Transfer of assets between holding and subsidiary companies.

[18 Hours]

**Reference:**

1. Singhania, Vinod K., KapilSinghania and Monica Singhania, “Direct Taxes Planning and Management” ,Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish., and Ravi Gupta, “Corporate Tax Planning and Management” , BharatLaw House, Delhi.
3. Pagare, Dinkar., “Direct Tax Planning and Management” , Sultan Chand and sons,New Delhi.
4. Goyal, S.P, Mehrotra H.C., “Direct Tax planning” ,SahityaBhawan, Agra.
5. Acharya, Shuklendra and M.G. Gurha, “Tax Planning under Direct Taxes” , ModernLaw Publication, Allahabad.
6. Mittal, D.P., “Law of Transfer Pricing” ,Taxmann Publications Pvt. Ltd., New Delhi.
7. Income Tax Reports, Company Law Institute of India Pvt. Ltd., Chennai.
8. Taxman, Taxmann Allied Services Pvt. Ltd., New Delhi.
9. Current Tax Reporter, Jodhpur.

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 20    |
| III   | 10    |
| IV    | 16    |
| Total | 56    |

## ELECTIVE STREAM IV – MARKETING

### CORE COURSE IV : MARKETING I – MARKETING PRINCIPLES

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| III      | 3B04 COM    | 5                 | 4      | 3           |

#### COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: develop awareness about various marketing related terms

CO 2: identify the various marketing decisions

CO 3: understand about the international market scenario

CO 4: enumerate the various marketing channels

CO 4: understand international marketing and recent trends in marketing

**Unit I : Introduction-** Market and Marketing – Meaning- Nature scope and importance of marketing-modern concepts of marketing – marketing functions. Marketing orientations.

(15 Hrs)

**Unit II: Marketing mix:** Marketing mix – meaning- importance- the traditional components and additional components. Product- meaning- product planning and development – product life cycle (PLC) – Product time/ mix- Building brand equity- packing- labeling product positioning.

(18 Hrs)

**Unit III: Pricing-** Meaning and definition- steps in pricing – pricing strategies – types- consumer reactions – factors influencing consumer reactions. Pricing Methods Initiating and responding to price changes.

(17 Hrs)

**Unit IV: Channels of distribution-** Meaning and definition – Physical distribution – middlemen types-functions of middlemen- factors to be considered in selecting channels – modern channels of marketing – telemarketing - internet marketing- net work marketing customer relationship marketing. Logistics management. Channel management strategies.

(20 Hrs)

**Unit V: International marketing management-** .introduction, nature and concepts, approaches to international marketing, entry strategies, product pricing, promotion and branding policies in international marketing, recent trends in marketing: E marketing, Green Marketing, Mobile Marketing, Relationship Marketing.

(20 hrs)

**Reference:**

1. Kotler, Keller, Marketing Management, Pearson Publications
2. Fundamentals of marketing - William Stanton
3. Marketing Management - VS Ramaswamy & S Namakumari
4. Marketing Management - Rajan Saxena
5. Marketing Management - Sherlakar .S.A
6. Marketing Management - Raman B.S
7. Principles of Marketing - Philip Kotler

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 8     |
| II    | 10    |
| III   | 14    |
| IV    | 14    |
| V     | 10    |
| Total | 56    |

## CORE COURSE VI : MARKETING II – CONSUMER BEHAVIOUR

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| IV       | 4B06 COM    | 5                 | 4      | 3           |

### COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: understand the concept of consumer behaviour

CO 2: describe determinants of consumer behaviour

CO 3: Explain the consumer decision making process

CO 4: describe concept of consumer satisfaction

#### **Unit I**

**Introduction to Consumer Behaviour-** A managerial & consumer perspective; Need for studying consumer behaviour- Applications of consumer behaviour knowledge; current trends in Consumer behaviour; Market segmentation & consumer behaviour

[12 hours]

#### **Unit II**

**Individual determinants of Consumer behaviour:** Consumer needs & motivation; personality and self concept; consumer perception; learning & memory; nature of consumer attitudes; Consumer attitude formation and change

[14 hours]

#### **Unit e III**

**Environmental determinants of consumer behaviour:** Family influences; the influence of culture; subculture & cross cultural influences; group dynamics and consumer reference groups; social class & consumer behaviour.

[20 hours]

#### **Unit IV**

**Consumer decision making process-** types of buying- straight buy- Modified re-buy- New task buying types of products & decision making process- conveyance goods, shopping goods specialty goods Steps in decision making process - problem recognition- need, description, information – search- evaluation of alternatives – selection criteria- buying- post purchase behaviour.

[24 hours]

#### **Unit V**

**Concept of Consumer Satisfaction;** Working towards enhancing consumer satisfaction; sources of consumer dissatisfaction; dealing with consumer complaint. Concept of consumerism; consumerism in India; the Indian consumer; Reasons for growth of consumerism in India-Relevance of Consumer Protection Act, 1986.

[20 hours]

## **References**

1. Consumer behaviour :Hawkings, Best Mc.Graw Hill International .
2. Consumer behaviour : Leon. G Schiffman
3. Consumer behaviour- Concepts &Applications :LoudsonDalla
4. Principles of Marketing : Philip Kotler
5. Consumer Behaviour In Marketing Strategy : John .A. Howard.
6. Consumer Behaviour In India :AnithaGhatale
7. Problems of Consumer Behaviour in India : A. Sarkar
8. Consumer Behaviour :Sontakki

## **Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 8     |
| II    | 10    |
| III   | 14    |
| IV    | 14    |
| V     | 10    |
| Total | 56    |

## CORE COURSE XI : MARKETING III – PROMOTION MANAGEMENT

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5B11 COM    | 4                 | 4      | 3           |

### COURSE OUTCOME

- CO 1: understand the term promotion and its importance  
CO 2: enumerate various methods of sales promotion and its effects  
CO 3: familiarise with the theory and practice of advertisement  
CO 4: Prepare advertisement copy

#### **Unit 1.**

**Promotion:** Meaning and definition – importance of sales promotion- promotion mix tools-factors deciding promotion mix.

[15 Hours]

#### **Unit II.**

**Advertising** – meaning, objectives & importance - advantages – advertising effects – economic and social – advertising agency-advertising budgets - media – types – print - radio- TV & others – advantages & disadvantages.

[18 Hours]

#### **Unit III.**

**Personnel Selling:** Meaning- importance- principles of personal selling- steps in personal selling process

[12 Hours]

#### **Unit IV**

**Sales promotion and publicity:** Objectives – purpose- dealer promotion- consumer promotion methods and techniques – publicity- meaning, scope and objectives elements of publicity- public relations- press relation.

[18 Hours]

#### **Unit V**

**Advertisement Copy:** Preparation of advertisement copy- project work

[9 Hours]

#### **Reference:**

1. Advertising : Morris James .S
2. Advertising theory &practice :Sandya C.H and Trybanger
3. Marketing Practices and Marketing Strategy : B. Rasheed Ajay.
4. Foundations of Advertising Theory &Practice :Chunnawalia& K.C Sethia
5. Sales Promotion : Tony Puelus
6. Advertisement Management :Aaker Paul.

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 10    |
| III   | 12    |
| IV    | 14    |
| V     | 10    |
| Total | 56    |



## CORE COURSE XVI : MARKETING IV – MARKET RESEARCH

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| VI       | 6B16 COM    | 4                 | 4      | 3           |

### COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: .understand the concept market research , its importance and type.

CO 2; Explain the process involved in the marketing research

CO 3: appraise the various methods of collecting data and analysis

CO 4: understand the methods of writing report and prepare report by themselves.

#### **Unit I**

**Marketing Research: Introduction** – Meaning - definition- importance- nature and scope- objectives- Marketing Information System- need, importance and types- market research Vs marketing research limitations.

[12 Hours]

#### **Unit II**

**Marketing Research Process:** Problem identification – definition – developing a research proposal – research design – meaning and importance – steps in marketing research process.

[12 Hours]

#### **Unit III**

**Sources of Data:** Primary and secondary data- Relative advantages and disadvantages; methods of collection of primary data; construction of questionnaire and interview schedule; scaling and measurement; Sampling designs and sample size- decisions; organizing data collection & field force - collection methods- observations questionnaire-interview schedule – pilot survey and online survey.

[18 Hours]

#### **Unit IV**

**Data analysis & interpretation:** Need and importance –Editing, coding and tabulation of data- tools - parametric and non- parametric tests. –; techniques of data analysis; testing of hypothesis; tests of significance; analysis of associations; analysis of experiments; interpretation of data.

[20 hours]

#### **Unit V**

**Report Writing and Presentation:** Role & types of report; content of report; principles of report preparation; Presentation & Communication.

[10 Hours]

**Suggested assignment:** Preparation of a project report based on the market survey of a consumer product.

**References:**

1. Marketing Research : David. J Lucle& Ronald S. Robin
2. Marketing Research : Measurement & methods – Donald. S Tull& Dell Hoclis
3. Marketing Research Principles: Applications and cases - Sharma D.D
- 4 Marketing Research :Geol .B.S
5. Market Research : Paul Hague
6. Statistical Methods : S.P Guptha
7. Business Statistics : B.N Gupta
8. Research Methodology : O.R Krishnaswamy.
9. Research Methodology : C.R. Kothari

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 10    |
| III   | 12    |
| IV    | 14    |
| V     | 10    |
| Total | 56    |

**PART B**  
**B.COM GENERAL AWARENESS COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**( 2019 ADMISSION ONWARDS )**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                               | <b>SEMESTER</b> | <b>HOURS/ WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|--------------------|---------------------------------------------------|-----------------|--------------------|---------------|-----------------|
| 1A11<br>COM        | Business Statistics and<br>Basic Numerical Skills | I               | 6                  | 4             | 3               |
| 3A12<br>COM        | Entrepreneurship<br>Development                   | III             | 5                  | 4             | 3               |
| 4A13<br>COM        | General Informatics Skills<br>(T+P)               | IV              | 5(3+2)             | 4             | 2               |
| 4A14<br>COM        | Environmental Studies and<br>Disaster Management  | IV              | 5                  | 4             | 3               |

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|-------------------|------------------|--------------|
| EXTERNAL          | 4                | 40*          |
| INTERNAL          | 1                | 10           |

\* 20 marks for theory and 20 marks for practical for courses having practical

**CONTINUOUS INTERNAL ASSESSMENT**

| <b>COMPONENT</b>                       | <b>WEIGHTAGE</b> | <b>MARKS</b> | <b>REMARKS</b>                                                                                          |
|----------------------------------------|------------------|--------------|---------------------------------------------------------------------------------------------------------|
| COMPONENT 1<br>Test paper              | 3                | 6            | Minimum two test papers and mark should be awarded on the basis of average mark obtained by the student |
| COMPONENT 2<br>Assignment/<br>Seminar/ | 2                | 4            | Department should keep a record of the work done                                                        |

Internal mark for test papers should be given as per the following criteria;

| <b>Average mark obtained in the test paper</b> | <b>Percentage of internal mark</b> |
|------------------------------------------------|------------------------------------|
| 80% and above                                  | 100%                               |
| 60% to 79%                                     | 80%                                |
| 40% to 59%                                     | 60%                                |
| 20 % to 39%                                    | 40%                                |
| Below 20%                                      | 20%                                |

**GENERAL AWARENESS COURSE I : BUSINESS STATISTICS AND BASIC NUMERICAL SKILLS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>I</b>        | <b>1AII COM</b>    | <b>6</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOME**

After studying this course, students shall be able to;

CO 1: Define statistics and explain its importance, scope, applications and limitations

CO 2: Understand the basic knowledge of statistical techniques, which are applicable to business.

CO 3: understand basic concepts in mathematics, which are applied in the managerial decision making.

CO 4: Develop the basic mathematical skill needed for analyzing numeric problems related to business

**Unit I: Introduction to statistics-** Meaning, Definition, functions, importance and limitations- Statistical investigation- stages- sources of data- primary- secondary – Classification and tabulation- - Construction of frequency distributions.

(12 Hrs)

**Unit II: Measures of Central Tendency** – Meaning-requisites of good average- Arithmetic Mean – simple and weighted -Median - Mode - Geometric and Harmonic Mean (algebraic method only). **Measures of dispersion-** range, quartile deviation, mean deviation, standard deviation -Skewness

(28 Hrs)

**Unit III: Index Numbers** – meaning- definition- uses-problems in the construction of index numbers- types of index numbers- methods of construction of index numbers- Laspeyers', Paasche's, Fisher's, and Kelly's Methods- Test of adequacy- time reversal and factor reversal only.

(16 Hrs)

**Unit IV: Matrix Algebra** :Introduction –Definition –Types of Matrix-Matrix operations- Addition and subtraction- Matrix multiplication- Transpose of a matrix-Determinants of a square matrix-determinants of order two and order three-Inverse of a matrix-Solving simultaneous linear equations – Crammer's rule-Rank of a matrix.

(30 Hrs)

**Unit V : Set theory and set operations-** simple application of Venn diagram- Truth table and its applications - Linear simultaneous equations (up to 3 variables only)- Quadratic equations-Solution of linear inequalities (by geometric method only)- ratios and proportions.

(22 Hrs)

**Reference:**

1. Raymond Barnett, Michael Ziegler - Essentials of College Mathematics for Business, Economics, Life Sciences and Social Sciences
2. Sancheti and V.K.Kapoor - Business Mathematics
3. M.Raghavachari - Mathematics for Management
4. Dr. P.R. Vittal - Business Maths & Statistics
5. Sundaresan and Jayaseelan - An Introduction to Business Mathematics and Statistical Methods.
6. A K Arte & R V Prabhakar - A Text Book of Business Mathematics.
7. Sanchethi and Kapoor- Business Mathematics
8. Gupta S.P- Statistical Methods
9. Navaneethan P- Business Mathematics
10. R.S.N. Pillai, Mrs. Bhagavathi – Statistics
11. P.R. Vittal - Business Mathematics and Statistics

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| 1     | 5     |
| 2     | 15    |
| 3     | 10    |
| 4     | 13    |
| 5     | 13    |
| Total | 56    |

**GENERAL AWARENESS COURSE II : ENTREPRENEURSHIP  
DEVELOPMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>III</b>      | <b>3A12 COM</b>    | <b>5</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After the completion of the course the learners should be able to

CO 1: Identify the characteristics of an entrepreneur

CO 2: describe the importance of entrepreneurs in the economic developmet of a nation

CO 3: identify the different types of entrepreneurs

CO 4: to strengthen their skill and quality as an entrepreneur

**Unit I :**

Concept of Entrepreneurship- meaning- definition- importance Functions- Distinction between entrepreneur and a manager. Types of entrepreneurs- Student entrepreneurship----concept and importance. Role of first generation entrepreneurs. Intrapreneur- Practices to entrepreneurship development Concept of women entrepreneurship-problems of women entrepreneurs. Assistance available to women entrepreneurs

(18 Hrs)

**Unit II :**

Factors affecting Entrepreneurial Growth-motives influencing entrepreneurs. Rural entrepreneurship-role of entrepreneur in Economic development. Social entrepreneurship. Factors affecting Entrepreneurial Growth-Rural entrepreneurship-role of entrepreneur in Economic development.

(18 Hrs)

**Unit III:**

Entrepreneurial motivation      Motivating factors      Achievement      Motivation  
Entrepreneurial competencies Developing competencies. Institutional efforts and role of Government in developing entrepreneurship- Entrepreneurship Development Programme (EDP) - Need- Objectives-Course content and curriculum of EDP. Phases of EDP, Stories of successful entrepreneurs.

(16 Hrs)

**Unit IV:**

Launching of new enterprise. Sources of business ideas. Setting up of new business. Micro, Small & Medium Enterprises- MSMED Act 2006 - Characteristics- Objectives Importance MSMEs as a seed bed of entrepreneurship. Entrepreneurship incubators - Problems and prospects of MSMEs- Incentives and subsidies- Taxation benefits to MSMEs. Institutional finance to entrepreneurs' .project: meaning and features, project

analysis and feasibility study. Contents of project report. Preparation of Project Report for a Micro enterprise.

(20 hrs)

### **Unit V**

Support systems for entrepreneurs and MSMEs: Industries Board- State Small Industries Development Corporations- MSME Institute-DICs- Industrial Estates-Specialized institutions-Technical Consultancy Organizations lead bank schemes.Loans and advances available for entrepreneurs, schemes of financial institutions,(latest data} startups, role of universities and colleges in developing entrepreneurship. Role of NGOs.entrepreneurial ecosystem in Kerala.

(18 Hrs)

### **Reference:**

1. Entrepreneurial Development : P. Saravanavel
2. Entrepreneurial Development :C. B Gupta and N.P Sreenivasan
3. A complete Guide to Successful Entrepreneurship; G.N. Pandey
4. Business and Society Davis Keith and Williams C. Fredarick
5. Entrepreneurship : R.V. Badi& N V Badi
6. Entrepreneurship Development : S.S. Khanka
7. Entrepreneurship : Robert D Hisrich and Michael P Peters
8. Project Evaluation and Management :Singh and Mahadev
9. MSME Act 2006

### **Marks including choice:**

| Unit  | Marks |
|-------|-------|
| 1     | 10    |
| 2     | 10    |
| 3     | 12    |
| 4     | 14    |
| 5     | 10    |
| Total | 56    |

### **GENERAL AWARENESS COURSE III : GENERAL INFORMATICS SKILLS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b>  | <b>EXAM<br/>HRS</b>             |
|-----------------|--------------------|---------------------------|----------------|---------------------------------|
| <b>IV</b>       | <b>4A13 COM</b>    | <b>5(3+2) (T+P)</b>       | <b>4((3+1)</b> | <b>Theory 2<br/>Practical 1</b> |

#### **COURSE OUTCOME**

After studying the course, the students shall be able to;

- CO 1: Explain the Fundamentals of Computers the use of computers in day to day application
- CO 2: Up to date and expand the basic informatics skills necessary in the emerging knowledge society
- CO 3: Effectively utilize the digital knowledge resources for their studies
- CO 4: State the areas where IT can be used effectively
- CO 5: Perform accounting by using the appropriate accounting packages

#### **Unit I**

Overview of information Technology. Features of Modern Personal Computer and Peripherals – Computer Networks – Types of Networks – Components of Networks – Topology – Internet – Uses of Internet.

[10 Hours]

#### **Unit II**

Social Informatics: IT and society – issues and concerns -Digital divide – Cyber ethics – Cybercrimes – Cyber Laws – Cyber addictions- Information over Load – Health Issues – Guide lines for Proper Usage of computers and internet. E Waste.

[10 Hours]

#### **Unit III**

IT Applications :E Governance– overview of IT Application in Medicine, Health care, Business and Commerce.– Industry.

[10 Hours]

#### **Unit IV**

Knowledge Skills for Higher Education : Data, Information and Knowledge - Knowledge Management -Internet as a knowledge repository - Academic search techniques - Case study of academic websites – Basic concepts of IPR – Copyrights and Patents - Introduction to use of IT in teaching and learning - Case study of educational software - Academic Service – INFLIBNET – NICENET - BRENT.

(12 Hours)

#### **Unit V**

Programmes for Office Management: MS word – window concepts – Menus, tiles, Edit, View, tools, tables, Mail Merge. MS Excel – Spread sheet – operators - Arithmetic – Relation Functions –Formulae – Payroll Preparation. MS Power point - creating slides and presentations, adding media clips and charts, special effects, setting slid timings



[24 Hours]

**Unit VI**

Computerized Accounting (Using Accounting Software) Meaning, features and advantages of computerised Accounting – Company Creation- Accounts Information- Ledger – Groups– Cost Centers – Accounts with inventory- stock item and stock Group creation – voucher – types - entry – P/L A/c, B/S, Bank Reconciliation.

[24 Hours]

**Reference.**

- 1.V. Rajaraman : Introduction to Information Technology. PrenticeHall
2. Technology in Action : Pearson.
3. Alexis Leon & Mathews Leon : Computer Today, Leon Vikas.
4. A.K.Nandani& K.K Nandani : Tally 6.3
5. V.K.Jain : Computer Fundamentals
6. Vijay Kumar Khurana : Management of Information Technology - B.Jolly&K.S.Jolly; SunithaPrakasan
7. Rechard Peterson Negus: Linux Bble, Wiley India Private Limited.
8. Mike Mc Grath, Linux in Easy steps, Dream Tech Press New Delhi

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 4     |
| II    | 6     |
| III   | 6     |
| IV    | 8     |
| V     | 4     |
| VI    | 4     |
| Total | 32    |

Maximum mark for theory 20

Maximum mark for practical 20

**GENERAL AWARENESS COURSE IV : ENVIRONMENTAL STUDIES AND  
DISASTER MANAGEMENT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>IV</b>       | <b>4A14 COM</b>    | <b>5</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After studying the course, the students shall be able to;

CO 1: Understand the components of environment and need for the protection of environment

CO 2: Understand the effect of pollution on environment and the ways of protecting the environment

CO 3: Explain the social issues relating to environmental pollution

CO 4: Clearly understand the various environmental hazards and the ways of managing disaster.

**Unit I :**

Brief discussion on the components of the Environment, Scope and importance of Environmental studies- Environmental problems associated with the exploitation of natural resources- Environmental protection, major environmental movements in India. Environment protection Act 1986- impacts on companies, violation and penalties, Environment Impact Assessment, Environment Protection related compliances for start-up manufacturing enterprises.

(15 hours)

**Unit II :**

Environmental Pollution- types, causes, effects- Bhopal gas tragedy, A brief discussion on - Global Warming- Climate Change- Ozone Depletion,-Acid Rain, Standards and control measures required by industries in compliance to The Air (Prevention of Pollution and Control) Act 1989, Water Pollution, importance of water pollution control and steps required to be taken by industries eg; Sewage treatment plant, water treatment plant etc. Relevance of environment legislation to business enterprises, Legislation vs. Social obligation of the business

(20 hours)

**Unit III:**

Social issues and environment- unsustainable and sustainable development, urban problems related to energy, water conservation, water harvesting, resettlement and rehabilitation of people, environmental ethics, waste land reclamations, consumerism and waste products

(15 hours)

**Unit IV :**

Environmental hazards and disasters-Meaning, types-natural hazards and disaster-Planetary hazards/Disasters: (a) Endogenous Hazards: volcanic eruption-Earth quakes-Landslides (b)Exogenous Hazards :infrequent events-cyclones-lightning-hailstorms. Cumulative atmospheric hazards/disasters: floods-Droughts-Heat waves. Extra planetary hazards/disasters. Man induced hazards and disasters: physical hazards/disaster-soil erosion-chemical hazards/disaster.

(20 Hours)

**Unit V:**

Phases of disaster management-Stages:1)pre-disaster stage(preparedness),2)Emergency stage, 3)post disaster stage .Institutional framework of disaster management-disaster mitigation institutions, education on disaster, community involvement in disaster management, role of media.

(20 Hours)

**Reference:**

- 1.Environmental Science : Cunnigham TMH
- 2.Environmental Studies: AK De & A K De,New Age International
- 3.Environmental management : n K Oberoi,EXCEL BOOKS
- 4.Environmental pollution ControlEngineering : C S Rao,New Age International
- 5.Ecosystem Principles & Sustainable Agriculture :Sithampanathan,Scitech
- 6.DisasterManagemen: R B Singh,RawatPublications,New Delhi
- 7.DisasterManagement,H K Gupta, University Press,India
- 8.An Overview on Natural and Man Made Disaster & their 44 Reduction:R K Bhandani, CSIR New Delhi.

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 13    |
| III   | 10    |
| IV    | 13    |
| V     | 10    |
| Total | 56    |

**PART C**

**B.COM COMPLEMENTARY ELECTIVE COURSES**

**WORK AND CREDIT DISTRIBUTION**

**( 2019 ADMISSION ONWARDS )**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                               | <b>SEMESTER</b> | <b>HOURS/ WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> |
|--------------------|---------------------------------------------------|-----------------|--------------------|---------------|-------------------|
| 2C01<br>COM        | Quantitative Techniques<br>For Business Decisions | II              | 6                  | 4             | 3                 |
| 3C02<br>COM        | Business Regulatory<br>Framework                  | III             | 4                  | 4             | 3                 |
| 3C03<br>COM        | Business Economics                                | III             | 5                  | 4             | 3                 |
| 4C04<br>COM        | Corporate Law and<br>Business Regulations         | IV              | 4                  | 4             | 3                 |

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|-------------------|------------------|--------------|
| EXTERNAL          | 4                | 40           |
| INTERNAL          | 1                | 10           |

**CONTINUOUS INTERNAL ASSESSMENT**

| <b>COMPONENT</b>                      | <b>WEIGHTAGE</b> | <b>MARKS</b> | <b>REMARKS</b>                                                                                          |
|---------------------------------------|------------------|--------------|---------------------------------------------------------------------------------------------------------|
| COMPONENT 1<br>Test paper             | 3                | 6            | Minimum two test papers and mark should be awarded on the basis of average mark obtained by the student |
| COMPONENT 2<br>Assignment/<br>Seminar | 2                | 4            | Department should keep a record of the work done                                                        |

Internal mark for test papers should be given as per the following criteria;

| <b>Average mark obtained in the test paper</b> | <b>Percentage of internal mark</b> |
|------------------------------------------------|------------------------------------|
| 80% and above                                  | 100%                               |
| 60% to 79%                                     | 80%                                |
| 40% to 59%                                     | 60%                                |
| 20 % to 39%                                    | 40%                                |
| Below 20%                                      | 20%                                |

**COMPLEMENTARY COURSE I: QUANTITATIVE TECHNIQUE FOR  
BUSINESS DECISIONS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>II</b>       | <b>2C01 COM</b>    | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After studying the course, students should be able to,

CO 1:- Acquaint with the basic statistical tools, which can be applied in business and economic situations.

CO 2:- Develop knowledge in quantitative techniques, which help in tackling various problems for modern business.

CO 3:- Understand and solve problems in probability, correlation and regression.

CO 4:- Understand the effect of trend and seasonal variations on business.

CO 5:- Familiarize with the testing of hypothesis.

**Unit I**

**Correlation-** Meaning-Classification- Methods- Scatter Diagram- Karl Pearson's Coefficient of Correlation- Spearman's Rank Correlation.

[15 Hours]

**Unit II**

**Regression Analysis:** Meaning And Definition- Types of Regressions-Regression Lines- Regression Equations.

[20 Hours]

**Unit III**

**Time Series Analysis:** Meaning-Components of Time Series-Methods of Measures of Trend- Moving Average Methods, Methods of Least Squares.

[23 Hours]

**Unit IV**

**Statistical Inference:** Testing Of Hypothesis-Meaning-Characteristics- Null Hypothesis and Alternative Hypothesis-Type I and Type II Errors –Procedure For Hypothesis Testing- Level Of Significance-Two Tailed and One Tailed Test- Non Parametric Test- Chi Square Only (Simple Problems) –Parametric Test- Z Test- Meaning and Assumptions only- T test- Meaning-Assumptions- One Sample T test only.

[25 Hours]

## **Unit V**

**Probability-** Meaning and Definition- Important Terms- Theorems of Probability- Addition and Multiplication Theorem-Conditional Probability- Bayes Theorems- Permutation and Combination. Probability Distributions- Binomial Distribution-Poisson Distribution and Normal Distribution. (Simple Problems Only).

[25 Hours]

### **References:**

1. C .R.Kothari: Quantitative Techniques
2. S.P.Gupta: Statistical Methods, Sulthan Chand And Sons, New Delhi 2
3. C B Gupta & Vijay Gupta: An Introduction To Statistical Methods, Ane Books Pvt Ltd
4. P. N. Arora& Mrs.S.Arora: Quantitative Aptitude vol I & II, S Chand & Co Ltd, New Delhi
5. S.L.Aggarwal & S L Bhardwaj: Fundamentals of Business Statistics, Kalyani Publishers
6. P K Gupta & D S Hira: Operations Research, S Chand & Co Ltd, New Delhi
7. L R Potti: Operations Research, Yamuna Publications,Tvm

### **Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 12    |
| II    | 10    |
| III   | 12    |
| IV    | 12    |
| V     | 10    |
| Total | 56    |

## **COMPLEMENTARY COURSE II: BUSINESS REGULATORY FRAMEWORK**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>III</b>      | <b>3C02 COM</b>    | <b>4</b>                  | <b>4</b>      | <b>3</b>            |

### **COURSE OUTCOME**

After studying this course, the students shall be able to,

CO 1: Understand the nature of contracts and the essential elements of a valid contract

CO 2: Explain the difference between a valid contract and a void contract

CO 3: Understand the breach of contract and remedies available for a breach of contract

CO 4: Understand various kinds of special contracts like indemnity, guarantee, bailment and agency contract

#### **Unit I:**

Indian Contract Act – Contract –meaning- types –Essentials of valid contract –Offer – types of offer – essential elements – Revocation-- Acceptance – essentials – Communication of offer and acceptance- Consideration – Essentials – stranger to the consideration- exceptions to consideration-Capacity to contract- minor-unsound mind - persons disqualified by law.

(15 Hrs)

#### **Unit II:**

Free consent – meaning – Coercion – Undue influence – Misrepresentation – Fraud – Mistake (Basic concepts of these 5 elements) – Legality of object – Contracts expressly declared to be void- wagering contract-contingent contract.

(12 Hrs)

#### **Unit III:**

Performance of Contract – Modes of performance-Tender and its essentials- Appropriation of payments- Discharge of Contract- ways of discharging contract- Breach of Contract-Remedies of breach of contract – Quasi contract.

(15 Hrs)

#### **Unit IV:**

Special Contracts – Indemnity contracts – Guarantee contract – Differences – Kinds of Guarantee - Rights, duties and discharge of surety – Contract of Agency – Creation and termination of Agency.

( 14 Hrs)

**Unit V:**

Bailment and Pledge – Essentials – Kinds of Bailment – Rights and duties of Bailer and Bailee – Sale of goods Act – sale and agreement to sell – Conditions and Warranties – Express and Implied – Doctrine of Caveat emptor – Unpaid seller – rights and duties ( As per Transfer of Properties Act )

(16 Hrs)

**Books for Reference:**

1. Mercantile Law, Chowla and Garge
2. Mercantile Law – N D Kapoor
3. Business and Corporate Law – L R Potti
4. Mercantile Law – R S N Pillai and Bhagavathy

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 14    |
| II    | 10    |
| III   | 12    |
| IV    | 10    |
| V     | 10    |
| Total | 56    |



### COMPLEMENTARY COURSE III: BUSINESS ECONOMICS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| III      | 3C03 COM    | 5              | 4      | 3        |

#### COURSE OUTCOME

After studying this course, students shall be able to;

CO 1: Understand the concept of economics and its use in business

CO 2: Understand the concept of demand, elasticity and demand forecasting

CO 3: Understand production function and law of production

CO 4: Understand the methods of determining price of a product

CO 5: Explain the methods of computing national income.

CO 6: Conceive the developmental issues of Indian economy and Kerala economy

#### **Unit I:**

Managerial Economics:- Economics- meaning- definitions -Differences between micro economics and macro economics - Managerial economics— - Definition and characteristics – Nature and Scope – characteristics- distinction between managerial economics and general economics - Relationship of managerial economics with other disciplines – role and responsibility of managerial economist.

(18 Hrs)

#### **Unit II:**

Demand estimation- demand- Law of demand-demand curve- exceptions of law of demand-elasticity of demand – price – income- advertisement- cross- uses- measurement- Law of diminishing marginal utility. Supply- determinants- Law of supply - Demand forecasting – short term and long term- methods of forecasting- forecasting demand for new product.

(20 Hrs)

#### **Unit III:**

Production and production function- Cobb Douglas production function- law of production – law of diminishing returns – law of returns to scale - isoquants, isocost, optimum combination of inputs, economies and diseconomies of scale.

(15 Hrs)

#### **Unit IV:**

Pricing and pricing policies- objectives of pricing - factors affecting pricing policy- types of pricing- cost plus pricing – marginal cost pricing – going rate pricing – BEP pricing – product line pricing – pricing of a new product.

(15 Hrs)

**Unit V:** National Income –concept and meaning - Computation of NI- Methods and Difficulties - Economy’s income and expenditure – Measurement of GDP –components of GDP – Real versus nominal GDP –GDP deflator – monetary and fiscal policies- pros and cons –Demonetization –meaning – objects and impact. Development issues of Indian economy- Poverty, Inequality, Unemployment and Black money–Features of Kerala economy-Kerala model of development- decentralized planning in Kerala.

(22 Hrs)

**Reference:**

1. R.L. Varshney and K.L. Maheswari, Managerial Economics
2. Ahuja. HL; Business Economics, S. Chand & co.
3. D.N. Dwivedi, Managerial Economics
4. Dr. S. Sankaran, Managerial Economics
5. DM Mithani: Business Economics
6. Seth M L Text Book of Economic Theory
7. K K Dewett: Economic Theory
8. Dutt & Sundaram: Indian Economy
9. Petersen & "Lewis: Managerial Economics
10. Mote V L peul. S & Gupta G S: Managerial Economics
11. H. Craig Petersen & W. Cris lewis: Managerial Economics
12. Dr. P.N. Reddy and H.R, Appanaiah : Essentials of Business Economics
13. Barry Keating and J. Holton Wilson: Managerial Economics
14. Dwivedi, D.N: Microeconomics: Theory and Applications,
15. N. Gregory Mankiw, ‘Macroeconomics’
16. B A Prakash, Kerala’s Economic Development Emerging Issues and Challenges

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 10    |
| II    | 12    |
| III   | 12    |
| IV    | 10    |
| V     | 12    |
| Total | 56    |

**COMPLEMENTARY COURSE IV: CORPORATE LAW AND BUSINESS  
REGULATIONS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>IV</b>       | <b>4C04 COM</b>    | <b>4</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

After studying this course, students should be able to;

CO 1: Understand the provisions of Companies Act 2013

CO2: Describe the procedure for the formation, registration and winding up of the company

CO 3: Explain various kinds of companies and the authorities of companies in India

CO 4: Understand the management and administration of Companies

**Unit I:**

Companies Act 2013- Definition- Features- Classification- Authorities of Company Law- Central Govt. - Company Law Board- SEBI- Liquidator- Court- Registrar-Tribunal.

(12 Hrs)

**Unit II:**

Formation of Company- Promotion- Stages-Types of promoters-Registration & Incorporation- raising of capital- Commencement of Business- Lifting Corporate Veil.

(13 Hrs)

**Unit III:**

Memorandum of Association- Contents- Articles of Association- Contents- Difference- Table A- Alterations- Doctrine of Ultravires- Constructive notice & indoor management- Prospectus- types-Contents-- Misstatement in prospectus.

( 15Hrs)

**Unit IV:**

Members of Company- Acquiring membership-Termination of membership-Rights-Duties- Obligations- Directors- Appointment-Qualifications & Disqualifications- Retirement & Removal of Directors.

(12 Hrs)

**Unit V:**

Company meeting- General Meeting- Board Meeting- Class Meeting- Essential of valid Meetings- chairman-Motion- Resolution- types of resolutions-Methods of voting.

(10 Hrs)

**Unit VI:**

Winding up- Modes of Winding Up- Winding up by the Tribunal- provisions-voluntary winding up – conditions and provisions - Liquidator- Rights , powers & Duties of Liquidator- effects of winding up.

(10 Hrs)

**Books for Reference:**

1. Mercantile Law, M C Shukla
2. Business Law, R S N Pillai, Bhagavathi
3. Company Law P PScogna
4. Business & Corporate Law, L R Potti

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 8     |
| II    | 8     |
| III   | 10    |
| IV    | 10    |
| V     | 10    |
| VI    | 10    |
| Total | 56    |

**PART D**

**B.COM GENERIC ELECTIVE COURSES**

**WORK AND CREDIT DISTRIBUTION**

**(2019 ADMISSION ONWARDS)**

**OFFERED TO STUDENTS OF OTHER DEPARTMENTS**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>           | <b>SEMESTER</b> | <b>HOURS/ WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> |
|--------------------|-------------------------------|-----------------|--------------------|---------------|-------------------|
| 5D01 COM           | Basic Accounting              | V               | 2                  | 2             | 2                 |
| 5D02 COM           | E-Commerce                    | V               | 2                  | 2             | 2                 |
| 5D03 COM           | Principles of Management      | V               | 2                  | 2             | 2                 |
| 5D04 COM           | Insurance and Risk Management | V               | 2                  | 2             | 2                 |
| 5D05 COM           | Financial Services            | V               | 2                  | 2             | 2                 |

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> | <b>MARKS</b> |
|-------------------|------------------|--------------|
| EXTERNAL          | 4                | 20           |
| INTERNAL          | 1                | 5            |

**INTERNAL ASSESSMENT**

| <b>COMPONENT</b>                  | <b>WEIGHTAGE</b> | <b>MARKS</b> | <b>REMARKS</b> |
|-----------------------------------|------------------|--------------|----------------|
| COMPONENT 1<br>Test paper         | 3                | 3            |                |
| COMPONENT 2<br>Assignment/seminar | 2                | 2            |                |

**GENERIC ELECTIVE COURSE I: BASIC ACCOUNTING**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D01 COM</b>    | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**COURSE OUTCOME**

After studying the course, students shall be able to;

CO 1: describe the basic accounting concepts

CO 2: record the business transactions in the proper books of accounts

CO 3: prepare financial statements of a sole trading concern

**Unit I**

**Introduction** :Basic Accounting concepts - Kinds of Accounts – Double Entry Book Keeping – Rules of Debit and Credit.

[6 Hours]

**Unit II**

**Recording of Transactions:** – Preparation of Journal and Ledger Accounts- Simple problems .

[8 Hours]

**Unit III**

**Subsidiary books** - cash book – types of cash book – problems(single column and two column only) -purchase book - sales book - sales return - purchase return books –Journal proper

[6 Hours]

**Unit IV**

**Trial balance** – Meaning and purpose-Preparation of trial balance

[6 Hours]

**Unit V**

**Financial Statements** –Trading and Profit & Loss Account – Balance sheet (of sole trading concern) – Simple Problems

[10 Hours]

**(Theory and problems may be in the ratio of 30% and 70% respectively)**

**Reference Books:**

1. Grewal, T.S: Double Entry Book Keeping
2. Jain and Narang: Advanced Accountancy
3. Shukla and Grewal: Advanced Accountancy
4. Gupta and Radhaswamy: Advanced Accountancy
5. Gupta R.L: Advanced Accountancy

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 4     |
| II    | 6     |
| III   | 8     |
| IV    | 4     |
| V     | 10    |
| Total | 32    |

## GENERIC ELECTIVE COURSE II: E-COMMERCE

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5D02 COM    | 2              | 2      | 2        |

### COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1: understand the concept of E commerce and its framework.

CO2: understand the concept of web commerce

CO 3: Acquire knowledge regarding cyber laws

#### **Unit I**

**Introduction** :Business operations – Basic features – Elements- limitations of traditional commerce – Ecommerce- origin- growth- basic technologies- features- components, advantages, limitations- types of E-commerce.

[6 Hours]

#### **Unit II**

**E-Commerce – operational framework & security** .Computer system- Hardware – Software- Networks- Types- Extranet- Internet- Basics- feature- internet-services- Email– Internet Addressing – URL- www- web browsers- types- internet protocol- HTML – HTTP- Internet vulnerable- Hacking, Data theft, vandalism, cyber frauds, cookies, spanner etc- protection measures- pass words- firewalls, encryption , website protection .

[10 Hours]

#### **Unit III**

**Web Commerce:** Electronic market place- features- advertising and online marketing, purchase online- Handling money on net – Electronic Payment Systems- types- credit cards- electronic Cheque- Electronic Data Interchange – meaning, components- business application.

[10 Hours]

#### **Unit IV**

**Cyber Laws:** Information Technology Act 2000 – scope- definitions – objectives, authentication of electronic records – powers of central Govt.- Certifying authority, duties of subscribers – digital signature, private key, public key- penalties and adjudication - CRAT- Offences.

[10 Hours]



**Reference:**

1. Information Technology : BS Jolly & K.S Jolly (SuchithaPrakashan)
2. A profile of information Technology-Computer Digest : HR Banerjee (Jaico)
3. Electronic Commerce :Efraim Turban, Jae Lee, David King& Michael Chung (Pearson Edn. Asia, Delhi)
- 4 Frontiers of electronic commerce : Ravi Kalkotta& Andrew BWhinston (Wesley, Delhi)
5. E-Commerce John Wiley & Sons, HearyEt e

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 6     |
| II    | 10    |
| III   | 8     |
| IV    | 8     |
| Total | 32    |

### GENERIC ELECTIVE COURSE III: PRINCIPLES OF MANAGEMENT

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5D03 COM    | 2              | 2      | 2        |

#### COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: understand the basic concept of management

CO2: describe the functions of management

#### **Unit 1.**

**Introduction to Management:** - Meaning and definition, scope, importance, Management and administration,

(4 Hrs),

#### **Unit 2-**

**Planning:** - Meaning, objectives, types of plans, steps in planning and limitations of planning.

(8 Hrs)

#### **Unit 3-**

**Organising:** - Concept, significance, types- formal and informal, line and staff and functional, centralisation, decentralisation,

(10 Hrs)

#### **Unit 4 –**

**Staffing:** - Importance, sources of recruitment and selection, training and development. (conceptual framework only)

(8 hrs)

#### **Unit 5 –**

**Directing and Controlling:** - Meaning and elements of direction -Controlling- Meaning – steps..

(6 Hrs)

#### **References;**

1. Koontz.O. Donnel, Principles of management, Tata Mc grawhill, publishing co, New Delhi.
2. L. M. Prasad, Principles of Management, Sultan Chand & sons, New Delhi.
3. R.C. Bhatia, Business organisation and management, Ane books, P. Ltd. New Delhi.
4. Tripathy Reddy, Principles of Management Tata Mc Graw Hill Publishers, New Delhi.

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 4     |
| II    | 8     |
| III   | 8     |
| IV    | 8     |
| V     | 4     |
| Total | 32    |

## GENERIC ELECTIVE COURSE IV: INSURANCE AND RISK MANAGEMENT

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5D04 COM    | 2              | 2      | 2        |

### COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: explain the concept of insurance, its regulations and types

CO 2: understand the concept insurance risk and its management

#### **Unit I:**

**Introduction-** Meaning, definition, nature and functions of insurance-Principles of insurance- insurance documents.

(6 hours)

#### **Unit II:**

**Insurance sector reforms in India-** IRDA- Role and functions- TAC- Insurance Ombudsman.

(10 hours)

#### **Unit III:**

**Types of insurance-** Meaning and features of life – Marine, Health, Fire and other diversified insurance products-Micro insurance- Rural insurance.

(8 hours)

#### **Unit IV:**

**Insurance risk-**meaning and types-sources of risk- Risk Management : meaning and definition-personal and corporate risk management-stages in risk management process (A brief study).

(12 hours)

#### **Reference:**

1. Principles of Risk management &Insurance : George E Rejda
2. Risk Management &Insurance : Scott Harrington
3. Risk Management &Insurance : C. Arthur Williams
4. Insurance Industry : ICFAI Publication.

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 6     |
| II    | 6     |
| III   | 10    |
| IV    | 10    |
| Total | 32    |

## GENERIC ELECTIVE COURSE V: FINANCIAL SERVICES

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5D05 COM    | 2                 | 2      | 2           |

### COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1: Explain financial system and its constituents

CO 2: identify the different financial services provided by financial institutions

CO 3: develop a basic understanding of stock broking

#### **Unit I**

**Financial system**-Meaning-Nature and Role- Indian Financial System-Financial Intermediaries: Banking Institutions.-Non- Banking Institutions: Mutual Funds-Insurance companies -Housing finance Companies-Financial markets-Capital Markets & Money Markets -Financial Instruments: short-medium, long term

[15 Hours]

#### **Unit II**

**Financial Services**- meaning-importance- components-Depository Services- Custodial services-Credit Rating-Credit rating agencies- procedure-methodology-symbols and grades. Factoring- Forfeiting - merchant Banking-Leasing-Hire purchase-Guaranteeing-Portfolio management-Under writing-Venture capital. (Basic Concepts only)

[16 hours]

#### **Unit III**

**Stock broking**- Stock brokers-Sub brokers-Foreign brokers- Stock market trading-Derivative trading

[5 hours]

#### **Reference:**

1. Indian Financial System Bharati V .Pathak
2. Merchant Banking and Financial services Dr .S.Gurusamy
3. Indian Financial system Dr .S. Gurusamy
4. Indian Financial system P.N.|VarshneyD.K.Mittal
5. Financial Services D.JosephAnbarasa ,V.K.Boominathan  
P.Manoharan&G.Gnanaraj
6. Financial Services : M.Y Khan.

**Marks including choice:**

| Unit  | Marks |
|-------|-------|
| I     | 14    |
| II    | 12    |
| III   | 6     |
| Total | 32    |

**PART E**

**PATTERN OF QUESTION PAPERS**

**FOR CORE COURSES, GENERAL AWARENESS COURSES AND  
COMPLEMENTARY ELECTIVE COURSES (NOT HAVING PRACTICAL)**

----- SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (*MONTH, YEAR*)  
(*COURSE CODE*). (*COURSE TYPE*). (*COURSE TITLE*)

Time: 3 Hrs

Max. Mark: 40

**PART- A**

**Answer any SIX questions from the following. Each question carries 1 marks**

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

(6 X 1 = 6 marks)

**PART – B**

**Answer any SIX questions from the following. Each question 3 marks**

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

(6 X 3 = 18 marks)

**PART - C**

**Answer any TWO questions from the following. Each question carries 8 marks**

- 17.
- 18.
- 19.

(2 X 8= 16 marks)



**FOR CORE COURSES, GENERAL AWARENESS COURSES AND  
COMPLEMENTARY ELECTIVE COURSES (HAVING PRACTICAL)**

----- **SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (MONTH, YEAR)**  
**(COURSE CODE). (COURSE TYPE). (COURSE TITLE)**

Time: 2 Hrs

Max. Mark: 20

**PART- A**

**Answer any THREE questions from the following. Each question carries 1 marks**

- 1.
- 2.
- 3.
- 4.

(3 X 1 = 3 marks)

**PART – B**

**Answer any THREE questions from the following. Each question 3 marks**

- 5.
- 6.
- 7.
- 8.

(3 X 3 = 9 marks)

**PART - C**

**Answer any ONE question from the following. The question carries 8 marks**

- 9.
- 10.

(1 X 8 = 8 marks)

**FOR GENERIC ELECTIVE COURSE**

----- SEMESTER ----- DEGREE (CBCSS) EXAMINATION (*MONTH, YEAR*)  
(*COURSE CODE*). (*COURSE TYPE*). (*COURSE TITLE*)

Time: 2 Hrs

Max. Mark: 20

**PART- A**

**Answer any THREE questions from the following. Each question carries 1 marks**

- 1.
- 2.
- 3.
- 4.

(3 X 1 = 3 marks)

**PART – B**

**Answer any THREE questions from the following. Each question 3 marks**

- 5.
- 6.
- 7.
- 8.

(3 X 3 = 9 marks)

**PART - C**

**Answer any ONE question from the following. The question carries 8 marks**

- 9.
- 10.

(1 X 8 = 8 marks)

**PART F**  
**MODEL QUESTION PAPERS**

**I SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (MONTH, YEAR)**

**1B01COM (CORE I) : MANAGEMENT CONCEPTS AND PRINCIPLES**

**Time: 3 hours**

**Mark: 40**

**Section A**

**Answer any six questions in one or two sentences. Each question carries 1 mark**

1. Define the term management.
2. What do you mean by systems approach to management?
3. What is functional organization?
4. Explain the term 'motivation'.
5. Who is an autocratic leader?
6. What do you mean by corporate social responsibility?
7. What is TQM?
8. What is meant by controlling in management?

(6 x 1 =6)

**Section B**

**Answer any six questions in not exceeding one page. Each question carries 3 marks**

9. Examine the nature and purpose of organization.
10. What are the principles and techniques of directing?
11. Enumerate the importance of motivation in an organization.
12. Explain the applicability of theory X and Y in motivating employees in an organization.
13. Briefly describe the environmental issues in a business organization.
14. What do you mean by stress management? What are its importance?
15. Explain the fish bone diagram
16. Discuss the ways in which planning and controlling are related

( 6 x 3 = 18)

**Section B**

**Answer any two questions in not exceeding three pages. Each question carries 8 marks**

17. What is scientific management and explain the principles of scientific management.
18. Define planning and explain the steps involved in the planning process.
19. What do you mean by business ethics? Explain the characteristics and factors influencing business ethics.

( 2 x 8 = 16)

**I SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (MONTH, YEAR)**

**1A11COM (GENERAL AWARENESS COURSE. I): BUSINESS STATISTICS  
AND BASIC NUMERICAL SKILLS**

**Time: 3 hours**

**Mark: 40**

**Section A**

**Answer any six questions. Each question carries 1 mark**

1. Define standard deviation.
2. What is statistical units?
3. Write the formulae of Standard deviation of the combined series.
4. solve using crammer's rule:  
$$2x-3y = 3$$
$$4x-y = 1$$
5. If  $A = \{1,4,7,10\}$ ,  $B = \{2,4,5,8\}$ ,  $U = \{1,2,3,4,5,6,7,8,9,10\}$   
Find  $A \cap B$
6. Construct a truth table for  
 $(P \wedge q) \wedge \sim P$
7. Represent  $A \cap B$  by using venn diagram, provided A and B have common element?
8. What is trace of a matrix. Give an example (6 x 1 =6)

**Section B**

**Answer any six questions. Each question carries 3 marks**

9. Find out Quartile Deviation from the following  
X: 10 20 40 80 50 42 45  
F: 7 5 8 9 20 8 3
10. From the following calculate the mEan deviation about median  
Class: 10-20 20-30 30-40 40-50 50-60 60-70  
F : 8 12 28 18 7 4
11. The mean and Standard Deviation of 200 items were found to be 60 and 20 respectively. At the time of calculation, two items were wrongly taken as 3 and 67 instead of 13 and 17. Find correct mean and standard deviation.
12. A town has total population of 50000 out of it 28 000 read ' patriot' and 23000 read ' Times of India' while 4000 read both the news papers. Indicate how many read neither patriot, nor time of India?
13. Prove that  $A \cup (B \cap C) = (A \cap B) \cup (A \cap C)$  with the help of venn diagram
14. Solve the system of equation by using matrixes  
$$5x-6y+4z = 15$$
$$7x+4y-3z = 19$$
$$2x+y+6z = 46$$

15. By Means of truth table show that:

$$\sim (P \Rightarrow q) = P \wedge \sim q$$

16. find the determinant of

$$\begin{vmatrix} 1 & 2 & 1 \\ & 2 & 3 & 1 \\ & 1 & 3 & 1 \end{vmatrix}$$

( 6 x 3 = 18)

### Section C

**Answer any two questions. Each question carries 8 marks**

17. From the prices of Shares of A company and B company given below, state which is more stable in value.

A: 55 54 52 53 56 58 52 50 51 49

B: 108 107 105 105 106 107 104 103 104 101

18. From the following find out Fishers Price Index and also prove Time Reversal and Factor reversal test are satisfied by it.

| Commodity | Year 2005 |          | Year 2007 |       |
|-----------|-----------|----------|-----------|-------|
|           | Price     | Quantity | Quantity  | Price |
| A         | 10        | 8        | 10        | 12    |
| B         | 15        | 12       | 15        | 20    |
| C         | 9         | 7        | 10        | 10    |
| D         | 12        | 6        | 9         | 15    |

19 solve the following system of equations

$$7x - 4y - 20z = 0$$

$$10x - 13y - 14z = 0$$

$$3x + 4y - 9z = 11$$

( 2 x 8 = 16)

**II SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (MONTH, YEAR)**

**2C01 COM (COMPL- I) QUANTITATIVE TECHNIQUE FOR BUSINESS DECISIONS**

**Time: 3 hours**

**Max. Mark: 40**

**Section A**

**Answer any six questions. Each question carries 1 mark**

1. Write regression equation X on Y.
2. Define conditional probability.
3. Mention the components of time series.
4. What is the relationship between correlation coefficient and regression coefficient?
5. What do you understand by binomial distribution?
6. What is the probability of getting 3 white balls in a draw of 3 balls from a box containing 5 white and 4 black balls?
7. In the study of regression equations, following values were obtained. Regression coefficient of Y on X = .25,  $r = .42$  and SD of Y = 4. Find SD of X?
8. What is positive and negative correlation?

(6 x 1 =6)

**Section B**

**Answer any six questions. Each question carries 3 marks**

9. Explain the usefulness of the study of regression.
10. Coefficient of correlation between two variable X and Y is 0.48. Their co variation is 36. The variance of X = 16. Find the SD of Y series?
11. Two judges in a dance completion rank 12 entries as follows.

|   |    |   |   |    |   |   |   |   |   |    |    |    |
|---|----|---|---|----|---|---|---|---|---|----|----|----|
| X | 1  | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Y | 12 | 9 | 6 | 10 | 3 | 5 | 4 | 7 | 8 | 2  | 11 | 1  |
12. A bag contains 6 white, 4 red and 10 black balls. Two balls are drawn at random. Find the probability that they will be both black?
13. Distinguish between cyclic and seasonal variations?
14. Briefly explain Type I and Type II errors.
15. Explain;
  - a) Mutually exclusive events
  - b) Random experiments
  - c) Independent events

16. Calculate the coefficient of correlation for the following data;

|   |    |    |    |    |    |    |
|---|----|----|----|----|----|----|
| X | 9  | 18 | 18 | 20 | 20 | 23 |
| Y | 23 | 33 | 23 | 42 | 29 | 32 |

( 6 x 3 = 18)

### Section B

**Answer any two questions. Each question carries 8 marks**

17. Calculate trend values by taking 3 yearly period of moving average from the following data.

|       |      |      |      |      |      |      |      |      |      |
|-------|------|------|------|------|------|------|------|------|------|
| Year  | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
| Sales | 5    | 7    | 9    | 12   | 11   | 10   | 8    | 12   | 13   |
| Year  | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |      |      |      |
| Sales | 17   | 19   | 14   | 13   | 12   | 15   |      |      |      |

18. a) A coin is tossed 6 times. What is the probability of obtaining four or more heads?

b) A life insurance salesman sells on an average 3 life insurance policies per week.

Use poisson's law to calculate the probability that in a given week he will sell 2 or more policies but less than 6 policies.

19. What is "Hypothesis"? Explain its characteristics. Also explain Chi square test and Z test.

( 2 x 8 = 16)

**II SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (MONTH, YEAR)**

**2 B02COM(CORE II) : FUNCTIONAL APPLICATIONS OF MANAGEMENT**

**Time: 3 hours**

**Max. Marks: 40**

**SECTION A**

**Answer any six questions in one or two sentences. Each question carries 1 mark**

1. Explain the term Over capitalization.
2. Define financial planning.
3. What is social marketing?
4. What is market segmentation?
5. What is brand equity?
6. What is job analysis?
7. What is induction?
8. What is kaizen?

(6 x 1 = 6)

**SECTION B**

**Answer any six questions in not exceeding one page. Each question carries 3 marks**

9. Explain the Qualities of a sound financial PLAN.
10. What is working capital? Explain the factors influencing the working capital decision of a firm.
11. Explain product positioning.
12. What is marketing mix? Explain its elements.
13. Explain the concept of Product life cycle.
14. Briefly explain the steps in selection process.
15. What are the qualities required for an efficient HR manager?
16. Explain the scope of HRM in the modern business environment.

(6 x 3 = 18)

**SECTION C**

**Answer any two questions in not exceeding three pages. Each question carries 8 marks**

17. What is capital structure? Explain the Factors governing capital structure.
18. What is performance appraisal? Explain the methods of performance appraisal.
19. Explain the bases and pattern of Market segmentation

(2 x 8 = 16)





## KANNUR UNIVERSITY

(Abstract)

B Sc Chemistry/ B.Sc.Biochemistry/B.Sc.Polymer Chemistry Programmes -Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

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Academic Branch

No.Acad/C2/12380/2019

Civil Station P.O Dated 20/06/2019

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- Read:-
1. U.O.No.Acad.C2/429/2017 dt.10-10-2017
  2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
  3. U.O No.Acad.C2/429/2017 Vol.II dt.03-06-2019
  4. The Minutes of the meeting of the Board of Studies in ChemistryUG held on 07-06-2019
  5. The Syllabus submitted by the Chairperson, Board of Studies in Chemistry (UG)dated 13/06/2019

### ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.
2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies, Workshops and discussions.
3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.
4. Subsequently, as per paper read (4) above, the Board of Studies in Chemistry (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc.Chemistry/B.Sc. Biochemistry/ B.Sc.Polymer Chemistry Programmes to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Chemistry (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc. Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry programmes.
6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) of B.Sc Chemistry, B.Sc Biochemistry and B.Sc Polymer Chemistry programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in Affiliated colleges with effect from 2019 Admission, subject to reporting to the Academic Council.
7. The Scheme, Syllabus & Pattern of Question Papers of B.Sc Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry Programmes are uploaded in the University website ([www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in))

Orders are issued accordingly.

Sd/-  
DEPUTY REGISTRAR(ACADEMIC)  
for REGISTRAR

To

The Principals of Colleges offering B.Sc Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry programme

- Copy to:-
1. The Examination Branch (through PA to CE)
  2. The Chairperson, Board of Studies in Chemistry (UG)
  3. PS to VC/PA to PVC/PA to Registrar
  4. DR/AR-I, Academic
  5. The Computer Programmer(for uploading in the website)
  6. SF/DF/FC



Forwarded/By Order

A handwritten signature in black ink, appearing to be 'A. G.', written over a horizontal line.

SECTION OFFICER



**KANNUR UNIVERSITY**

**BOARD OF STUDIES, CHEMISTRY (UG)**

**SYLLABUS FOR CHEMISTRY CORE COURSE**

**COMPLEMENTARY ELECTIVE COURSE AND GENERIC ELECTIVE COURSES**

**FOR BSc CHEMISTRY PROGRAMME**

**CHOICE BASED CREDIT AND SEMESTER SYSTEM**

**(2019 ADMISSION ONWARDS)**

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**ANNEXURE (i)**  
**KANNUR UNIVERSITY**  
**VISION AND MISSION STATEMENTS**

**Vision:** To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

**Mission:**

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

**ANNEXURE (ii)****KANNUR UNIVERSITY****PROGRAMME OUTCOMES (PO)****PO 1.Critical Thinking:**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

**PO 2.Effective Citizenship:**

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

**PO 3.Effective Communication:**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

**PO 4.Interdisciplinarity:**

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

## PREFACE

The syllabus is prepared based on an interdisciplinary approach and aim to provide the students a deep understanding of the basic concepts of chemical sciences by acquiring the knowledge of terms, facts, concepts, processes, techniques and principles of the subject. It attempts to equip the students to cater to the industrial needs and to utilise them in the utmost practical manner.

The updated syllabus is prepared based on Kannur University Regulations for Choice Based Credit and Semester System for Under-Graduate Programme 2019” (in OBE – Outcome Based Education – system) (KUCBCSSUG 2019) with a view to implement outcome based education (OBE) and curriculum from the academic year 2019 -20 onwards as proposed by higher education agencies .

An OBE curriculum means, starting with a clear picture of what is important for students to be able to do, then organizing the curriculum, instruction and assessment to make sure this learning ultimately happens. Intended learning outcomes (POs, PSOs and COs) which specify what graduates completing BSc Chemistry programme are expected to know, understand and be able to do at the end of their programme of study were discussed at various stages in three day OBE workshop conducted by KSHEC Trivandrum associated with Kannur University. These learning outcomes (POs, PSOs and COs) were further discussed along with content of the syllabus and assessment methods at the workshops conducted for faculty members and other stakeholders for restructuring curriculum by Kannur University and finalised after consulting with intellectuals, academicians, faculty members, researchers and students

The B Sc degree programme in Chemistry designed for students to attain the intended learning outcomes which specified as PSOs (Programme Specific Outcome) and COs (Course Outcome) are clearly stated in the syllabus.

The mission and vision statements and PO statements of the University were given at the beginning of the syllabus and PSO statements before the scheme of the syllabus. The CO statements are given in the beginning of each of the courses. Teachers need to aware these statements as these describe the desired educational accomplishments of the degree programs. The reference materials have been recommended after a thorough study. The revised course pattern, distribution of credits, scheme of evaluation and syllabus approved by the board are given.

There are many personalities whose support and guidance made this restructured syllabus a reality. I express my profound gratitude to the members of the Board of Studies (UG) in Chemistry who provided me extensive personal and professional support during the work of restructuring this syllabus. With immense pleasure and gratitude I remember the untiring support rendered by the faculty members of Chemistry from various Colleges of Kannur University, academic community and all other stake holders who worked for preparing this restructured syllabus and curriculum.

Saheed VK

Chairperson

Board of Studies, Chemistry(UG) ,Kannur University.

**Kannur University****BSc Chemistry Programme****Programme Specific Outcomes (PSOs)**

**After successful completion of three year degree program in Chemistry a student should be able to;**

**PSO 1** Understand the fundamental concepts, principles and processes underlying the academic field of chemistry, its different subfields (analytical, inorganic, organic and physical), and its linkages with related disciplinary areas/subjects;

**PSO 2** Demonstrate procedural knowledge that creates different types of professionals in the field of chemistry and related fields such as pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.;

**PSO 3**Employ critical thinking and the scientific method to design, carry out, record and analyze the results of chemical experiments and get an awareness of the impact of chemistry on the environment and the society.

**PSO 4** Use chemical techniques relevant to academia and industry, generic skills and global competencies, including knowledge and skills that enable students to undertake further studies in the field of chemistry or a related field, and work in the chemical and non-chemical industry sectors.

**PSO5** Undertake hands on lab work and practical activities which develop problem solving abilities required for successful career in pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.

**PSO 6**Understand safety of chemicals, transfer and measurement of chemical, preparation of solutions, and find out the green route for chemical reaction for sustainable development.

**PSO 7** Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

COURSE STRUCTURE FOR CHEMISTRY (UG) PROGRAMME  
2019 ADMISSION

SEMESTER I

| No. | Title of the Course                               | Hours /week | Credit | MARKS |     |       |
|-----|---------------------------------------------------|-------------|--------|-------|-----|-------|
|     |                                                   |             |        | CE    | ESE | TOTAL |
| 1   | English Common Course I                           | 5           | 4      | 10    | 40  | 50    |
| 2   | English Common Course II                          | 4           | 3      | 10    | 40  | 50    |
| 3   | Additional Common Course I                        | 4           | 4      | 10    | 40  | 50    |
| 4   | Core Course 1 (Theoretical & Inorganic Chemistry) | 2           | 2      | 10    | 40  | 50    |
| 5   | Core Course 2 Practical I Part 1                  | 2           | -      | -     | -   | -     |
| 6   | Complementary Elective -I (Course I)              | 2           | 2      | 8     | 32  | 40    |
| 7   | Complementary Elective Practical                  | 2           | -      | -     | -   | -     |
| 8   | Complementary Elective -II (Course I)             | 4           | 3      | 10    | 40  | 50    |
|     | Total                                             | 25          | 18     | 58    | 232 | 290   |

SEMESTER-II

| No | Title of the Course                                   | Hours /week | Credit | MARKS |     |       |
|----|-------------------------------------------------------|-------------|--------|-------|-----|-------|
|    |                                                       |             |        | CE    | ESE | TOTAL |
| 1  | English Common Course III                             | 5           | 4      | 10    | 40  | 50    |
| 2  | English Common Course IV                              | 4           | 3      | 10    | 40  | 50    |
| 3  | Additional Common Course- II                          | 4           | 4      | 10    | 40  | 50    |
| 4  | Core Course 3 (Analytical and Inorganic chemistry- I) | 2           | 2      | 10    | 40  | 50    |
| 5  | Core Course 2, Practical I - Part 2                   | 2           | 3      | 10    | 40  | 50    |
| 6  | Complementary Elective – I (Course II)                | 2           | 2      | 8     | 32  | 40    |
| 7  | Complementary Elective Practical                      | 2           | -      | -     | -   | -     |
| 8  | Complementary Elective -II (CourseII)                 | 4           | 3      | 10    | 40  | 50    |
|    | Total                                                 | 25          | 21     | 68    | 272 | 340   |



## SEMESTER-III

| No | Title of the Course                    | Hours /week | Credit | MARKS |     |       |
|----|----------------------------------------|-------------|--------|-------|-----|-------|
|    |                                        |             |        | CE    | ESE | TOTAL |
| 1  | English Common Course V                | 5           | 4      | 10    | 40  | 50    |
| 2  | Additional Common Course- III          | 5           | 4      | 10    | 40  | 50    |
| 3  | Core Course4 (Organic Chemistry I)     | 3           | 3      | 10    | 40  | 50    |
| 4  | Core Course 5 Practical 2,Part I       | 2           | -      | -     | -   | -     |
| 5  | Complementary Elective -1(CourseIII)   | 3           | 2      | 8     | 32  | 40    |
| 6  | Complementary Elective Practical       | 2           | -      | -     | -   | -     |
| 7  | Complementary Elective -II (CourseIII) | 5           | 3      | 10    | 40  | 50    |
|    | TOTAL                                  | 25          | 16     | 48    | 192 | 240   |

## SEMESTER-IV

| No | Title of the Course                   | Hours /week | Credit | MARKS |     |       |
|----|---------------------------------------|-------------|--------|-------|-----|-------|
|    |                                       |             |        | CE    | ESE | TOTAL |
| 1  | English Common Course VI              | 5           | 4      | 10    | 40  | 50    |
| 2  | Additional Common Course- IV          | 5           | 4      | 10    | 40  | 50    |
| 3  | Core Course 6(Organic Chemistry II)   | 3           | 3      | 10    | 40  | 50    |
| 4  | Core Course 5 Practical 2,Part II     | 2           | 3      | 10    | 40  | 50    |
| 5  | Complementary Elective -1(CourseIV)   | 3           | 2      | 8     | 32  | 40    |
| 6  | Complementary Elective Practical      | 2           | 4      | 8     | 32  | 40    |
| 7  | Complementary Elective -II (CourseIV) | 5           | 3      | 10    | 40  | 50    |
|    | TOTAL                                 | 25          | 23     | 66    | 264 | 330   |

## SEMESTER-V

| No | Title of the Course                                 | Hours /week | Credit | MARKS |     |       |
|----|-----------------------------------------------------|-------------|--------|-------|-----|-------|
|    |                                                     |             |        | CE    | ESE | TOTAL |
| 1  | Generic Elective Course                             | 2           | 2      | 5     | 20  | 25    |
| 2  | Core Course 7 Analytical and Inorganic Chemistry-II | 3           | 4      | 10    | 40  | 50    |
| 3  | Core Course 8 (Inorganic Chemistry)                 | 3           | 4      | 10    | 40  | 50    |
| 4  | Core Course 9 (Physical Chemistry-I)                | 3           | 4      | 10    | 40  | 50    |
| 5  | Core Course 10 (Physical Chemistry-II)              | 3           | 4      | 10    | 40  | 50    |
| 6  | Core Course 11, Practical 3                         | 5           | -      | -     | -   | -     |
| 7  | Core Course 12, Practical 4                         | 5           | -      | -     | -   | -     |
| 8  | Core Course 13 Project/Industrial Visit             | 1           | -      | -     | -   | -     |
|    | <b>TOTAL</b>                                        | 25          | 18     | 45    | 180 | 225   |

## SEMESTER-VI

| No | Title of the Course                                | Hours /week | Credit | MARKS     |           |           |
|----|----------------------------------------------------|-------------|--------|-----------|-----------|-----------|
|    |                                                    |             |        | CE        | ESE       | TOTAL     |
| 1  | Core Course 14 (Organic Chemistry-III)             | 4           | 4      | 10        | 40        | 50        |
| 2  | Core Course 15 (Physical Chemistry-III)            | 4           | 3      | 10        | 40        | 50        |
| 3  | Core Course 16 (Physical methods In Chemistry)     | 3           | 3      | 10        | 40        | 50        |
| 4  | Core Course 17 Discipline Specific Elective Course | 3           | 3      | 10        | 40        | 50        |
| 5  | Core Course 18, Practical 5                        | 3           | 3      | 10        | 40        | 50        |
| 6  | Core Course 11& 12 Practical 3& 4                  | 7           | 6      | 10+<br>10 | 40+<br>40 | 50+<br>50 |
| 7  | Core Course 13 Project Industrial Visit            | 1           | 2      | 4         | 16+<br>5  | 25        |
|    | <b>TOTAL</b>                                       | 25          | 24     | 74        | 301       | 375       |

First Complementary Elective –Physics, Second Complementary Elective-Mathematics

Total Credit 120

Total Marks 1800

[Type text]

## Scheme of Mark distribution - B Sc Chemistry Programme

| Course                                     | No.of Papers              | Marks per paper | Total Marks |
|--------------------------------------------|---------------------------|-----------------|-------------|
| English Common Course                      | 6                         | 50              | 300         |
| Additional Common Course                   | 4                         | 50              | 200         |
| Complementary Elective Course -Physics     | 5(4 Theory +1Practical)   | 40              | 200         |
| Complementary Elective Course -Mathematics | 4                         | 50              | 200         |
| Core Course-Chemistry                      | 17(12Theory +5Practicals) | 50              | 850         |
| Project                                    | 1                         | 25              | 25          |
| Generic Elective Course                    | 1                         | 25              | 25          |

## Credit distribution - B Sc Chemistry Programme (Semester I to VI)

| Programme       | Sem.  | Common* |      | Core Chemistry  | Complementary Elective Course |         | Generic Elective Course | Total |
|-----------------|-------|---------|------|-----------------|-------------------------------|---------|-------------------------|-------|
|                 |       | Eng     | Addl |                 | Mathematics                   | Physics |                         |       |
| BSc (Chemistry) | I     | 4+3     | 4    | 2               | 3                             | 2       |                         | 18    |
|                 | II    | 4+3     | 4    | 2+3             | 3                             | 2       |                         | 21    |
|                 | III   | 4       | 4    | 3               | 3                             | 2       |                         | 16    |
|                 | IV    | 4       | 4    | 3+3             | 3                             | 2+4     |                         | 23    |
|                 | V     |         |      | 4+4+4+4         |                               |         | 2                       | 18    |
|                 | VI    |         |      | 4+3+3+3+3+3+3+2 |                               |         |                         | 24    |
|                 | Total |         | 22   | 16              | 56                            | 12      | 12                      | 2     |

## Components of Core (Chemistry)

The core courses of BSc Chemistry Programme will consists of the following components.

- Theory
- Practical
- Project (Investigatory)
- Study tour (Visiting Factory/ science institute/laboratory).

**Scheme of Core course (Chemistry)**

| No. | Semester | Course code               | Title of the Course                                      | Credits | Contact hr/week         |
|-----|----------|---------------------------|----------------------------------------------------------|---------|-------------------------|
| 1   | I        | 1B01CHE                   | Theoretical and Inorganic Chemistry                      | 2       | 2                       |
| 2   | II       | 2B03CHE                   | Analytical and Inorganic chemistry-I                     | 2       | 2                       |
| 3   | II       | 1B02CHE/PCH & 2B02CHE/PCH | *Core Course Practical I Volumetric Analysis             | 3       | 2—I Sem<br>2—II Sem     |
| 4   | III      | 3B04CHE/PCH               | Organic Chemistry-I                                      | 3       | 3                       |
| 5   | IV       | 4B06CHE/PCH               | Organic Chemistry-II                                     | 3       | 3                       |
| 6   | IV       | 3B05CHE/PCH & 4B05CHE/PCH | *Core Course Practicals 2 Inorganic Qualitative Analysis | 3       | 2—III Sem<br>2—IV Sem   |
| 7   | V        | 5B07CHE/PCH               | Analytical and Inorganic chemistry-II                    | 4       | 3                       |
| 8   | V        | 5B08CHE/PCH               | Inorganic Chemistry                                      | 4       | 3                       |
| 9   | V        | 5B09CHE/PCH               | Physical Chemistry- I                                    | 4       | 3                       |
| 10  | V        | 5B10CHE/PCH               | Physical Chemistry- II                                   | 4       | 3                       |
| 11  | VI       | 6B14CHE/PCH               | Organic Chemistry III                                    | 4       | 4                       |
| 12  | VI       | 6B15CHE/PCH               | Physical Chemistry III                                   | 3       | 4                       |
| 13  | VI       | 6B16CHE/PCH               | Physical Methods in Chemistry                            | 3       | 3                       |
| 14  | VI       | 6B17CHE/PCH               | Discipline Specific Elective Course                      | 3       | 3                       |
| 15  | VI       | 5B11CHE/PCH & 6B11CHE/PCH | *Core Course Practicals 3 Gravimetric Analysis           | 3       | 5—V Sem<br>4—VI Sem     |
| 16  | VI       | 5B12CHE/PCH & 6B12CHE/PCH | *Core Course Practicals 4 Organic Chemistry              | 3       | 5---V Sem<br>3---VI Sem |
| 17  | VI       | 6B18CHE/PCH               | *Core Course Practicals5 Physical Chemistry              | 3       | 3                       |
| 18  | VI       | 5B13CHE/PCH & 6B13CHE/PCH | Project & Industrial Visit                               | 2       | 1—SemV<br>1---Sem VI    |

\* External examination will be held at the end of II/ IV/VI semester

## Scheme for Discipline Specific Elective Course

| No | Semester | Course code   | Title of the course     | Contact hour/Week | Credit |
|----|----------|---------------|-------------------------|-------------------|--------|
| 1  | VI       | 6B17CHE/PCH-A | Environmental Chemistry | 3                 | 3      |
| 2  | VI       | 6B17CHE/PCH-B | Applied Chemistry       | 3                 | 3      |
| 3  | VI       | 6B17CHE/PCH-C | Polymer Chemistry       | 3                 | 3      |
| 4  | VI       | 6B17CHE/PCH-D | NanoChemistry           | 3                 | 3      |

## Scheme for Complementary Elective Course (Chemistry)

| No | Semester     | Course code      | Title of the course                               | Contact hour/week | Credit |
|----|--------------|------------------|---------------------------------------------------|-------------------|--------|
| 1  | I            | 1C01CHE/PCH      | Chemistry<br>(For Physical & Biological Sciences) | 2                 | 2      |
| 2  | II           | 2C02CHE/PCH      | Chemistry<br>(For Physical & Biological Sciences) | 2                 | 2      |
| 3  | III          | 3C03CHE/PCH( BS) | Chemistry (For Biological Science)                | 3                 | 2      |
| 4  | III          | 3C03CHE/PCH( PS) | Chemistry (For Physical Science)                  | 3                 | 2      |
| 5  | IV           | 4C04CHE/PCH( BS) | Chemistry (For Biological Science)                | 3                 | 2      |
| 6  | IV           | 4C04CHE/PCH( PS) | Chemistry (For Physical Science)                  | 3                 | 2      |
| 5  | I,II, III&IV | 4C05CHE*/PCH     | Complementary Elective Course practical           | 2                 | 4      |

\* External examination will be conducted at the end of IV semester.

**Scheme of Generic Elective Course**

The Generic Elective course is meant for all the students in the institution except the students of BSc Chemistry Programme. External examination will be conducted at the end of V<sup>th</sup> semester.

## Options available for Generic Elective course (Chemistry)

| No | Semester | Course code | Title of the course         | Contact hour/ week | Credit |
|----|----------|-------------|-----------------------------|--------------------|--------|
| 1  | V        | 5D01CHE/PCH | Chemistry in Service to man | 2                  | 2      |
| 2  | V        | 5D02CHE/PCH | Drugs-Use & Abuse           | 2                  | 2      |
| 3  | V        | 5D03CHE/PCH | Environmental Studies       | 2                  | 2      |
| 4  | V        | 5D04CHE/PCH | Nanomaterials               | 2                  | 2      |
| 5  | V        | 5D05CHE/PCH | Chemistry in Every day life | 2                  | 2      |

**Evaluation pattern**

Mark system will be followed instead of direct grading for each question. For each course in the semester letter grade, grade point and % of marks are introduced in 7-point indirect grading system as per KUCBCSSUG 2019. Accordingly 20% of the total marks in each course are for internal evaluation and the remaining 80% for external evaluation.

Internal Evaluation (Core , Complementary Elective & Generic Elective)  
Components with percentage of marks of Internal Evaluation of theory

Test papers-60%

Seminar/Viva-40%

Internal evaluation is conducted by the concerned Department in mark system. Marks secured for internal evaluation need be send to University.

External Evaluation (Core , Complementary Elective & Generic Elective )

External assessment will include Theory, Practical and Project evaluation conducted by University after the completion of a semester. Duration of theory examination for Core & Complementary courses will be 3 hours, whereas for Generic Elective course is 2 hours. The practical examination for Core Course Practical I- Volumetric Analysis will be 3 hours and other Core & Complementary Elective practical exam will be of 4 hour duration.

Project work:

Project works will be carried out in fifth and sixth semesters. Not more than five students can form a group and undertake a project. Each individual student should submit a copy of the project report duly attested by the supervising teacher and Head of the department. The report has to be presented at the time of practical examination conducted at the end of VI semester for evaluation.

Study tour:

Students are required to visit a factory/Laboratory/Research Institute of repute during the course and have to submit the report of the study tour at the end of the sixth semester

[Type text]

during the time of practical examination. No credit will be separately given for study tour report.

Practical record, Project report & Study tour report must be certified by the teacher in charge and countersigned by the Head of the Department. Students should submit certified record of respective practical work at the time of University practical examination.

#### Mark distributions

Table 1: Internal and External marks for Core (Chemistry) courses:

| Item             | Marks    |          | Total |
|------------------|----------|----------|-------|
|                  | Internal | External |       |
| Theory           | 10       | 40       | 50    |
| Practical        | 10       | 40       | 50    |
| Industrial visit | --       | 5        | 5     |
| Project          | 4        | 16       | 20    |

Table 2: Internal and External marks for Complementary Elective Course (Chemistry)

| Item      | Marks    |          | Total |
|-----------|----------|----------|-------|
|           | Internal | External |       |
| Theory    | 8        | 32       | 40    |
| Practical | 8        | 32       | 40    |

Table 3: Internal and External marks for Generic Elective Course (Chemistry)

| Item   | Marks    |          | Total |
|--------|----------|----------|-------|
|        | Internal | External |       |
| Theory | 5        | 20       | 25    |

Table 4: Distribution of Internal marks for Theory courses (Core, Complementary Elective & Generic Elective)

|              |      |
|--------------|------|
| Seminar/Viva | 40%  |
| *Test paper  | 60 % |

\* At least two test papers are to be conducted and average of these two is to be taken for awarding mark.

Table 5: Distribution of Internal marks for Practical courses

|                           |     |
|---------------------------|-----|
| Record + Lab involvement* | 50% |
| Test papers/ Viva         | 50% |

\*On completion of each experiment, a report should be presented to the course teacher. It should be recorded in a bound note-book. The experimental description should include aim, principle, materials/apparatus required/used, method/procedures, and tables of data collected, equations, calculations, graphs, and other diagrams etc. as necessary and final results.

Table 6: Distribution of internal and external marks for Project

| Internal (20% of Total)           | %    | External (80 % of total)                                   | %    |
|-----------------------------------|------|------------------------------------------------------------|------|
| Punctuality                       | 20 % | Relevance of Topic/Statement of Objectives and Methodology | 20%  |
| Use of data                       | 20%  | Presentation/Quality of analysis and findings              | 30 % |
| Scheme and Organization of report | 30%  | Viva Voce                                                  | 50%  |
| Viva Voce                         | 30 % |                                                            |      |

### Distribution of Marks & type of questions for Core Course

#### Marks including choice:

| Unit | Marks |
|------|-------|
|      |       |
|      |       |
|      |       |
|      |       |

Table 7. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.



**Distribution of Marks & type of questions for Complementary Elective Course**  
**Marks including choice:**

| Unit | Marks |
|------|-------|
|      |       |
|      |       |
|      |       |
|      |       |

Table 8. Type of Questions & Marks for External Examination- Complementary Elective Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                      | 5           |
| Short answer         | 6               | 4                               | 2                      | 8           |
| Short essay/Problems | 5               | 3                               | 3                      | 9           |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 20              | 14                              |                        | 32          |

**Distribution of Marks for Generic Elective Course**  
**Marks including choice:**

| Unit | Marks |
|------|-------|
|      |       |
|      |       |
|      |       |
|      |       |

Table 9. Type of Questions & Marks for External Examination –Generic Elective Course

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Marks for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|---------------------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                                     | 5           |
| Short answer         | 5               | 3                               | 2                                     | 6           |
| Short essay/Problems | 5               | 3                               | 3                                     | 9           |
| Total                | 15              | 11                              |                                       | 20          |

### **Guidelines for the Evaluation of Projects**

1. Evaluation of the Project Report shall be done under Mark System.
2. The evaluation of the project will be done at two stages:
  - a) Internal Assessment (supervising teachers will assess the project and award Internal Marks)
  - b) External evaluation (external examiner appointed by the University)
  - c) Marks secured for the project will be awarded to candidates, combining the Internal and External Marks
3. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

| Internal(20% of total)        |                     | External( 80% of Total)                                                                     |                     |
|-------------------------------|---------------------|---------------------------------------------------------------------------------------------|---------------------|
| Components                    | % of internal Marks | Components                                                                                  | % of internal Marks |
| Punctuality                   | 20                  | Relevance of the topic, Statement of Objectives<br>Methodology<br>(Reference/ Bibliography) | 20                  |
| Use of Data                   | 20                  | Presentation, Quality of Analysis/Use of Statistical tools, Findings and recommendations    | 30                  |
| Scheme/Organization of Report | 30                  | Viva-voce                                                                                   | 50                  |
| Viva-Voce                     | 30                  |                                                                                             |                     |

4. Internal Assessment should be completed 2 weeks before the last working day of VI<sup>th</sup> semester.
5. Internal Assessment marks should be published in the department.
6. Project evaluation shall be done in the VI semester along with practical exams.
7. Chairman Board of Examinations, may at his discretion, on urgent requirements, make certain exception in the guidelines for the smooth conduct of the evaluation of project.

#### **2.PASS CONDITIONS-**

1. Submission of the Project Report and presence of the student for viva are compulsory for internal evaluation. No marks shall be awarded to a candidate if she/he fails to submit the Project Report for external evaluation.
2. The student should get a minimum of 40 % marks of the aggregate and 40% separately for ESE and 10% CE for pass in the project.
3. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re-done and the report may be re-submitted along with subsequent exams through parent department.

**CORE COURSE: I - THEORETICAL AND INORGANIC CHEMISTRY**

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| 1        | 1B01CHE     | 2                 | 2      | 3           |

**Course outcome**

**On successful completion of this course, students should be able to**

CO 1: Correlate the structure and behavior of atom

CO2: Differentiate the various chemical interactions in molecules through bonding concepts

CO3: Analyze and interpret the gradation in the properties of elements in the periodic table

CO4: Predict the nuclear transmutations

CO5: identify the role of radioactive materials in different applications

**Contact hours-36****UNIT: 1 ATOMIC STRUCTURE AND INTRODUCTION TO WAVE MECHANICAL CONCEPT (12 hrs)**

Bohr theory of atom – calculation of Bohr radius, velocity and energy of an electron. Atomic spectra of hydrogen . Limitations of Bohr theory- Classical mechanics – concept, failure.

Black body radiation- Planck's law of radiation. Photoelectric effect- Heisenberg's uncertainty principle and its significance, dual nature of electrons – Davisson and Germer's experiment. - de Broglie hypothesis - Schrodinger wave equation ( derivation not expected), - Postulates of quantum mechanics (brief study). Application of Schrodinger wave equation to particle in one dimensional box. – normalization of wave function. Quantum numbers - Shapes of orbitals - Aufbau, Pauli's and Hunds rule - Electronic configuration of atoms.

**UNIT: 2 CHEMICAL BONDING (9hrs)**

Ionic bond: General characteristics, types of ions-Factors effecting the formation of ionic compound - Lattice energy – Born- Lande equation with derivation - Madelung constant, Born Haber cycle and its application - Covalent bond - Valance bond theory and its limitations - Hybridization and shapes of simple molecules (BeF<sub>2</sub>, PCI<sub>3</sub>, SF<sub>6</sub>, CH<sub>4</sub>, CH<sub>3</sub>-CH<sub>3</sub>, CH<sub>2</sub>=CH<sub>2</sub>, CH≡CH) - VSEPR theory – Shape of molecules and ions (NH<sub>3</sub>, XeF<sub>6</sub>, ClF<sub>3</sub>, NH<sub>4</sub><sup>+</sup>, H<sub>3</sub>O<sup>+</sup>) - Molecular orbital theory - homodiatomic molecules and heterodiatomic molecules(HCl and NO)- LCAO method - Bond strength and bond energy -

Polarisation and Fajan's rule - Metallic bonding - Free electron and band theory- Fermi level, explanationsof metallic properties based on these theories - Weak chemical forces - Hydrogen bond andVander Waal's forces.

### **UNIT: 3 GENERAL PROPERTIES OF ELEMENTS (6hrs)**

Modern periodic law -long form periodic table

Periodicity in properties – Atomic, ionic, covalent radii – ionisation potential,electron affinity, – Electronegativity – Paulings, Mulliken, Allred Rochow's andMulliken-Jaffe Scale of lectronegativity. Radius ratio – Effective nuclear charge –Screening effect – Slater rules, Anomalous behaviour of 1st element of a group –diagonal relationship.

### **UNIT:4 NUCLEAR CHEMISTRY(9HRS)**

Radioactivity - rate of radioactive disintegration –half life- Nature of radiation from radioactive elements – stability of nucleus-binding energy-magic numbers-packing fractions-n/p ratio.

Detection and measurement of radioactivity - Gieger-Muller counter - Wilson cloud chamber. Radioactive tracers - Rock dating, Carbon dating - Artificial radio activity - Artificial transmutations of elements - cyclotrons - Induced radio activity - Q values of nuclear reactions - Nuclear reactors Nuclear fission and nuclear fusion - Classification of reactors - Breeder reactor - India'snuclear energy programme.

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- 3 Cotton F.A. and Wilkinson, *Advanced Inorganic Chemistry*, Wiley IndianPvt.Ltd., 2008.
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- 8 J.B.Rajam *Atomic Physics*, S.Chand and Co.Pvt.Ltd, 1974.
- 9.Selecteds Topics in Inorganic Chemistry ,Dr.Wahid .U. Malik,Dr. G.D. tuli, Dr. R.D. Madan,S.Chand Publications

**Distribution of Marks for External Examinations****Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 19    |
| II   | 17    |
| III  | 10    |
| IV   | 16    |

Table 8. Type of questions &amp; Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

**CORE COURSE III : ANALYTICAL AND INORGANIC CHEMISTRY – I**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>II</b>       | <b>2B03CHE</b>     | <b>2</b>                  | <b>2</b>      | <b>3</b>            |

**Course Out come**

**On successful completion of this course, students should be able to**

CO 1: Determine the error, standard deviation and relative standard deviation of analytical data.

CO 2: Understand statistical treatment of analytical data and the principles underlying volumetric titrations.

CO 3: Understand basic principles behind selective precipitation of cation.

CO 4: Summarize the characteristics of s- and p- block elements

CO 5: Compare the various concepts of acids and bases

**Contact hours-36****Unit:I Theoretical Aspects of Analytical Chemistry (7hrs)**

Terms used in evaluation of analytical data – significant figures – Rounding of the numerical expression – Errors – Ways to reduce systematic errors Precision and accuracy – Ways of expressing precisions – Average deviation from the mean - Standard Deviation – Relative standard deviation – Reporting of analytical data- Statistical treatment of analytical data – Population and samples – Confidence limit- Test of significance – students t-test, f-test - Q test for rejecting data.

**Unit:II Fundamentals of Volumetric Titrations and Qualitative Analysis(6hrs)**

Titrimetric analysis – Fundamental concepts – mole, molarity, normality, molality, ppm, and ppb, mole fraction–

primary standard – secondary standard -standard solutions – quantitative dilution –problems – theory of titrations involving acids and bases, theory of acid-base indicators, –

Permanganometry, dichrometry-redox indicators,

iodometry-iodimetry. Indicators – theory of adsorption indicators – complexometric titrations- EDTA titrations-titration curves-

Metal ion indicators.

Applications of solubility product and common ion effect in the precipitation of cations –

Interfering acid radicals and their elimination (oxalate, fluoride, borate, phosphate, chromate, arsenite and arsenate).

**Unit:III Chemistry of Representative Elements (14hrs)**

**Hydrogen** : Isotopes (separation method not needed) Ortho and para hydrogen. Hydrides and their classification.

**Alkali and alkaline earth metals:** Periodic properties of hydrides, oxides, halides, hydroxides and carbonates.

**P block elements**

Comparative study based on electronic configuration - periodic properties of Hydrides, Oxides, Halides, Carbides and Oxoacids. Inert pair effect. Metallic and non-metallic character- Acid-base properties of oxides. Exceptional behavior of second period element in the following groups of elements-Group 13 (B, Al, Ga, In and Tl).

Group 14 (C, Si, Ge, Sn and Pb) Group 15 (N, P, As, Sb and Bi). Group 16 (O, S, Se, Te and Po) and Group 17 (F, Cl, Br and I).

**Unit: IV Acids and Bases (9hrs)**

Concepts of Lowry and Bronsted – Lux – Arrhenius concept, flood concept – The solvent system concept – The Lewis concept – Relative strength of Acids and Bases – Effect of solvent – Leveling effect – Effect of polarity and substituents – Hard and soft acids and bases – Pearsons concept – Bonding in hard–hard and soft–soft combinations – HSAB principle and its applications – Basis for hard- hard and soft–soft interactions.

Classification of solvents – characteristic properties of a solvent – study of liquid ammonia, liquid HF and H<sub>2</sub>SO<sub>4</sub>.

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- 2 G.H. Jeffery, J. Bassett, J. Mendham, R.C. Denny, *Vogel's Text book of Quantitative Chemical Analysis*, 5th Edn., ELBS, 1989.
- 3 Vogel's *Text Book of Qualitative Analysis*
- 4 DA Skoog, DM West, *Analytical Chemistry, An Introduction*, 4th Edn., CBS Publishing Japan Ltd., 1986.
- 5 Puri, Sharma and Kalia, *Principles of Inorganic Chemistry*, Milestone Publishers and Distributors, 2008.
- 6 J.D.Lee, *Concise Inorganic Chemistry*, 5th edition , Oxford University Press, New Delhi 2008.
- 7 R.Gopal, *Inorganic Chemistry for undergraduates*, Universities press, India Pvt.Ltd, 2009.
- 8 P. L.Soni, *Text book of inorganic Chemistry*, S.Chand and Sons, 2007.
- 9 Shriver and Atkins, *Inorganic Chemistry*, W. H Freeman and Company, 2006.
- 10 Huheey J. E, *Inorganic Chemistry*, Prentice Hall 1993

**Distribution of Marks for External Examinations****Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 13    |
| II   | 12    |
| III  | 23    |
| IV   | 14    |

Table 8. Type of questions &amp; Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |



**CORE COURSE IV: ORGANIC CHEMISTRY – I**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>III</b>      | <b>3B04CHE/PCH</b> | <b>3</b>                  | <b>3</b>      | <b>3</b>            |

**Course Outcome**

**On successful completion of this course, students should be able to**

CO:1 ) Explain the types of electron displacement in organic molecules and predict the properties of molecules based on electron displacement effect

CO:2) Distinguish aromatic, anti aromatic and nonaromatic compounds and ions and analyse the mechanistic details of aromatic electrophilic substitution

CO:3) Classify stereo isomers, understand the property of chirality, apply CIP rules to recognize the configuration and explain the stability of conformations drawing energy profile diagram

CO: 4) Explain the mechanism of polymerization, synthesis and application of industrially important Polymers

CO: 5) Explain the classification and the methods of preparation of important dyes

CO: 6) Illustrate the preparative methods and synthetic applications of important synthetic reagents

**Contact hours-54**

**UNIT I- INTRODUCTION TO REACTION MECHANISM (12 HOURS)**

Representation of structural formulae -Bonding notations - Drawing electron movements with arrows- curved arrow notation

- Half headed and double headed arrows. Types of reagents – electrophiles and nucleophiles, Types of organic reactions,

Electronegativity- Polarity in bonds- Homolytic and Heterolytic bond fission - Reaction intermediates-Carbocations, Carbanions, Free radicals, Carbenes and Nitrenes - Their generation, Structure and stability. Methods of determination of reaction mechanism (product analysis, intermediates, isotope effects, kinetic and stereo chemical studies).

Electron displacement in organic molecules- inductive effect, Electromeric effect, Resonance or Mesomeric effect and Hyper conjugation- Steric effect- Tautomerism

Application of electron displacement effect in the order of acidity of Carboxylic acids, Phenol and Basicity of amines- Comparative basic strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine. - comparative basic strength of aniline, N- methylaniline and N,N-dimethyl aniline (in aqueous and non- aqueous medium), steric effects and substituent effects. Application of steric effect in the basicity of substituted aromatic amines -Explanation of Order of stability of carbonium ions, Free radicals, carbanions, carbenes.

[Type text]

**UNIT II-AROMATICITY (8 HOURS)**

Structure of Benzene -Aromaticity: Hückel's rule, aromatic character of arenes, cyclic carbocations/carbanions and heterocyclic compounds with suitable examples. - ferrocene-Annulenes. Aromaticity in higher annulenes .Anti aromaticity and homoaromaticity.

Mechanism of aromatic electrophilic substitution-Halogenation, Nitration and Sulphonation - Friedel -Craft's alkylation and acylation—Orientation and reactivity in monosubstituted benzene rings- Ortho/para ratio.

**UNIT III-STEREOCHEMISTRY: (15 HOURS)**

Fischer Projection, Newman and Sawhorse Projection formulae and their inter-conversions; Geometrical isomerism: cis-trans and, syn-anti isomerism

*Optical Isomerism:*Optical activity: Definition, wave nature of light, plane polarised light, optical rotation and specific rotation, chiral centers. Chiral molecules: definition and criteria - absence of plane, center and  $S_n$  axis of symmetry – asymmetric and dissymmetric molecules. Examples of asymmetric molecules (Glyceraldehyde, Lactic acid, Alanine) and dissymmetric molecules (trans-1,2-dichlorocyclopropane). optical isomerism in compounds without any stereo centers (allenes, biphenyls);

Molecules with constitutionally symmetrical chiral carbons (Tartaric acid) Molecules with constitutionally unsymmetrical chiral carbons (2,3-dibromopentane). D, L &, R, S configuration, Cahn-Ingold-Prelog rules.Racemic mixture, Racemisation and Resolution techniques. Geometrical isomerism with reference to alkenes and cyclo alkanes– cis, trans and E, Z configuration.

Conformational analysis :Definition and examples of conformational and configurational isomers.Types of cycloalkanes and their relative stability, Baeyer strain theory, Conformation analysis of alkanes- Conformational analysis of ethane, n-butane, 1,2-dichloroethane,2-chloroethanol - Relative stability: Energy diagrams of cyclohexane: Chair, Boat and Twist boat forms; Relative stability with energy diagrams., conformation of mono and disubstituted cyclohexane derivatives,

**UNIT IV- POLYMERS : (6 HOURS)**

Introduction and classification of polymers; Number average molecular weight, Weight average molecular weight, Polymerisation reactions -Addition and condensation -Mechanism of cationic, anionic and free radical addition polymerization; Ziegler-Natta polymerisation of alkenes; Preparation and applications of plastics - thermosetting (phenol-formaldehyde, Polyurethanes) and thermo softening (PVC, polythene –LDPE and HDPE) – polyamides, Polycarbonates, and silicone polymers. Rubbers - natural and synthetic: Buna-S, Chloroprene and Neoprene; Vulcanization; Polymer additives; Introduction to liquid crystal polymers; Biodegradable and conducting polymers with examples.

**UNIT V-DYES (5 HOURS)**

Synthetic Dyes : Colour and constitution- Chromophores and auxochrome. Classification of dyes, Synthesis of Methyl orange, Malachite green, and Alizarin.Edible Dyes with examples

**UNIT VI - SYNTHETIC REAGENTS ( 8 HOURS)**

Active methylene group- Preparation and synthetic application of Ethyl acetoacetate, - Preparation and synthetic application of Aluminium isopropoxide, N-Bromo Succinamide , Diazo methane and Wittig reagent. Reformatsky reaction and its application

## References

1. M. K. Jain and S. C. Sharma 'Modern Organic Chemistry', Visal Publishing Company Co.
2. K. S. Tewari and N. K. Vishnoi 'Organic Chemistry', Vikas Publishing House
3. B. S. Bahl 'Advanced organic Chemistry', S. Chand.
4. Peter Sykes, 'A Guide book to Mechanism in Organic Chemistry' , Pearson Education
5. P. S. Kalsi' 'Organic Reactions and their Mechanisms'' New Age International Publishers
6. R. T. Morrison and R. N. Boyd, 'Organic Chemistry', Prentice Hall of India
7. I. L. Finar, 'Organic Chemistry', Vol.- I, Pearson Education
8. Gowariker V.R., Viswanathan N.V. and Jayader Sreedhar,' Polymer Science', Wiley Eastern Ltd., New Delhi.
9. Billmeyer, F. W. Textbook of Polymer Science, John Wiley & Sons, Inc.4. Gowariker, V. R.; Viswanathan

## Further Reading

1. P. Y. Bruice, 'Organic Chemistry', Pearson Education.
2. J. March, 'Advanced Organic Chemistry', John Wiley & Sons, NY
3. S. H. Pine 'Organic Chemistry', McGraw Hill
4. J. Clayden, N. Greeves, S. Warren and P. Wothers, 'Organic Chemistry', Oxford University Press

**Distribution of Marks for External Examinations****Marks including choice:**

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 15    | V    | 5     |
| II   | 10    | VI   | 9     |
| III  | 16    |      |       |
| IV   | 7     |      |       |

## Type of questions &amp; Marks for External Examination

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

**CORE COURSE VI : ORGANIC CHEMISTRY – II**

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| 1V       | 4B06CHE/PCH | 3                 | 3      | 3           |

**Course Outcome**

**On successful completion of this course, students should be able to**

CO :1) Describe mechanisms for substitution and elimination reactions, and predict the effect of nucleophile, leaving group, and solvent on the relative rates of  $S_N1$  versus  $S_N2$  reactions, and  $E1$  versus  $E2$  reactions, as well as on the relative rates of substitution versus elimination.

CO 2) Explain Chugaev and Cope eliminations and  $E1CB$  mechanism

CO : 3) Illustrate the preparative methods and important properties of Hydro carbons, halogen compounds, Hydroxy compounds and Carbonyl Compounds

CO: 4) Explain the mechanism of important name reactions including rearrangements involving hydroxyl and Carbonyl functional groups

**Contact hours 54**

**UNIT I- MECHANISM OF ORGANIC REACTIONS (12 HOURS)**

Substrate and reagent- Electrophiles and nucleophiles- Aliphatic nucleophilic substitutions- mechanism of  $S_N1$ ,  $S_N2$ - Stereo Chemistry of  $S_N1$  and  $S_N2$  reaction- Walden Inversion- Effect of nucleophile, leaving group, and solvent on the relative rates of  $S_N1$  versus  $S_N2$  reactions

Elimination -  $E1$  and  $E2$  mechanism - mechanism of dehydration of alcohol and dehydrohalogenation of alkyl halides - Saytzeff rule and Hofmann's rule. Effect of nucleophile, leaving group, and solvent on the relative rates of  $E1$  versus  $E2$  reactions and on the relative rates substitution versus elimination.

$E1CB$  mechanism- Thermal elimination reactions- Chugaev and Cope elimination

Mechanism of Electrophilic addition of Hydrogen halides to Carbon- Carbon double bond-Markownikoff's rule - Kharasch effect (Free radical addition of  $HBr$  on unsymmetrical double bond)

**UNIT II - HYDROCARBONS****( 14 HOURS)**

Alkanes –Nomenclature, Preparation by Reduction of alkyl halides and Wurtz reaction and Kolbe's electrolytic method.

Alkenes - Nomenclature Preparation by dehydration of alcohols, dehydrohalogenation of alkyl halides, dehalogenation of vic dihalides and by Kolbe's electrolytic method.

Reactions- Hydrogenation, addition of halogens, halogen acid and water. Oxidation with  $\text{KMnO}_4$ ,  $\text{K}_2\text{Cr}_2\text{O}_7$  and Osmium tetroxide, Ozonolysis and polymerization.

Alkynes- Nomenclature Preparation by dehydrohalogenation of vic-dihalides and gem-dihalides, dehalogenation of tetrahalides and Kolbe's electrolytic method. Reactions- Addition of Hydrogen, Halogen, Halogen acid and water – oxidation using alkaline  $\text{KMnO}_4$ , Acidic  $\text{K}_2\text{Cr}_2\text{O}_7$  and Selenium dioxide, Ozonolysis, hydroboration-oxidation and Polymerization reactions specific to alkynes.

Dienes- Nomenclature-Conjugated, cumulated and isolated dienes with example, preparation of 1, 3 butadiene-by dehydration of diols. Reactions of 1, 3 butadiene - 1,2 and 1,4 additions, polymerization.

Polynuclear Hydrocarbons- Haworth Synthesis of naphthalene, synthesis of Anthracene from benzyl chloride.

Cycloalkane – Nomenclature- Methods of formation, chemical reactions, Baeyer's strain theory and its limitations. Ring strain in small rings (cyclopropane and cyclobutane).

### UNIT III - HALOGEN COMPOUNDS

(5 HOURS)

Halogen compounds: Nomenclature - Alkyl and Aryl Halides:

Classes of alkyl halides, Methods of formation and chemical reactions of gem and vic-dihalides, Polyhalogen compounds : Methods of formation of Carbon tetrachloride and Chloroform.

Aryl Halides *Preparation*: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions. Relative reactivity of alkyl, allyl /benzyl, vinyl and aryl halides towards nucleophilic substitution reactions., nucleophilic aromatic substitution;  $\text{S}_{\text{N}}\text{Ar}$  and Benzyne mechanism.

### UNIT IV - HYDROXY COMPOUNDS (8 HOURS)

Alcohols – Nomenclature, Preparation of monohydric alcohols from carbonyl compounds using Grignard reagents - Preparation with hydro-boration reaction, Ascent and Descent in alcohol series, Methods to distinguish  $1^\circ$ ,  $2^\circ$  and  $3^\circ$  alcohols - Lucas method, Victor Meyer's method and oxidation method .

Glycerol- Isolation from fats and oils ,Preparation from Propene- Reactions – a) Oxidation b) Reduction with HI, c) Dehydration d) Nitration e) Acetylation

Phenols - Acidic character of phenol - Preparation of phenol from i) diazonium salt, ii) aryl sulphonates, iii) cummene. Important reactions of Phenol - Bromination, Kolbe-Schmidt reaction, Rieme-Tiemann reaction, Hauben-Hoesch reaction, Gattermann-Koch reaction ,

$\text{FeCl}_3$  reaction.azo coupling.Naphthols- Preparation of Alpha and Beta Naphthols

Mechanism of following rearrangement reactions - a) Pinacol-Pinacolone rearrangement b) Fries rearrangement c) Claisen rearrangement.

### UNIT V - CARBONYL COMPOUNDS (15 HOURS)

Nomenclature of aldehydes and ketones - Preparation of aldehydes and ketones - Rosenmund's reduction, Stephen's reduction, Etard's reaction, Oppenauer oxidation, Houben - Hoesch synthesis. Reactions of aldehydes and ketones. Reduction using  $\text{LiAlH}_4$  and  $\text{NaBH}_4$  MPV,

[Type text]

Clemensen and Wolf-Kishner reduction. Reduction to pinacols - Oxidation using mild and strong oxidizing agents -  $\text{SeO}_2$  oxidation -

Reaction with alcohols, KCN, sodium bisulphite and derivatives of ammonia - Distinction between acetaldehyde and benzaldehyde and acetaldehyde and acetone.

Mechanisms of Aldol and Benzoin condensation, Knoevenagel condensation, Claisan-Schmidt, Perkin, Cannizzaro and Wittig reaction, Beckmann and Benzil-Benzilic acid rearrangements

Addition reactions of unsaturated carbonyl compounds: Michael addition.

#### References

1. M. K. Jain and S. C. Sharma 'Modern Organic Chemistry' 3rd Edition, Visal Publishing Company Co.
2. K. S. Tewari and N. K. Vishnoi 'Organic Chemistry', 3rd Edition, Vikas Publishing House
3. B. S. Bahl 'Advanced organic Chemistry', S. Chand.
4. R. T. Morrison and R. N. Boyd, 'Organic Chemistry', 6th Edition - Prentice Hall of India.
5. I. L. Finar 'Organic Chemistry', Vol.- 1, Pearson Education
6. P. S. Kalsi' 'Organic Reactions and their Mechanisms'' New Age International Publishers
7. Graham Solomons, T.W., Fryhle, C.B. & Snyder, S.A. *Organic Chemistry*, John Wiley & Sons (2014).
8. McMurry, J.E. *Fundamentals of Organic Chemistry*, 7th Ed. Cengage Learning India Edition, 2013.

#### Further Reading

1. P. Y. Bruice, 'Organic Chemistry', Pearson Education.
2. J. March, 'Advanced Organic Chemistry', John Wiley & Sons, NY
3. S. H. Pine 'Organic Chemistry', McGraw Hill
4. J. Clayden, N. Greeves, S. Warren and P. Wothers, 'Organic Chemistry', Oxford University Press

**Distribution of Marks for External Examinations****Marks including choice:**

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 14    | V    | 16    |
| 11   | 15    |      |       |
| III  | 5     |      |       |
| 1V   | 12    |      |       |

Table 8. Type of questions &amp; Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |



**CORE COURSE VII : ANALYTICAL AND INORGANIC CHEMISTRY-II**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B07CHE/PCH</b> | <b>3</b>                  | <b>4</b>      | <b>3</b>            |

**Course Outcome**

**On successful completion of this course, students should be able to**

CO: 1 Understand the qualitative and quantitative aspects of analysis and separation techniques

CO: 2 Explain instrumentation and working principle of different analytical techniques –TGA, DTA and radio chemical method of analysis.

CO: 3 Familiarize with the preparation, properties and uses of some inorganic compounds like hydrides of boron, sulphur and silicon based inorganic polymers and understand their importance

CO :4Explain the classification of refractories.

CO :5Knowthe position, electronic configuration and physical properties of noble gases and explain hybridization and geometry of different xenon compounds

CO :6Explain various steps involved in metallurgical operations and power metallurgy and understand Corrosion, theories of Corrosion and factors affecting Corrosion

**SEMESTER V  
ANALYTICAL AND INORGANIC CHEMISTRY-II**

**Contact hours:54**

**Unit: I -Principles of Gravimetric Analysis and Separation-Chemistry. (9hrs)**

**Gravimetric analysis** – unit operations in gravimetric analysis.

. **Precipitation:** Conditions of precipitation – co precipitation and post precipitation

Principle of gravimetric estimation of iron and nickel

**Chromatography** -Basic principle, Column chromatography – Adsorption column chromatography and Partition column chromatography - Ion exchange chromatography -Ion exchange resins.

Thin layer chromatography--preparation of chromatoplate- running a thin layer chromatogram- location of spots.

Brief introduction on Gel chromatography and paper chromatography-

**Solvent extraction:** Principle – factors affectin solvent extraction- factors favouring solvent extraction different types-batch, continuous, counter current

**Unit: II- Instrumental Techniques in Analytical Chemistry (9hrs)**

Thermogravimetric analysis – introduction – instrumentation – factors affecting TGA – application of TGA. Differential thermal analysis – introduction – instrumentation – principle of working – factors affecting DTA – application. Thermometric titrations – a brief study.

[Type text]

Radio chemical methods of analysis – introduction – activation analysis – a brief study.

Neutron diffraction – theoretical aspects – thermal neutron – instrumentation – application.

### **Unit: III- Industrially important Inorganic compound (9hrs)**

Structure ,properties and uses of:

Hydrides of boron – B<sub>2</sub>H<sub>6</sub> and B<sub>4</sub>H<sub>10</sub>(preparation also). Borazine, Boric acid, oxoacids of halogens,

Inter halogen compounds, Pseudo halogens, Fluorocarbons.

#### **Inorganic polymers**

Phosphorous based, sulphur based and silicon based - silicones and silicates - polymers.

#### **Refractories**

Introduction- classification- super refractories - silicon carbide.Pure oxide refractories.

### **Unit: IV-Chemistry of Noble Gases(9hrs)**

Discovery of noble gases. Electronic configuration and position in the periodic

table. General physical properties, uses of noble gases. Compounds of noble gases–

Clathrates, compounds of Xenon—XeF<sub>2</sub>, XeF<sub>4</sub>, XeF<sub>6</sub>, XeO<sub>2</sub>F<sub>2</sub> , XeOF<sub>2</sub>, XeOF<sub>4</sub> and XeO<sub>3</sub>.

hybridization and geometry of these compounds. Fluorides of Krypton and Radon.

### **Unit: V- Metallurgy(9hrs)**

Occurrence of metals.Various steps involved in metallurgical processes. Electrometallurgy, Hydrometallurgy.

Coinage metals-Occurrence and extraction of copper, silver and gold.

Powder metallurgy(brief discussion). Alloy steels- composition of alloy steels-application of alloy steels. Heat treatment

of steel. Nonferrous alloys and their uses.

### **UNIT VI .Corrosion and corrosion control (9hrs)**

Introduction..Causes of corrosion.types and Theories of corrosion-(Direct chemical attack or dry corrosion. Electrochemical theory or wetcorrosion. Peroxide theory,acid theory ,oxide theory)

.Differential Aeration or concentration cell corrosion.

Factors influencing corrosion- nature of the metal- nature of the environment.Corrosion control.

References :

1.B R Puri, L R Sharma, K C Kalia, *Principles of Inorganic Chemistry*,Milestone publishers, New Delhi.

2. D A Skoog, D M West and S R Crouch, *Fundamentals of Analytical Chemistry*, 8th Edition, Brooks/Cole Nelson (Chapter 12-17).

3. Vogel's *Text Book of Quantitative Chemical Analysis*, 6th Edition,Peasons education limited.

4. Vogel's *Text Book of Qualitative Analysis*

5. G D Christian, *Analytical Chemistry*, John Wiley and Sons..

6. J.D Lee, *Concise inorganic chemistry*, Blackwell Science, London

7. Jain & Jain, *Engineering Chemistry*, Dhanpat Rai Publishing Company.

[Type text]

8. Chatwal and Anand, *Instrumental methods of chemical analysis*.
9. A K Srivastava, P C Jain, *Instrumental approach to chemical analysis*. S Chand.
10. H. Kaur, *Instrumental methods of chemical analysis*, PragatiPrakashan, Meer
11. Emelus and Anderson, *Principles of Inorganic Chemistry*.
12. R. P. Budhiraja, *Separation Chemistry*, Second edition, New age international publishers
13. Dr. S.K. Agarwala and Dr. Keemtilal, *Advanced Inorganic Chemistry*.
14. B.K. Sharma, *Industrial Chemistry*

### Distribution of Marks for External Examinations

#### Marks including choice:

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 11    | V    | 10    |
| II   | 11    | VI   | 9     |
| III  | 11    |      |       |
| IV   | 10    |      |       |

Table 8. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

**CORE COURSE VIII : INORGANIC CHEMISTRY**

| <b>SEMESTER</b> | <b>COURSE CODE</b>  | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|---------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B08 CHE/PCH</b> | <b>3</b>                  | <b>4</b>      | <b>3</b>            |

**Course Outcome**

**On successful completion of this course, students should be able to**

CO:1) Understand the behavior of transition and inner transition elements and explain the separation of lanthanides by ion exchange method and lanthanide contraction

CO: 2) Understand key features of co-ordination compounds and illustrate the theories of coordination complexes, stability of complexes and explain factors affecting crystal field splitting.

CO: 3) Explain biological functions of metal ions.

CO: 4) Familiarize new elements in periodic table and Understand recent developments in inorganic chemistry.

**SEMESTER V****INORGANIC CHEMISTRY**

**Contact hours:54**

**UNIT I. TRANSITION AND INNER TRANSITION ELEMENTS.(14hrs).**

General properties of transition elements – Electronic configurations, Oxidation states, colour, magnetic properties, tendency to form complexes and catalytic properties.

Comparison of first transition series with second and third series.

**Lanthanides** – Occurrence , separation by ion - exchange chromatography. Electronic configurations, oxidation states, magnetic properties and spectra of lanthanides. Lanthanide Contraction—causes and consequences.

**Actinides** :Electronic configurations, oxidation states, spectra and magnetic properties. Transition actinide elements – Preparation, IUPAC nomenclature.

Comparison of transition and inner transition elements

**UNIT II. COORDINATION CHEMISTRY- I (9hrs)**

Introduction-Double salts and Coordination compounds. Nomenclature. Effective Atomic Number (EAN). Shapes of d orbitals.-Types of ligands.Chelates. Stereo chemistry of coordination compounds with coordination numbers 2 to 6. Isomerism. Stability of complex ions-stability constant. Factors affecting the stability of complexes. Application of complex formation in qualitative and quantitative analysis.

[Type text]

**UNIT III.COORDINATION CHEMISTRY- II (9hrs)**

Theories of bonding in transition metal complexes– Valence bond theory . Application to some complexes-Hybridization in tetrahedral, square planar and octahedral complexes – explanation of magnetic properties based on VBT. Limitations of VBT. Crystal field theory-Crystal field splitting in octahedral, tetrahedral and square planar geometries. Factors affecting the magnitude of crystal field splitting. Crystal field stabilization energy(CFSE). Explanation of colour, spectral and magnetic properties . Spectrochemical series.

**UNIT IV. BIOINORGANIC CHEMISTRY(9hrs)**

Myoglobin and Haemoglobin - Structure and functions of haemoglobin and myoglobin. Cooperativity effect.Bohr effect,. Metallo enzymes of iron and zinc (structural details not needed). Metal ion transport across cell membrane – sodium/potassium pump. Biological functions of Co, Mn, Zn,Mg and Ca and toxicity of -,As, Cd, Pb, Hg .Biological fixation of nitrogen.

**UNIT V. ORGANOMETALLIC COMPOUNDS (9hrs)**

Introduction. Classification based on the nature of metal-carbon bond. Preparation ,structure - valence bond theory - of mononuclear (Ni,Fe), binuclear (Fe,Mn,Co) and trinuclear (Fe) metal carbonyls - Application of 18 electron rule to predict M-M bond. Preparation, properties, structure and bonding of Ferrocene.

**UNIT VI . RECENT ADVANCES IN INORGANIC CHEMISTRY ( 4Hrs)**

New elements in periodic table :Elements with atomic numbers-113,115,117,118. -Note on discovery and naming of these elements  
Elementary idea on : Graphene and borophene - Shape memory alloys- Mxenes- geopolymers.

**REFERENCES**

1. D. F. Shriver and P.W. Atkins, Inorganic Chemistry 3rd edn., Oxford University Press.
2. R. C. Mehrothra and A. Singh, Organometallic chemistry, New age publishers.
3. J. E. Huheey, E. A. Keiter, R. L. Keiter, O K Medhi, Inorganic Chemistry, Pearson.
4. B. R. Puri, L. R. Sharma, K. C. Kalia, Principles of Inorganic Chemistry, Milestone Publishers, New Delhi.
5. F. A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry 5th edn., John Wiley, New York.
6. J. D. Lee, Concise Inorganic Chemistry 5th edn., Blackwell Science, London.
7. R.A. Mackay, W. Henderson, Introduction to Modern Inorganic Chemistry, 6th edition . Nelson Thornes Ltd.

**Internet links for reference:**

1. <https://iupac.org/iupac-is-naming-the-four-new-elements-nihonium-moscovium-tennessine-and-oganesson/>
2. [https://iupac.org/wp-content/uploads/2016/06/Press-Release\\_Naming-Four-New-Elements\\_8June2016.pdf](https://iupac.org/wp-content/uploads/2016/06/Press-Release_Naming-Four-New-Elements_8June2016.pdf)
3. <http://www.rsc.org/periodic-table/>
4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4922135/>
5. <https://phys.org/news/2018-12-borophene-advances-d-materials-platform.html>
6. <https://www.geopolymer.org/science/introduction/>
7. <https://nano.materials.drexel.edu/research/synthesis-of-nanomaterials/mxenes/>
8. <https://ceramics.org/ceramic-tech-today/basic-science/research-on-mxenes-expand-and-so-do-the-mxenes>
9. <https://www.sciencedirect.com/topics/materials-science/shape-memory-effect>

**Distribution of Marks for External Examinations****Marks including choice:**

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 15    | V    | 10    |
| II   | 11    | VI   | 2     |
| III  | 13    |      |       |
| IV   | 11    |      |       |

Table 8. Type of questions &amp; Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

**CORE COURSE IX : PHYSICAL CHEMISTRY I**

| <b>SEMESTER</b> | <b>COURSE CODE</b>  | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|---------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B09 CHE/PCH</b> | <b>3</b>                  | <b>4</b>      | <b>3</b>            |

**Course outcome**

**On successful completion of this course, students should be able to**

CO1) Recognize and relate the properties of ideal and real gases

CO2 ) Describe the properties of liquids.

CO3) Identify and distinguish the types of solutions

CO4) Explain colligative properties of dilute solution and determine the molecular weight of a solute

CO 5) Identify different crystallographic systems and various types of crystal defects

CO 6) Describe X ray diffraction to explain internal structure of solids

**Contact hrs 54**

**UNIT 1 The Properties of Gases (15 hrs)**

Gas laws – The general gas equation– The Kinetic model of gases – gas laws from the kinetic theory of gases ---Molecular Speeds – Maxwell’s distribution of molecular speeds – Most probable velocity, average velocity and root mean square velocity — Collision diameter – Mean free path, Collision number and collision frequency – Degrees of freedom of a gaseous molecule – Principle of equipartition of energy and contribution towards heat capacity of an ideal gas. Real gases – Molecular attractions – The compressibility factor – virial equation of state – Van der waals equation expressed in virial form – calculation of Boyle’s temperature – Isotherm of real gases and their comparison with Van der waals isotherms – continuity of states – critical phenomenon – critical constants of a gas and its determination, derivation of relationship with vander waal constants.

–Determination of molecular mass by limiting density method – Principle of corresponding states – Liquefaction of gases by Joule Thomson effect.

**UNIT 2 Liquid State (7hrs)**

Theories of Liquids state, Vacancy Theory and Free volume theory- Properties of liquids– vapour pressure, Heat of vapourisation, Trouton’s Rule ,Surface tension and its determination by capillary rise method and by using stalognometer – Interfacial tension – surface active agents –effect of temperature on surface tension- Parachor and its applications – Viscosity - determination of coefficient of viscosity and its variation with temperature – refractive index – specific and molar refraction – Measurement of refractive index – Abbe’s refractometer – optical activity and its measurement using Polarimeter.

[Type text]

**UNIT 3 Solid State (16 hrs)**

Amorphous and crystalline solids – Laws of crystallography – Law of constancy of interfacial angles – Law of constancy of symmetry – Law of rationality of indices – space lattice and unit cell – Miller indices – seven crystallographic systems – Bravais lattices – Spacing of lattice planes in simple cubic, body centred and face centred cubic systems – Number of particles per unit cell in each of these - Calculation of Avogadro number, density and molecular mass from crystallographic data. Determination of internal structure of crystals by X-ray diffraction methods – derivation of Bragg's equation – Bragg's rotating crystal method and Debye Scherrer Powder diffraction method – Crystal structure of NaCl – anomalous nature of diffraction pattern of KCl. Co-ordination Number – Efficiency of packing – Cubic and Hexagonal packing – Radius ratio rule – Tetrahedral and Octahedral voids. Liquid crystals – types – Examples – applications . crystal defects-point defects-Schottky and Frenkel defects-non stoichiometric defects.

**UNIT 4 Solutions (16 hrs)**

Types of solutions and methods for expressing concentration – Liquid systems — Completely miscible- Ideal and non- ideal solutions – Raoult's Law – Vapour pressure – composition diagrams-Azeotropic mixtures– Temperature – composition curves – Partially miscible liquids – Upper and Lower Critical solution temperature – Immiscible liquids – Steam distillation – Molar mass from steam distillation – Dilute Solutions Colligative properties – Lowering of vapour pressure and Raoult's law – Calculation of molar mass. Elevation of boiling point – relation to lowering of vapour pressure – Thermodynamic derivation – Calculation of molar mass – Depression of freezing point – Thermodynamic derivation – Calculation of molar mass – Measurement by Beckmann's method – Osmotic pressure – Measurement by Berkeley and Hartley's method – Laws of Osmotic pressure – Van't Hoff equation – Calculation of molar mass – Abnormal molar mass – Van't Hoff factor – Degree of dissociation and association and their calculation from colligative properties. Gas Liquid system — Henry's Law

## References

1. Physical Chemistry : P.W. Atkins, Oxford University Press
2. Physical Chemistry : Puri, Sharma and Pathania, Vishal Publishing Co.
3. A Text book of Physical Chemistry: A S Negi and S C Anand, New Age International Publishers.
4. A Textbook of Physical chemistry: K. L. Kapoor, Volume 1, Macmillan India Ltd
5. Text book of Physical Chemistry : Samuel Glasstone, McMillan Press Ltd.
6. Advanced Physical Chemistry: Gurdeep Raj, Goel Publishing House, Meerut.
7. Physical Chemistry: W.J. Moore, Orient Longmans.
8. Physical Chemistry: N. Kundu & S.K. Jain, S.Chand & Company
9. Solid state chemistry and its applications-Antony. R .West

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10. Solid state chemistry by Lesley E. Smart and Elaine A. Morre

11. Introduction to solids Leonid V Azaroff

### **Distribution of Marks for External Examinations**

#### **Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 17    |
| II   | 9     |
| III  | 18    |
| IV   | 18    |

Table 8. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

**CORE COURSE X : PHYSICAL CHEMISTRY II**

| <b>SEMESTER</b> | <b>COURSE CODE</b>  | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|---------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5B10 CHE/PCH</b> | <b>3</b>                  | <b>4</b>      | <b>3</b>            |

**Course outcome**

**On successful completion of this course, students should be able to**

CO 1) Identify the fundamental concepts of thermodynamics

CO2) Relate and Interpret the various laws of thermodynamics

CO3) Understand the concept of entropy and how the whole universe is related to it.

CO 4) Construct phase diagrams and study the equilibrium exists between various states of matter. and apply principles phase diagram to separation processes and for property modification of different type of system.

CO 5) Understand basic principles of surface chemistry and its application in various fields

CO 6) Correlate the types of colloids with its properties and to explore the applications in day todaylife.

**Contacthrs54****UNIT 1 Thermodynamics-I (15hrs)**

Basic concepts -- study of terms -- system and surroundings -- open, closed and isolated systems, isothermal, isochoric – adiabatic systems- state and state variables -- macroscopic properties – intensive and extensive properties – isothermal, adiabatic, isochoric and isobaric processes -- reversible and irreversible processes – work , heat and energy – state functions and path functions – exact and inexact differentials with notations – internal energy and enthalpy --- zeroth law of thermodynamics – concept of temperature. statement of first law of thermodynamics – conservation of energy  
– expansion work – general expression for work – work done during free expansion, expansion against constant pressure and isothermal reversible expansion – Heat capacity of gases at constant volume  $C_v$  and constant pressure  $C_p$  – relation between  $C_p$  and  $C_v$  and its derivation –  $P, V, T$  relations during adiabatic process -- work done during reversible adiabatic expansion-comparison for isothermal and adiabatic process -- Change in enthalpy at constant pressure -- Joule Thomson effect -- internal pressure -- inversion temperature.

Thermochemistry – standard enthalpy changes for physical and chemical changes – enthalpy of neutralisation, transition, formation, phase changes, combustion and solution- heats of reaction at constant volume  $q_v$  and constant pressure  $q_p$  – relation between  $q_p$  and  $q_v$  – Hess's law and its

applications – bond energy calculations – variation of enthalpy change of a reaction with temperature – Kirchoff equation.

## UNIT 2 Thermodynamics –II(12hrs)

Limitations of first law – cyclic process – Carnot cycle – efficiency of heat engine – statement of second law of thermodynamics in terms of work and heat – Clausius, Kelvin Planck statement – concept of entropy – physical significance of entropy (microscopic) – variation of entropy of ideal gases with pressure and temperature – second law in terms of entropy – entropy change for phase transitions – criteria for spontaneous changes – for isolated system at constant (T&V), (T&P), (S&V), (S&P) – Gibbs and Helmholtz free energies – condition of spontaneity in terms of free energy – comparison of entropy and free energy – Gibbs-Helmholtz equation – Maxwell relations

– Partial molar properties – concept of free energy – Gibbs Duhem equation – variation of chemical potential with temperature and pressure ..Chemical potential of a component in a mixture of ideal gases – Clapeyron equation – Clausius- Clapeyron equation for all phase equilibria – concept of fugacity.

Third law of thermodynamics – Nernst heat theorem – absolute entropy – calculation of absolute entropies.

## UNIT 3 Chemical Equilibrium(8 hrs)

Law of mass action – equilibrium constant – Relation between  $K_p$ ,  $K_c$  and  $K_x$  – Thermodynamic treatment of the law of mass action – Vant Hoff reaction isotherm – Temperature dependence of the equilibrium constant – The Van't Hoff's isochore – Pressure dependence of the equilibrium constant  $K_p$  – Study of heterogeneous equilibria – Factors that change the state of equilibrium – Le – chatelier's principle and its application to chemical and physical equilibria. Mention homogeneous gaseous equilibria having zero, positive and negative values of  $\Delta n$ . Calculation of degree of dissociation and  $K_p$ . Heterogeneous equilibria – Dissociation of solid calcium carbonate and decomposition of solid  $\text{NH}_4\text{HS}$ .

## UNIT 4 Phase Rule (10 hrs)

Statement of phase rule and explanation of terms (component, degree of freedom, phase) – thermodynamic derivation – one component systems – water system and sulphur system (including meta stable equilibrium) – two component systems – reduced phase rule – simple eutectic systems – lead-silver system – desilverisation of lead – KI – water system – freezing mixtures – systems involving the formation of compounds with congruent and incongruent melting points. – ferric chloride water system and  $\text{Na}_2\text{SO}_4$  water system. – solid-gas equilibria – decomposition of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ . – deliquescence and efflorescence. – Nernst distribution law. thermodynamic derivation and derivation from phase rule. Limitations – modifications under special conditions. – applications of distribution law to study association and dissociation of salts, solvent extraction, hydrolysis of salts and equilibrium constant of the reaction  $\text{KI} + \text{I}_2 = \text{KI}_3$ .

## UNIT 5 Colloids, Surface Chemistry (9 hrs)

Colloids, Classification – preparation – structure and stability – The electrical double layer – Zeta potential (no derivation) – Properties of Colloids – Tyndall effect – Brownian movement – Coagulation of colloidal solution – Hardy – Schulze rule – Flocculation value – Electro kinetic properties – Electrophoresis – Electro-osmosis – Protective colloids – Gold number – Emulsion –

Oil in water emulsion and water in oil emulsion – Emulsifying agents – Gels – Micelles – CMC – Donnan membrane equilibrium (basic idea only)

Physical and chemical adsorption – Adsorption isotherms – Freundlich adsorption isotherm – effect of temperature on adsorption – Langmuir adsorption isotherm -thermo dynamic derivation – use and limitation. B.E.T. equations (B.E.T. no derivation) – Gibbs adsorption equation (no derivation) – Surface films - Determination of surface area using Langmuir equations.

## References

1. Physical Chemistry : P.W. Atkins, Oxford University Press
2. Physical Chemistry : Puri, Sharma and Pathania, Vishal Publishing Co.
3. A Text book of Physical Chemistry: A S Negi and S C Anand, New Age International Publishers.
4. A Textbook of Physical chemistry: K. L. Kapoor, Volumes 2 &3, Macmillan India Ltd
5. Text book of Physical Chemistry : Samuel Glasstone, McMillan Press
6. Advanced Physical Chemistry: Gurdeep Raj, Goel Publishing House, Meerut.
7. Physical Chemistry: W.J. Moore, Orient Longmans.
8. Physical Chemistry: N. Kundu & S.K. Jain, S.Chand & Company.
9. Chemical Thermodynamics: J.Rajaram and J.C.kuriacose, Pearson.
10. Physical Chemistry: A Molecular Approach by Donald A Mc Currie
11. Physical chemistry by G W Castellan.

## Distribution of Marks for External Examinations

### Marks including choice:

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 17    | V    | 10    |
| II   | 14    |      |       |
| III  | 9     |      |       |
| IV   | 12    |      |       |

Table 8. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

**CORE COURSE XIV: ORGANIC CHEMISTRY - III**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B14CHE/PCH</b> | <b>4</b>                  | <b>4</b>      | <b>3</b>            |

**Course Outcome**

**On successful completion of this course, students should be able to**

CO1 Acquaint with the classification, structures and properties of carbohydrates, explain the configuration of glucose and fructose, their inter conversion, illustrate Killiani-Fischer synthesis and Ruff degradation

CO2 Illustrate the preparative methods and the properties of different classes of organic acids, nitrogen containing compounds and heterocyclic compounds.

CO3 Classify amino acids and peptides and explain the synthesis of simple peptides by *N*-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid-phase synthesis. Explain the methods of determination of primary structure of peptides

CO4 Distinguish the components of nucleic acids and lipids and their roles in biological system and the biological importance of various natural products. Familiarise with important drugs and their therapeutic applications

CO 5 Recognise the types and characteristics of pericyclic reaction and analyse the pericyclic reactions by FMO methods. Understand the photochemistry of carbonyl compounds

CO 6 Understand the principles of Green Chemistry and the importance of green synthesis and recognize the impact of green chemistry on human health and the environment

**72 HOURS****UNIT 1 CARBOHYDRATES (12 HOURS)**

Occurrence, classification and functions of carbohydrates. Monosaccharide: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversion of Monosaccharides: Aldopentose to Aldohexose (Arabinose to D- Glucose, D- Mannose) (Killiani - Fischer method). Epimers, Epimerisation – Aldohexose to Aldopentose (D- Glucose to D- Arabinose) by Ruff degradation. Aldohexose to Ketohexose [(+) Glucose to (-) Fructose] and Ketohexose to Aldohexose (Fructose to Glucose)

Structure of disaccharides (sucrose, maltose, lactose) and polysaccharides (starch and cellulose) excluding their structure elucidation. Colour tests for carbohydrates

[Type text]

**UNIT II -CARBOXYLIC ACIDS (7 HOURS)**

Carboxylic acids - Nomenclature - Preparation and reactions of acrylic and crotonic acids. Preparation and reactions of Hydroxy acids - lactic acid, tartaric acid and citric acid. Dicarboxylic acids - Preparation and reactions of malonic, succinic, maleic and fumaric acids - Blanc's rule. Preparation and reactions Aromatic acids - Benzoic acid, Phthalicacids, anthranilic acid, salicylic acid, cinnamic acid

**UNIT III - NITROGEN CONTAINING COMPOUNDS- (9 HOURS)**

Nitro compounds – Nomenclature , General methods of preparation- (From alkane, alkyl halides, and halogeno carboxylic acid) . Preparation of Nitro benzene, Reduction, Electrophilic substitution, Nucleophilic substitution.

Cyanides and isocyanides- Nomenclature - General methods of preparation.

Amines –Preparation – From Alkyl halide, Nitro Compounds, Nitriles, Hoffman Bromamide reaction, Curtius reaction, Schmidt reaction, reduction of Alkyl isocyanide, Preparation of tertiary amine.

Chemical reaction- Acylation, Benzoylation, Diazotisation, Reactions of diazonium salt, Carbyl amine reaction, Hoffman's exhaustive methylation , Hoffman's elimination ,Mannich reaction, Ring substitution, Separation of mixture by Hinsberg method , Hoffmann's tests for amine.

**UNIT IV AMINO ACIDS, PROTEINS AND NUCLEIC ACIDS (12 HOURS)**

Classification of amino acids- $\alpha$ -Amino Acids - Synthesis - Gabriel, Strecker and Erlemeyer synthesis, ionic properties and reactions. Zwitterions,  $pK_a$  values, isoelectric point and electrophoresis;

Overview of Primary, Secondary, Tertiary and Quaternary Structure of proteins. Determination of Primary structure of Peptides by degradation - Edman degradation (N-terminal) and C-terminal (thiohydantoin and with carboxypeptidase enzyme). Synthesis of simple peptides (upto dipeptides) by *N*-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid-phase synthesis. Denaturation of proteins.

Components of nucleic acids, Nucleosides and nucleotides;

Structure of: Adenine, Guanine, Cytosine, Uracil and Thymine; synthesis of Adenine and thymine . Structure of DNA (Watson-Crick model) and RNA (types of RNA), Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation.

**UNIT V INTRODUCTION TO NATURAL PRODUCTS ( 6 HOURS)**

Alkaloids- Introduction- Properties and structure of Coniine, Nicotine and Quinine- Structural elucidation of Nicotine. Medicinal importance of Nicotine, Quinine, Morphine, Cocaine, and Reserpine.

Steroids- General characteristics and structure of cholesterol, Testosterone and Oestrone.

Vitamin- Water soluble and fat soluble vitamins . Synthesis of Vitamin C

Terpenes- Definition- Isoprene rule- Occurrence, isolation and structural elucidation of Citral

- natural rubber

Lipids : Introduction to oils and fats; common fatty acids present in oils and fats, Hydrogenation of fats and oils, Saponification value, acid value, iodine number.

#### **UNIT VI HETEROCYCLIC COMPOUNDS (7 HOURS)**

Classification and nomenclature, Structure and aromaticity in 5-numbered and 6-membered rings containing one heteroatom - Separation, properties and structure of the following compounds- Pyrrole, Pyridine, Indole, Quinoline, Isoquinoline - Relative basic character of Pyrrole, pyridine and piperidine- Hofmann's exhaustive methylation of piperidine.

#### **UNIT VII - PHARMACEUTICAL COMPOUNDS:( 7HOURS)**

Classification of drugs - Antibiotics- Discovery and importance, mode of action and examples- Misuse of antibiotics- antibacterial and antifungal agents- Sulpha drugs-mode of action-Importance- Examples and uses. Synthesis of Sulphacetamide. Antipyretics & analgesic and anti inflammatory agents - Mode of action. Narcotic and non narcotic analgesic, examples and uses. Synthesis of Paracetamol and Aspirin -Anti histamine-example. CNS Drugs – Synthesis of Phenobarbital , Psychoactive drugs – Hallucinogens, tranquilizers, Examples.

#### **UNIT VIII PHOTOCHEMISTRY AND PERICYCLIC REACTIONS (7 HOURS)**

Introduction to photochemistry- Photochemical reactions of carbonyl compounds - Norrish type I and II cleavages (Acyclic only)-Photo reduction of ketone

Concerted reactions, Molecular orbitals of ethene, 1,3-butadiene and allyl radical. Symmetry properties, HOMO, LUMO, Thermal and photochemical pericyclic reactions.Types of pericyclic reactions – electrocyclic, cycloaddition and sigmatropic reactions – one example each and their explanation by FMO theory.

#### **UNIT IX GREEN CHEMISTRY (5 HOURS)**

Need for Green chemistry - Goals of green chemistry - Limitations.

Twelve principles of green chemistry with their explanations and examples - Designing a green synthesis - Prevention of waste / byproducts - Atom economy (maximum incorporation of materials used in the process) - Minimization of hazardous / toxic products. Green synthesis - Microwave assisted reactions in water - Hoffmann Elimination - Microwave assisted reaction in organic solvent - Diels Alder reaction, Ultrasound assisted reaction -Esterification, Saponification.Green chemistry in day to day life.

References

1. M. K. Jain and S. C. Sharma 'Modern Organic Chemistry', Visal Publishing Company Co.
2. K. S. Tewari and N. K. Vishnoi 'Organic Chemistry', Vikas Publishing House
3. B. S. Bahl 'Advanced organic Chemistry', S. Chand.
4. R. T. Morrison and R. N. Boyd, 'Organic Chemistry', Pearson Education.

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5. I. L. Finar Organic Chemistry, Vol.- II, Pearson Education
6. M.S. Yadav, 'Synthetic drugs'
7. V.K. Ahluwalia, M. Kidwai 'New trends in Green Chemistry', Anamaya Publishers.
8. V. Kumar, 'Introduction to Green Chemistry', Vishal Publishing House. Further Reading  
Further reading
1. P. Y. Bruice, 'Organic Chemistry', Pearson Education.
2. J. March, 'Advanced Organic Chemistry', John Wiley & Sons, NY
3. S. H. Pine 'Organic Chemistry', McGraw Hill
4. J. Clayden, N. Greeves, S. Warren and P. Wothers, 'Organic Chemistry', Oxford University Press

### Distribution of Marks for External Examinations

#### Marks including choice:

| Unit | Marks | Unit | Marks | Unit | Marks |
|------|-------|------|-------|------|-------|
| I    | 10    | V    | 5     | IX   | 4     |
| II   | 6     | VI   | 5     |      |       |
| III  | 8     | VII  | 6     |      |       |
| IV   | 10    | VIII | 8     |      |       |

Table 8. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be Answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |



**CORE COURSE XV: PHYSICAL CHEMISTRY - III**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B15CHE/PCH</b> | <b>4</b>                  | <b>3</b>      | <b>3</b>            |

**Course outcome**

**On successful completion of this course, students should be able to**

CO 1) Understand the mechanism of electrical conductance, theories of electrical conductance, and conductometric titrations

CO 2) Understand the basic principle of ionic equilibrium and its application in laboratories

CO 3) Design different types of electro chemical cell and able to calculate its potential.

CO 4) Familiarise with electro analytical methods

CO 5) Acquaint with kinetics of simple, complex, enzymatic and surface reactions

CO6) Understand basic principles of photochemistry and its application in spectrophotometry

**Contact hours -72**

**UNIT 1 Electrical Conductance (16 hrs)**

Mechanism of electrical conduction – Arrhenius theory – The laws of electrolysis – Faraday’s law and its significance – Transference Number – True and apparent transport numbers- Determination by Hittorf’s method and moving boundary method. Equivalent conductance and Molar conductance -Effect of Dilution on conductance – Effect of dielectric constants of solvents – Ionic mobilities – Kohlrausch’s Law – applications – Mobilities of Hydrogen and Hydroxyl ions – Diffusion and ionic mobility. Activity and activity coefficient – standard state ionic activities and activity coefficient – ionic strength – Debye – Huckel Theory – Ionic atmosphere – Debye – Huckel limiting law – Temperature dependence of ionic conductance-Debye-Falkenhagen effect-wein effect(definition only)- determination of solubilities by conductance measurements – conductometric titrations – conductance in non-aqueous solvents.

**UNIT 2 Ionic Equilibria (10 hrs)**

Ionic product of water – Dissociation constants of acids and bases – pH and its determination – Heat of neutralization – Incomplete neutralization – Hydrolysis of different types of salts – Degree of hydrolysis and hydrolytic constant – and its relation with pH and pOH – Buffer solution – pH of Buffer solution – Henderson’s equation – Buffer capacity – Application of buffer – Preparation of a buffer(one example)-Acid – base indicators –Theory of acid – base indicators.

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### UNIT 3 Electromotive Force (23 hrs)

Electrochemical cell-Daniell cell – Reversible and Irreversible cell – Single electrode potential – EMF of cells – Standard potential and standard emf – Standard Hydrogen electrode and calomel electrode – Types of electrodes – electrode reaction – cell reaction -Nernst equation for electrode potential and emf of the cell – Electrochemical series – IUPAC sign convention – Application of Gibb's Helmholtz equation to galvanic cells – Calculation of  $\Delta G$ ,  $\Delta H$ ,  $\Delta S$  and equilibrium constant from emf data – The standard cells – Weston Cadmium cell and its emf. Concentration cells – Electrode and electrolytic concentration cells with and without transference and their emfs – Liquid junction potential – Elimination of liquid junction potential – salt bridge – application of potential measurements – Determination of solubility product, ionic product of water, transport number . pH determination – Hydrogen, Quinhydrone electrode and glass electrode –advantages and dis advantages.potentiometric titration – redox indicators — Fuel cells. (hydrogen-oxygen, hydrocarbon-oxygen)

**Polarography** :Dropping Mercury Electrode, Polarization – Concentration polarization, Half wave Potential and Diffusion current (Significance), Ilkovic equation, Advantages of polarographic analysis – Applications.

### UNIT 4 Chemical Kinetics (16 hrs)

The rates of chemical reactions – Experimental techniques – rate laws and rate constant – Order and molecularity of reactions – Methods of determining the order of reaction – Integrated rate laws of zero order, first order and second order reactions — General integrated rate equation for nth order reaction - Zero and fractional order reactions - Half life –types of complex reactions-consecutive parallel and opposing reactions-their derivation ( first order only). Temperature dependence of reaction rates – Arrhenius equation – Interpretation of parameters – steady state approximation – Kinetics of unimolecular reactions –Lindemann's theory.Theories of reaction rates – collision theory – Derivation of rate equation for second order reaction from collision theory – thermodynamic approach of transition state theory – Entropy activation.Catalysis – Homogeneous and Heterogeneous catalysis – examples – Features of homogeneous catalysis – Enzymes – Michalis – menten mechanism. Heterogenous catalysis – Kinetics of unimolecular surface reactions– Langmuir isotherm– 2nd order surface reactions-Hinshelwood mechanism .

### UNIT 5 Photo Chemistry (7hrs)

Photochemistry – consequences of light absorption – The Jablonski diagrams – Radiative and non radiative transition – Light absorption by solutions – Lambert – Beer Law – Laws of photochemistry – The Grotthus – Draper law – Stark – Einstein law – Quantum efficiency / Quantum yield – Experimental determination of quantum yield – High and low quantum yield - Photochemical rate law – Energy transfer in photochemical reactions – Photo sensitization-application in photosynthesis(brief idea only) - quenching – Chemiluminescence – Lasers. Colorimetry - Instrumentation of photocolormeter -applications

### References

1. Physical Chemistry : P.W. Atkins, Oxford University Press.
2. Physical Chemistry : Puri, Sharma and Pathania, Vishal Publishing Co.
3. A Text book of Physical Chemistry: A S Negi and S C Anand, New Age International Publishers.

4. A Textbook of Physical chemistry: K. L. Kapoor, Volumes 1 &5, Macmillan India Ltd
5. Advanced Physical Chemistry: Gurdeep Raj, Goel Publishing House, Meerut.
6. Physical Chemistry: W.J. Moore, Orient Longmans.
7. Physical Chemistry: N. Kundu & S.K. Jain, S.Chand & Company.
8. Physical Chemistry : K. J. Laidler, John H.Meiser,
9. Chemical Kinetics : K.J.Laidler, Pearson Education.
10. Physical Chemistry : P C Rakshit
11. Electrochemistry: Samuel Glasstone

### **Distribution of Marks for External Examinations**

#### **Marks including choice:**

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 14    | V    | 6     |
| II   | 8     |      |       |
| III  | 20    |      |       |
| IV   | 14    |      |       |

Table 8. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

**CORE COURSE XVI: PHYSICAL METHODS IN CHEMISTRY**

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| VI       | 6B16CHE/PCH | 3                 | 3      | 3           |

**Course outcome**

On successful completion of this course, students should be able to

CO 1 i) Explain the important principles of spectroscopy

ii) Apply spectroscopic techniques in analyzing the structure of simple organic molecules

CO 2 Acquainting the working principles of various instruments and their functions

CO 3 Understand the basic principles of symmetry and group theory and its applications in chemistry

CO 4 Study the basic principles of nanochemistry and understand the various nanofabrication methods

CO 5 Explain the important principles for quantum chemical and molecular mechanic methods

of computing the geometry and energy of molecules

**Contact hours-54****UNIT 1 Spectroscopy I (18 Hours)**

Introduction: electromagnetic radiation, regions of the spectrum, interaction of electromagnetic radiation with molecules, Born-Oppenheimer approximation.

**Microwave Spectroscopy** – Rotation spectra-Instrumentation- Moment of inertia, Rotational Quantum numbers, Rotational Constant, Intensities of rotational spectral lines, Rotational – Vibrational Spectrum of diatomic molecules – Selection rules for rotational spectra.

**Infrared Spectroscopy** –Theory of infrared spectra-Degree of freedom in poly atomic molecules, Selection rule, Molecular vibration – Stretching and Bending modes, Calculation of stretching frequencies – fundamental Bands and Overtones, hot bands and Fermi resonance. Factors influencing vibrational frequency – Electronic effects, hydrogen bonding, solvent effect . Applications of IR Spectroscopy .

**Raman Spectroscopy** –block diagram, quantum theory of Raman scattering- Stokes and antistokes lines-selection rule, rule of mutual exclusion

**UNIT 2 SPECTROSCOPY II (18 Hrs)**

**UV Spectroscopy** – Franck condon principle-intensity of spectral lines -Absorption laws, Selection Rules – Types, Electronic transitions – Position and Intensity of absorption, Molar extinction coefficient, Chromophore – Auxochrome Concept, Absorption and Intensity Shifts, Types of Absorption Bands, Interpretations of spectra of simple conjugated dienes and enons, Woodward-Fieser Rule, Application to dienes and enons.

**NMR Spectroscopy** — Introduction, Theory of NMR, Phenomena of resonance, Modes of nuclear spin-Relaxation Process, Chemical Shift – Internal standard,  $\delta$  and  $\tau$  scale, Shielding Effects, Factors affecting Chemical Shift, Spin-Spin interaction, Interpretations of spectra of ethylbromide, ethanol, acetaldehyde, acetone, toluene and acetophenone.

**Mass Spectrometry** – Basic principles, Fragmentation pathway, Molecular ion peak, base peak, Meta stable ion, General rules for predicting the prominent peaks, Mc Lafferty Rearrangement, mass spectra of simple alkanes, cyclo alkanes, saturated alcohols and aliphatic ketones.

#### **UNIT 4 Molecular Symmetry and Group Theory (6 hrs)**

Symmetry of molecules-symmetry elements and symmetry operations – centre of symmetry, plane of symmetry, Identity – proper axis of rotation, improper axis of rotation – Schonflies notation – Point groups of simple molecules –  $C_{nv}$ ,  $C_{nh}$ ,  $H_2O$ ,  $NH_3$ ,  $N_2O_4$ ,  $N_2F_2$ .

#### **UNIT 5 Concepts and Applications of Nano Science (7 hours)**

Introduction - Nanomaterials – Classification based on dimensions, Synthesis – Top down and Bottom up-chemical precipitation, mechano-chemical method, micro emulsion method, reduction technique, chemical vapour deposition and solgel method, Hydrothermal synthesis(brief study)- Important methods for the characterization of nanomaterials – Scanning electron microscopy (SEM), transmission electron microscopy (TEM). Synthesis and applications of Quantum dots, Carbon nanotubes and Graphene (brief study).

#### **UNIT 6 Introduction to Computational chemistry (5 hrs)**

Molecular mechanics and force fields, Electron structure theory methods, Ab-initio methods and Basis Sets, Hartree-Fock Theory, Semiempirical Methods, Electron Correlations, Density Functional Theory, Gaussian input file format, Z-matrix

#### **References**

1. Physical Chemistry – A molecular Approach: Mc Quarrie, J. D. Simon, Viva Books Pvt Ltd.
2. Fundamentals of molecular spectroscopy: C. N. Baanwell and E M Mc Cash, TataMc GrawHill
3. A Textbook of Physical chemistry: K. L. Kapoor, Volume 4, Macmillan India Ltd.
4. Physical Chemistry, I. N. Levine, Tata Mc Graw Hill.
5. Elements of Physical chemistry: Puri, Sharma and Pathania, Vishal Publishing Co.
6. Physical Chemistry, K. J. Laidler, John H.Meiser.
7. Physical Chemistry : P.W. Atkins, Oxford University Press.
8. Electronic absorption spectroscopy and related techniques: D. N. Satyanarayana, Universities Press.
9. Nanosciece and nanotechnology: V. S. Muraleedharan and A. Subramania, Ane Books Pvt. Ltd.
10. Nano; The Essentials: T. Pradeep, Mc Graw-Hill education.
- 11 Symmetry and spectroscopy of molecules: K.Veera Reddy, New Age.International(P) Ltd
12. A. Szabo and N. S. Ostlund, Modern Quantum Chemistry, Introduction to Advanced Electronic Structure Theory, 1st ed., revised (Dover, 1989). More mathematical detail for many of the ab initio electronic structure methods.
13. D. A. McQuarrie, Quantum Chemistry (University Science Books, Mill Valley, CA, 1983). Very readable introductory text for undergraduate-level quantum chemistry.
14. I. N. Levine, Quantum Chemistry, 4th ed. (Prentice Hall, Englewood Cliffs, NJ, 1991). Covers some of the topics in this course.

15. Errol Leuwards-computational chemistry-Introduction to theory and applications of molecular and quantum mechanics.

### Distribution of Marks for External Examinations

#### Marks including choice:

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 20    | V    | 6     |
| II   | 20    |      |       |
| III  | 7     |      |       |
| IV   | 9     |      |       |

Table 8. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

**CORE COURSE VII: ENVIRONMENTAL CHEMISTRY****(DISCIPLINE SPECIFIC ELECTIVE COURSE)**

| <b>SEMESTER</b> | <b>COURSE CODE</b>    | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|-----------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B17CHE/PCH- A</b> | <b>3</b>                  | <b>3</b>      | <b>3</b>            |

**Course Outcome**

**On successful completion of this course, students should be able to**

CO1 Know the importance of environmental studies and methods of conservation of natural resources.

CO2 Describe the structure and function of an ecosystem and explain the values and Conservation of bio-diversity.

CO3 Explain the sources, environmental effects and control measures of various types of pollutions.

CO 4: Identify the toxic chemicals in environment and understand the sources, effects and treatment of heavy metal poisoning

CO5: Understand the methods of domestic water treatment, Sewage analysis and Sewage treatment

**Contact hours 54**

**Unit I . Environmental segments (6 hours)**

Environmental segments: Lithosphere, Hydrosphere, Atmosphere and Biosphere.

Atmospheric structure and composition - chemical composition of water in water bodies – (Ground water, river water and lake water, sea water wetlands)- Hydrological cycle.

Chemical Toxicology – Toxic chemicals in environment – Sources, effects and treatment of heavy metal poisoning – Pb, As, Cd, Hg, Cr, Cu & Co. Minamata and Itai-Itai diseases.

**Unit II. Air Pollution (14 hours)**

Pollutant-classification

Air pollution – Air pollutants –CO, NO<sub>x</sub>, SO<sub>2</sub>, H<sub>2</sub>S, Hydrocarbons, particulate matter.

Acid rain and its effects.

Green house effect and global warming – climate change – ozone chemistry and ozone

[Type text]

hole- chlorofluorocarbons, dioxins. Photochemical smog (reactions) – El Nino phenomenon. Bhopal gas tragedy. Control of air pollution – control by devices – Stacks, filters, electrostatic precipitators, cyclone separators, scrubbers and catalytic converters.

**Unit III. Water pollution (12 hours)**

Water resources, - water pollution – sources – Industrial effluents – agriculture discharge- oil spills – heavy metals – pesticides – detergents

Eutrophication – biomagnifications and bioaccumulation – experimental determination of

Dissolved oxygen, BOD and COD – Thermal Pollution – Control of water

pollution – ISI/BSI standards of drinking water. Hardness of water – causes and effects –

methods of estimation – removal of hardness. Domestic water treatment – Sewage –

Sewage analysis -Sewage treatment

**Unit IV. Soil Pollution (11 hours)**

Lithosphere – soil formation-Different types of weathering – components of soils – Acid

Base and ion exchange reactions in soil – soil pollution – soil acidification – effects on plants – liming of soil – Industrial and urban wastes – plastics, pesticides and heavy metals in soil – garbage – biomedical waste – E waste –Municipal Solid waste management. Bioremediation

**Unit V. Noise and Radiation pollution (11 hours)**

Noise pollution and Radioactive Pollution : Human acoustics - Noise – general features - types of Noise – Measurement of noise – sound pressure and power levels – sources and effects of noise pollution – prevention of hearing loss in industry – control of noise pollution.

Radiation chemistry – Man made and natural radiations – biological effects of radiation - radiation hazards from reactors – Fukushima nuclear disaster- radioactive waste management

References:-

1. Environmental Chemistry, A.K.De.
2. Environmental Chemistry, P.S. Sindhu
3. Environmental Chemistry, B. K. Sharma
4. Essentials of environmental studies, S.P. Misra & S.N.Pandey
5. Advanced Inorganic Chemistry Vol. II , Gurdeep Raj
6. Engineering Chemistry , Dr. B.K. Sharma
7. Engineering Chemistry, Jain & Jain, Dhanpat Rai Publishing Company

[Type text]



8. A Basic course in environmental studies, Surinder Deswal & Anupama Deswal.

### Distribution of Marks for External Examinations

#### Marks including choice:

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 6     | V    | 12    |
| II   | 16    |      |       |
| III  | 14    |      |       |
| IV   | 14    |      |       |

Table 8. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

**CORE COURSE XVII:APPLIED CHEMISTRY**  
**(DISCIPLINE SPECIFIC ELECTIVE COURSE)**

| <b>SEMESTER</b> | <b>COURSE CODE</b>    | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|-----------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B17CHE/PCH- B</b> | <b>3</b>                  | <b>3</b>      | <b>3</b>            |

**Course Outcomes :**

**On successful completion of this course, students should be able to**

CO-1 Explain the origin of coal, coal products ,petroleum products and their applications.

CO-2 Explain the manufacture of fertilizers , pesticides and their applications

CO-3 Understand the manufacture of glasses, cement ,ceramics and the formulations of paints and varnishes

CO-4 Familiarize with the chemistry of fats and oils and explain the production of soaps and detergents.

CO-5 Understand the chemistry of food additives and explain the manufacture and refining of pulp.

CO-6 Understand importance of industrial safety and industrial pollution control.

**Hours:54**

**UNIT 1: Fuel chemistry (10 hrs)**

**Coal:** Origin of coal, carbonization of coal, coal gas, producer gas, water gas, coal based chemicals.

**Petroleum and Petrochemical Industry:** Composition of crude petroleum, Refining and different types of petroleum products and their applications. Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels.

**Petrochemicals:** Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives.

**UNIT 2: Agrochemistry (9 hrs)**

**Fertilizers:** Classification of fertilizers, Manufacture of ammonium salts like ammonium nitrate, ammonium sulphate and urea. Action of Ammonium sulphate and urea as fertilizers. N.P.K. Fertilizers and Natural organic fertilizers.

**Pesticides:** Production and applications and residual toxicity of organochlorine pesticides (DDT, Aldrin), organophosphates (parathion, malathion), Carbamate (carbofuran). Bio-pesticides

### UNIT 3: Silicate Industry (8hrs)

**Glasses:** Classification and manufacture of glasses, Annealing of glass. Fiber glass, coloured glass, and optical glass

**Cement:** Portland cement - types, manufacture, composition and setting of cement.

White cement and water proof cement.

**Ceramic:** Subdivisions- raw materials - manufacturing-applications.

**UNIT 4: Paints, Lubricants, Adhesives and Pigments (10 hrs)**  
**Paints:** Classification, primary constituents and manufacturing of a paint. Emulsion paint - constituents and advantages. Latex paints and fire retardant paints. Solvents and thinners.

**Lubricants:** Properties and classification, additives for lubricating oil, lubricants of mineral origin, lubricating grease and solid lubricants.

**Adhesives:** The Process of bonding. Classification and preparation of adhesives, synthetic resin adhesives, and rubber based adhesives, uses of adhesives.

**Pigments:** Characteristics and uses of titanium dioxide, ultra marine blue and red lead

### UNIT 5: Food Chemistry (8 hrs)

**Food additives:** Food flavour, food colour, food preservatives, artificial sweeteners, edible emulsifiers and edible foaming agents- uses and abuses of these substances in food and beverages

**Fermentation Chemicals:** Production, and purification of ethyl alcohol, citric acid, lactic acid, Vitamin B12, Penicillin.

### UNIT 6: Chemical Explosives. Industrial safety and pollution prevention (9 hrs)

**Chemical explosives:** Characteristic of explosives, preparation and explosive properties of Trinitro toluene, Lead azide, Nitroglycerine, RDX.

**Industrial safety:** OSHA-Hazard analysis and risk assessment-types of hazards in industries\_risk management plan.

**Industrial pollution prevention:** Definition of industrial waste-types of industrial waste-Industrial pollution prevention-Recycling-waste treatment.

### REFERENCES

1. B. K. Sharma: *Engineering Chemistry*, Goel Publishing House, Meerut
2. *Industrial chemistry* by B.K Sharma.
3. *Industrial chemistry* B.N Chakrabarthy

[Type text]

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5. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: *Introduction to Ceramics*, Wiley Publishers, New Delhi
6. J. A. Kent: Riegel's *Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.
7. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry*, Vikas Publications, New Delhi.
8. P. C. Jain, M. Jain: *Engineering Chemistry*, Dhanpat Rai & Sons, Delhi
9. Carey, D.E. Casida *Industrial Microbiology*.
10. *Mechanism and theory in food chemistry*, Dominic W.S.Wong
11. *Food Science* , R. Sreelakshmi
12. Mohammad Farhat Ali, Bassam M. El Ali,, James G Speight, *Hand book of Industrial chemistry: Organic Chemicals*, Publisher: Mc-graw Hill Education

#### Distribution of Marks for External Examinations

##### Marks including choice:

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 12    | V    | 8     |
| II   | 12    | VI   | 10    |
| III  | 10    |      |       |
| IV   | 10    |      |       |

Table 8. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

**CORE COURSE XVII: POLYMER CHEMISTRY**  
**(DISCIPLINE SPECIFIC ELECTIVE COURSE)**

| <b>SEMESTER</b> | <b>COURSE CODE</b>    | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|-----------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B17CHE/PCH- C</b> | <b>3</b>                  | <b>3</b>      | <b>3</b>            |

**Course Outcome**

**On successful completion of this course, students should be able to**

CO 1) Classify polymers and explain the configuration of polymers and properties like glass transition temperature and melting point of polymers

CO2) Illustrate the preparation, properties and applications of polymers

CO3) Interpret the mechanism of polymerization

CO4) Acquaint various polymer processing technologies and explain thermal methods of analysis of polymers

CO5) Know the recent advances in polymer chemistry

**Contact Hrs : 54**

**1. Introduction. (16 hours)**

Definition of monomer, polymer and polymerization – Classification of polymers - natural, semisynthetic and synthetic - condensation & addition polymers - Linear, branched and crosslinked polymers - Homo polymers and copolymers – Graft and block copolymers, composites, blends, elastomers, fibres, plastics, thermoplastic and thermosetting polymers. Tacticity in polymers-Isotactic, syndiotactic and atactic polymers. Properties of polymers : Glass transition temperature (T<sub>g</sub>) - Definition- Factors affecting T<sub>g</sub> - relationships between T<sub>g</sub> and molecular weight and melting point. Importance of T<sub>g</sub>.

**2. Plastics, rubbers and fibres. (14 hours)**

Preparation, properties and applications of - Plastics: Polyethylene, Polyvinylchloride, polymethyl methacrylate, polyethylene terephthalate, Teflon, Bakelite. Rubbers: natural and synthetic rubbers – polybutadiene, polyisobutylene, butyl rubber, nitrile rubber, BUNA-S, BUNA N, neoprene rubber. Synthetic fibres : Nylon 66, Nylon 6, Rayon.

**3. Polymerisation Techniques (14 hours)**

Types of polymerization- addition (initiation, propagation and termination), condensation, ionic (cationic & anionic), Ring opening polymerizations (epoxy resins) coordination polymerization –

[Type text]

Ziegler Natta catalyst - moulding of plastics into articles- compression moulding - injection moulding - blow moulding - extrusion moulding – Calendering – Spinning.

#### 4. Advances in Polymers (10 hours)

Biopolymers - biodegradable polymers - Polymers in medical field - High temperature and fireresistant polymers - Conducting polymers PAC, PPP, PPY etc - Polymers used as adhesive and coatings, liquid crystalline polymers, Vulcanization of rubber. Environmental Hazards of plastics and recycling

#### References:

1. V.R. Gowariker, N.V. Viswanathan and Sreedhar, *Polymer Science*, Wiley Easern Ltd.
2. F.W. Billmeyer, *A text book of polymer science*, John Wiley & Sons, 1971.
3. Maurice Morten, *Rubber Technology*, Van Nostrand, Reinold, New York.
4. S. Paul, *Surface Coatings*.
5. B.K. Sharma, *Polymer Chemistry*, Goel Publishing House, Meerut.
6. M. Jenkins, *Biomedical Polymers*, University Birmingham, U.K.
7. M.G. Arora, M. Singh and M.S. Yadav, *Polymer Chemistry*, 2nd Revised edition, Anmol Publications Private Ltd.

#### Distribution of Marks for External Examinations

#### Marks including choice:

| Unit | Marks |
|------|-------|
| I    | 17    |
| II   | 15    |
| III  | 16    |
| IV   | 14    |

Table 8. Type of questions & Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

**CORE COURSE XVII: NANOCHEMISTRY  
(DISCIPLINE SPECIFIC ELECTIVE COURSE)**

| SEMESTER | COURSE CODE     | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-----------------|-------------------|--------|-------------|
| VI       | 6B17CHE/PCH - D | 3                 | 3      | 3           |

**Course Outcomes**

On successful completion of this course, students should be able to

CO 1: Understand the basic concepts and classification of nanomaterials.

CO 2: Analyze different nano systems and their properties.

CO 3 :Understand the various techniques adopted for the synthesis and characterization of nanomaterials.

CO4 : Characterize the nanomaterials using various microscopic techniques.

CO 5: Understand the application of nanomaterials in various fields including catalysis, photonics, and medicine

**Contact hours: 54 Hrs**

**Unit I Introduction to Nanomaterials**

**(10 hrs)**

Nanotechnology- Definition, Historical milestone. Feynmans hypothesis, Surface area to volume ratio, Quantum confinement, Classification of Nanomaterials based on dimesnsions (0D, 1D, 2D, 3D). Different types of nano systems (synthesis and properties)- Carbon nano systems- fullerenes, graphenes, carbon nanotubes; Inorganic nano particles-TiO<sub>2</sub>, ZnO; Organic nano systems- dendrimers, Metal nano particles-quantum dots.

**UnitII Nanosynthesis**

**(16 hrs)**

Various methods for the synthesis of nanoparticles: Top-down and Bottom-up approaches. Physical methods-Ball Milling, Melt mixing techniques, Physical vapour deposition, Chemical vapour deposition (CVD).Chemical methods-Chemical precipitation, Sol gel Method, Hydrothermal and Solvothermal synthesis, Microemulsion or Reverse micelle synthesis. Microwave synthesis, Electrochemical method. Biological synthesis using plant extract and micro organism.Molecular self assembly.

**Unit III. Nanomaterial Characterisation****(16 hrs)**

Important methods for the characterization of nanomaterials –Principles and Applications only- Scanning electron microscopy (SEM), Transmission electron microscopy (TEM), Scanning tunneling electron microscopy (STEM), Scanning probe microscopies (SPM)-Scanning tunneling microscopy (STM), Atomic force microscopy (AFM), Photoelectron spectroscopy (UPES and XPES), X-ray diffractometer (XRD). UV-visible and Raman Spectroscopy.

**Unit IV Applications of Nanomaterials****(12 hrs)**

Nanomaterials for environmental Remediation- Photocatalysis, Water purification using nanomaterials, desalination of water, Heavy metal and oil spill removal. Solar energy conversion (Dye sensitized solar cells) and storage (Supercapacitors). Nanocatalyst. Biological applications- Imaging, labeling, targeted drug delivery. Nanomaterials in electronics and spintronics, Nanosensors. Applications in Self cleaning surfaces, sports equipments, and cosmetics.

**References:**

1. T. Pradeep, Nano: The Essentials, Mc Graw Hill Publishing Company, New Delhi (2007).
2. C. N. R. Rao and A. Govindraj, Nanotubes and Nanowires, Royal Society of Chemistry (2005).
3. V. S. Muraleedharan and A. Subramania, Nanoscience and nanotechnology, Ane Books Pvt. Ltd. New Delhi, 2009.
4. Dr. Ashuthosh Sharma, Dr. Bellari, Advances in Nanoscience and Nanotechnology- -CSIR Publication 2004
5. G. A. Ozin et al, Nanochemistry: A Chemical Approach to Nanomaterials – Royal Society of Chemistry, Cambridge, UK 2005.
6. R. Booker and E. Boysen, Nanotechnology, Wiley India Pvt Ltd, 2008.
7. K. J. Klabunde, Nanoscale materials in chemistry, John Wiley and Sons.
8. S.M. Lindsay, Introduction to Nanoscience, Oxford University Press.
9. K.K. Chattopadhyay and A. N. Banerjee, Introduction to nanoscience and Technology, PHI learning pvt. Ltd. Delhi.
10. Sulabha K. Kulkarni, Nanotechnology Principles and Practices, Capital Publishing Company, Kolkatta.
11. <http://www.zyvex.com/nanotech/feynman.html>
12. <https://www.azonano.com/>



**Distribution of Marks for External Examinations****Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 12    |
| II   | 18    |
| III  | 17    |
| IV   | 15    |

Table 8. Type of questions &amp; Marks for External Examination - Core Chemistry

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 4               | 4                               | 1                      | 4           |
| Short answer         | 10              | 7                               | 2                      | 14          |
| Short essay/Problems | 6               | 4                               | 3                      | 12          |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 24              | 17                              |                        | 40          |

**SYLLABUS OF BSc CHEMISTRY PRACTICAL  
SEMESTER I & II**

**CORE COURSE PRACTICAL I (1B02CHE/PCH & 2B02CHE/PCH)  
Volumetric Analysis**

**72 hrs/ credit 3**

**Course Outcome**

**On successful completion of this course, students should be able to**

CO 1) Apply the theoretical concepts while performing experiments.

CO2 ) Acquire practical skill to estimate acid, base, oxidizing agents etc by volumetric titration method

CO3) Estimate the metallic ions by complexometric titration method

CO4) Acknowledge experimental errors and their possible sources.

CO5) Able to prepare inorganic complexes

CO 6) Design, carry out, record and analyze the results of chemical experiments

**Introduction to Volumetric analysis**

Equivalent and molecular mass of compounds. Normality and Molarity -Primary

standards. Preparation of standard solution - Principles of volumetric analysis. For acidimetry, alkalimetry and permanganometry two burette method may be used and for other volumetric analyses conventional methods can be used.

1 Acidimetry And Alkalimetry

a) Estimation of NaOH/KOH using standard  $\text{Na}_2\text{CO}_3$ .

b) Estimation of HCl/ $\text{H}_2\text{SO}_4$ / $\text{HNO}_3$  using standard oxalic acid.

2 Permanganometry

a. Estimation of oxalic acid.

b. Estimation of  $\text{Fe}^{2+}$

c. Estimation of Nitrite.

3 Dichrometry

a. Estimation of  $\text{Fe}^{2+}$  -using internal and external indicator

b. Estimation of  $\text{Fe}^{3+}$  - reduction by  $\text{SnCl}_2$  - internal indicator

4 Iodometry And Iodimetry

[Type text]

- a. Estimation of  $\text{Cu}^{2+}$  /  $\text{CuSO}_4 \cdot \text{SH}_2\text{O}$ .
  - b. Estimation of potassium dichromate.
  - c. Estimation of  $\text{As}_2\text{O}_3/\text{As}^{3+}$
- 5      Precipitation titration-using adsorption indicators

Estimation of chloride in neutral medium

6      Complexometry

Estimation of  $\text{Mg}^{2+}$ ,  $\text{Zn}^{2+}$  and hardness of water

Inorganic Preparation

- a. Ferrous ammonium sulphate.
- b. Potash alum.
- c. Tetraammine copper(II) sulphate.
- d. Potassium trisoxalato chromate.

Prepare any one sample in the examination and exhibit the product.

**SEMESTER III& IV****(3B05CHE/PCH& 4B05CHE/PCH) Inorganic Qualitative Analysis**

Credit 3

72hrs

**Course Outcome**

**On successful completion of this course, students should be able to**

CO 1) Apply the theoretical concepts while performing experiments.

CO2) Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts

CO 3) Able to design, carry out, record and analyze the results of chemical experiments

CO 4) Learns the effective usage of chemicals

- 1 Systematic qualitative analysis of mixtures containing two anions by semi micro method. Study of the reactions of the following anions with a view to their identification, confirmation and procedure for elimination - carbonate, acetate, oxalate, fluoride, bromide, iodide, nitrate, sulphate, borate, phosphate, chromate, arsenate, arsenite. One of the anion should be eliminating radical.
- 2 Systematic qualitative analysis of mixture containing two cations by semimicro method. The cation mixtures may given as solution.

Study of the reaction of the following ions with a view to their identification and confirmation.

Lead, bismuth, copper, tin, iron, aluminum, zinc, manganese, cobalt, nickel, barium, strontium, calcium, magnesium,  $\text{NH}_4^+$

Note : minimum ten mixtures should be analyzed and recorded.

**SEMESTER V & VI****5B11 CHE /PCH & 6B11 CHE/PCH : GRAVIMETRIC ANALYSIS**

Credit:3

**Course Outcome****On successful completion of this course, students should be able to**

CO1: Make use of standardised procedures for the Gravimetric analysis

CO2: learn the skills of Precipitation process, digestion, filtration, incineration etc.

CO3: Acquire practical Knowledge of co-precipitation

CO4: Handle sintered glass vessels

CO5) Acknowledge experimental errors and their possible sources.

CO6) Able to design, carry out, record and analyze the results of chemical experiments

Introduction to gravimetric techniques and its highlights.

1. Determination of water of hydration in crystalline barium Chloride.
2. Determination of barium as barium sulphate.
3. Determination of sulphate as barium sulphate.
4. Determination of iron as ferric oxide.
5. Determination of calcium as calcium carbonate.
6. Estimation of nickel as nickel dimethylglyoxime.
7. Determination of copper as cuprous thiocyanate.
8. Determination of magnesium as magnesium oxinate.

## SEMESTER V &amp; VI

## 5B12 CHE/PCH&amp; 6B12 CHE/PCH : ORGANIC CHEMISTRY

Credit:3

**Course Outcome**

**On successful completion of this course, students should be able to**

CO 1) Apply the theoretical concepts while performing experiments.

CO2) Acquire practical skill in qualitative analysis of organic compounds

CO 3) Acquire practical skill in preparing organic compounds and in their purification by crystallisation

CO4) Separate organic compounds in a mixture –by steam distillation, TLC and Column Chromatography

CO5) Acquire the habit of working safely with the chemicals and handling of equipments

1. Synthesis of Organic Compounds.

a. Aromatic electrophilic substitution:

Nitration

Preparation of dinitrobenzene from nitrobenzene. Preparation of *p*-nitroacetanilide

Halogenation -

Preparation of *p*-bromoacetanilide.

preparation of 2, 4, 6 - tribromophenol.

b. Diazotization and coupling :

Preparation of phenyl azo  $\beta$ -naphthol. Preparation of methyl orange.

c. Oxidation :

Preparation of benzoic acid from benzyl chloride or benzaldehyde

d. Esterification :

Benzoylation of phenol/aniline to phenyl benzoate.

e. Hydrolysis : Benzamide or ethylbenzoate to benzoic acid.

[Type text]

## 2. Organic Qualitative Analysis

a. Qualitative analyses with a view to characterize functional group/groups in the following compounds:

Naphthalene, anthracene, chlorobenzene, bromobenzene, benzyl chloride, *p*-dichlorobenzene, benzyl alcohol, phenol, cresols, naphthols, resorcinol, benzaldehyde, acetophenone, benzophenone, benzoic acid, phthalic acid, cinnamic acid, succinic acid, salicylic acid, ethyl benzoate, methyl salicylate, benzamide, urea, aniline, toluidines, dimethyl aniline, nitrobenzene, *o*-nitrotoluene, glucose, sucrose.

b. Preparation of derivatives.

*Note : Minimum ten compounds should be analyzed and recorded. For analysis, reactions may be carried out in tiles, wherever possible.*

## 3. Thin layer Chromatography and Column Chromatography

a. Preparation of the TLC plates - Checking the purity of the compounds by TLC - Acetylation of salicylic acid, aniline, Benzoylation of aniline and phenol, Determination of R<sub>f</sub> Values and identification of organic compounds by TLC, preparation and separation of 2, 4-dinitrophenyl hydrazones of acetone and 2-butanone using toluene and light petroleum (40 :60).

b. Separation of ortho and para nitroaniline mixture by column chromatography.

4. Demonstration Experiments Steam distillation : Separation of ortho and para nitro phenols.

## SEMESTER VI

## 6B18CHE/PCH `PHYSICAL CHEMISTRY

CREDIT: 3

Hrs/week: 3

**Course Outcome**

**On successful completion of this course, students should be able to**

CO 1) Acquire practical skill in physical chemistry experiments such as Cryoscopy, Transition Experiments, Phase Rule Experiments, Conductometric titrations, Potentiometric titrations, colorimetry and Chemical Kinetics

CO2) Learn statistical approach for evaluating data

CO3) Able to carry out and record these experiments in a skilful manner

CO4) Acquire the habit of working safely with the chemicals and handling of equipments

1: Cryoscopy Using Solid Solvent

a) Cryoscopic constant of solid solvent using a solute of known molar mass (cooling curve method)

Solid solvents/solutes given: Naphthalene, Biphenyl, diphenyl amine.

b) Molar mass of the given solute, using solvent of known  $K_f$ .

Solid solvents/solutes given: Naphthalene, Biphenyl, diphenyl amine.

2: Transition Experiments (cooling curve method)

a) Transition point, depression constant (KT) of the given Salt hydrate, using solute of known molar mass.

salthydrates:  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$  /  $\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$ . Solutes : Urea, Glucose,

b) Molar mass determination of given solute using salt hydrates of known

(KT) Salt hydrates and solutes as above

3: Phase Rule Experiments

Critical Solution Temperature (C.S.T)

a) Critical solution temperature of phenol - water system

b) Concentration (% composition) of NaCl/KCl by C.S.T Measurements

4. Conductometry

Conductometric titrations

[Type text]



a) Strong acid x strong base

b) Weak acid x strong base

5 : Potentiometry

Potentiometric titrations

a) Acid base titration (Strong acid, strong base)

6 : Distribution Law

Partition coefficient of  $I_2$  between  $CCl_4$  and  $H_2O$

7. colorimetry

Verification of Beer-Lambert law for  $KMnO_4$ , determination of the concentration of the given solution.

8. Chemical Kinetics - Hydrolysis of methyl acetate using  $HCl$  acid.

9. Surface tension –Measurement using Stalagmo meter

Note:

1. A minimum number of 8 experiment should be done

2. Electronic balance may be used for practical work.

VIVA VOCE

Viva voce examination based on practical will be conducted along with every practical examination.

REFERENCES

1. A.I.Vogel - A Text Book of Qualitative Analysis including semi-micro methods
2. V.V.Ramanujan - Semi micro Qualitative Analysis.
3. A.I.Vogel - A Text Book of Quantitative Inorganic Analysis.
4. A.I.Vogel - Elementary Practical Organic Chemistry.
5. A.O.Thomas - Practical Chemistry for B.Sc Chemistry.
6. A Findlay - Practical Physical Chemistry.
7. R.C.Das & E Behara - Experimental Physical Chemistry.
8. N.K.Vishnoi - Advanced Practical Chemistry.
9. Y.B. Yadav, Practical Physical Chemistry.

## STUDY TOUR

Students are required to visit at least one Laboratory/factory/Research Institute of eminence during the course and submit the Study tour report separately along with practical records at the time of practical Exam (6<sup>th</sup> Semester).

## PROJECT REPORT:

**PROJECT** CO 1) Able to enhance the skills of managing the resources, time and team work.

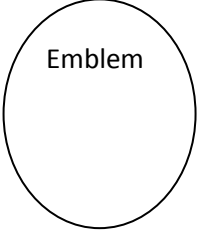
2) Students will be able to function as a member of an interdisciplinary problem solving team.

Students should undertake a group project work related to chemistry and submit the report along with practical records during VI semester practical.

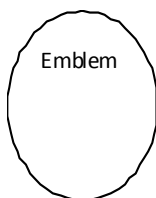
### General Guidelines of Project Work

1. Students should undertake the project work related to Chemistry only.
2. The UG level project work is a group activity, maximum number of students being limited to five. However each student should prepare and submit the project report separate
3. The matter should be typed on A-4 size paper with Times New Roman font of size 12 points, with double spacing between the lines and margins of 1.5' at the left, 1' at the right, 1' each at the top and bottom.
4. The report should be printed in plain white paper in black ink only. Color inks for charts and graphs can be used, provided it does not hamper the readability. The logo of the college can be displayed in the report.
5. The project report should be hard bound/ spiral bound / paper back.

**Format of the Project Report**

|                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Title</b></p> <p style="text-align: center;"></p> <p style="text-align: center;"><b>Name of the student</b></p> <p style="text-align: center;"><b>Department</b></p> <p style="text-align: center;"><b>College</b></p> <p style="text-align: center;"><b>Month &amp; Year</b></p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Title**



**Project report submitted to Kannur University in partial fulfillment for the BSc degree (Chemistry)**

**By**

**Name of Student**

**Reg No**

**Name & Designation of project guide**

**Signature, Name & Designation of Head of the department**

**Examiners:**

**1)**

**2)**

Page I : Certificate (By Project Guide)

Page 2. Declaration (By Student)

Page 3. Acknowledgement

Page 4 . Contents

[Type text]

Chapter I : Introduction

Chapter II : Aim of the project/Problem Statement

Chapter III : Review

Chapter IV : The Study/Present work

Chapter V : Data Analysis/ Discussion

Chapter VI :Conclusion

Bibliography

**MODEL QUESTION PAPERS FOR PRACTICALS****B.Sc CHEMISTRY PRACTICAL EXAMINATION  
SEMESTER 11-****1B02CHE/PCH& 2B02CHE/PCH Volumetric Analysis**

Time : 3 Hours      Maximum marks:40

Credit : 3

Instruction : candidate should submit bonafide record at the time of examination

1. Write down the Principle for the estimation of .....given  
.....
2. Calculate the weight of ..... required for the preparation of  
.....N,.....ml solution.
3. Estimate the amount of ..... in the whole of the given solution provided with  
.....solution and .....crystals.
4. Exhibit the samples of inorganic complexes prepared
5. Viva Voce

**SEMESTER IV****PRACTICAL II :****3B05CHE/PCH& 4B05CHE /PCH INORGANIC QUALITATIVE ANALYSIS**

Time: 4Hours    Maximum Marks:40

Credit: 3

Instruction : candidate should submit bonafide record at the time of examination

1. Analyse systematically the given mixture containing the anions and  
cations by semi-micro method.
2. Viva Voce.

**SEMESTER VI      5B11CHE/PCH& 6B11CHE/PCH****PRACTICAL III : \*GRAVIMETRIC ANALYSIS**

Time : 3 Hours Maximum Marks:40

Credit: 3

- 1 Write a brief outline of the procedure for the gravimetric estimation of .....  
.....in the solution.....
- 2 Estimate gravimetrically the amount of .....in the whole of  
the given..... Solution.
- 3 Viva Voce

**SEMESTER VI      5B12CHE/PCH& 6B12CHE /PCH****PRACTICAL IV:\*ORGANICCHEMISTRY**

Time : 3 Hours Maximum Marks:40

Credit: 3

1. Write down the procedure for the preparation of.....from.....
2. Analyse systematically the given organic compound with a view to identify  
the functional group present in it and submit a report of the procedure adopted.  
Suggest a suitable solid derivative for the compound and write the procedure for  
its preparation..
3. Convert the given .....into.....Recrystallise  
and  
exhibit both crude and recrystallised samples.
4. Viva Voce.

\*Practical paper III & paper IV are to be conducted in the sixth semester for 6hrs on the second day.

**SEMESTER VI****PRACTICAL V: 6B18CHE/PCH PHYSICAL CHEMISTRY**

Time : 4 Hours

Credit : 3

Instruction : Candidate should submit bonafide record at the time of examination.

Attempt the question marked X

1. Determine the molecular mass of the given solute B by cryoscopic method.  $K_f$  of solid solvent A is ----- . Conduct a duplicate experiment.
2. Determine the rate constant for the hydrolysis of the given ester in the presence of the given acid. Calculate 5 k values. Obtain k value graphically.
3. Determine the Cryoscopic constant of the given solid solvent A using solute B of molecular mass----- . Conduct a duplicate experiment.
4. Determine the mass of HCl in the given solution conductometrically.
5. Write down the procedure for the experiment marked X within first 5 minutes. 6. Submit the Project Report & Report of Industrial visit.
7. VIVA VOCE



**GENERIC ELECTIVE COURSE**  
**CHEMISTRY IN SERVICE TO MAN**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D01CHE/PCH</b> | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**Contact hours:36Hrs**

**Course Outcome**

**On successful completion of this course, students should be able to**

CO1) i) Understand the classification, structure, function and applications of polymers

ii) Understand the importance of biodegradable polymers

CO2) Acquaint with different types of fertilizers and pesticides and understand the effect of fertilizers and pesticides on the environment

CO 3) Explain the classification of fuels and composition of petroleum and familiarise the fuel cells and batteries and Understand their applications in modern life

CO 4) Explain different types of glasses ,their applications and the composition of Portland cement

CO5) Identify the harmful chemicals present in cosmetics and understand their effects in human body

**Unit 1. PLASTICS & POLYMERS(10hrs)**

Polymers- Types of polymers natural & synthetic polymers-characteristics and examples.

General characteristics and applications of polymers such as Polythene (LDPE & HDPE), polypropylene, PVC, Poly styrene. Artificial fibers -examples

Plastics- Thermoplastics and thermosetting plastics- Characteristics and examples..

Elastomers Natural and synthetic rubbers-Vulcanization(mention only). Biodegradable polymers .examples.

benefits of biodegradable plastics. Importance of plastic recycling.

**Unit 2. FERTILIZERS & INSECTICIDES(7hrs)**

Natural , synthetic mixed and NPK fertilizers – examples. -Impact of excessive use of fertilizers on environment – Bio fertilizers –Pesticides and their classification- examples. Excessive use of pesticides.

[Type text]

Environmental hazards.Safe handling of pesticides. Insect repellants

### **Unit 3. FUELS, CELLS & BATTERIES(7hrs)**

Definition and classification of fuels – Characteristics of good fuel – Combustion - Calorific

value – wood- coal - petroleum-origin –different fractions, their composition & uses. Natural gas, Biogas & LPG – their composition and uses.

Pollution due to burning of fossil fuel -Batteries and fuel cells – Different types – Applications in modern life.

### **Unit 4 CEMENT & GLASS(6hrs)**

Cement- Classification – Portland cement – Raw materials – manufacture – setting and

hardening – Glass – Different types – manufacture – raw materials – manufacture of ordinary glass

### **5. COSMETICS(6hrs)**

Cosmetics – Cleansing cream, cold cream, bleaching & vanishing creams, perfumes, talcum powder, tooth paste, deodorants , lipstick –ingredients. Harmful chemicals in cosmetics

References:-

1. J Barrett: Chemistry in your environment-User friendly, Simplified Science.
2. Howard L White: Introduction to Industrial Chemistry
3. David M Targarden: Polymer Chemistry – Introduction to an indispensable science.
4. M.S.Yadav: Synthetic drugs
5. Samuel Delvin: Dyes and Pigments
6. Alexander Findlay: Chemistry in the service of man
7. S. K Honda: Principle of pesticide chemistry
8. M.M.Chakrabarthy: Chemistry and Technology of oils and fats
9. Shalini Sareen: Chemotherapeutic agents
10. P.K.Ray: Pollution and health
11. Vanessa Good ship: Introduction to plastic recycling
- 12.Randy Schmetter and Perry Romanoswski: Beginning cosmetic chemistry.
13. V Jain: Organic polymer chemistry
- 14.V K Selva raj: Advanced polymer chemistry

[Type text]

15. Jr Charles E Carraher: Introduction to polymer chemistry

16. Shashi Chawla: A Text Book of Engineering Chemistry

17. Jain & Jain : Engineering Chemistry

**Distribution of Marks for Generic Elective Course**

**Marks including choice:**

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 9     | V    | 5     |
| II   | 6     |      |       |
| III  | 5     |      |       |
| IV   | 5     |      |       |

Table 10. Type of Questions & Marks for External Examination – Generic Elective Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Marks for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|---------------------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                                     | 5           |
| Short answer         | 5               | 3                               | 2                                     | 6           |
| Short essay/Problems | 5               | 3                               | 3                                     | 9           |
| Total                | 15              | 11                              |                                       | 20          |

**GENERIC ELECTIVE COURSE****DRUGS - USE & ABUSE**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D02CHE/PCH</b> | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**Contact hours:36Hrs**

**Credit 2**

**Course Outcome**

**On successful completion of this course, students should be able to**

CO 1) Familiarise the classes of drugs and their examples

CO 2) Distinguish prescription drugs and over the counter drugs

CO 3) Understand the routes of administration of drugs and their importance

CO 4) Familiarise various synthetic drugs and their uses

CO 5) Understand the consequences of misuse of antibiotic

CO 6) Recognise the drugs of abuse and understand the consequences of drug abuse

**INTRODUCTION(5HRS)**

Drugs- Definitions, Classifications – Prescription drugs and Over the Counter drugs- examples of drugs- Routes of drug administrations, Enteral, parenteral and topical routes. Bioavailability of drugs -Advantage and disadvantage of various routes of administrations-

**PHARMACOKINETICS**

**(10HRS)**

Definition of Pharmacokinetics- A brief explanation of Absorption, Distribution- Metabolism (Biotransformation) and Excretion . First pass metabolism, Therapeutic index , Drug tolerance, Placebo , Adverse drug reactions .

**SYNTHETIC DRUGS (8HRS)**

Examples of Antipyretics , analgesics and anti inflammatory agents . A brief explanation of their mode of action .Antibiotics- Discovery and its importance. Examples of antibiotics - Antibiotic misuse .Anti histamines- examples , Antacids , anti- ulcer drugs . Drugs acting on Central Nervous System, Cardiovascular drugs classification and examples.

**MISCELLANEOUS DRUGS****(6 HRS)**

Antiseptics and disinfectants, Vaccines, Vitamins and Minerals, Enzymes and Hormones, Treatment in poisoning.

**DRUGS OF ABUSE:-****(7HRS)**

Classification of drugs of abuse -Narcotic analgesic CNS Stimulants examples and effects, Depressants, Hallucinogens examples and effects, Sedatives, hypnotics example and effects ,Opioids, Cannabis and Inhalants examples and effects . Drug dependence, withdrawal symptoms , tolerance and addiction.

## References

1. Drugs - G.L. David Kurupadanam, Vijayaprasad, KVaraphiipatrasad Rao et.al.
2. Medical Pharmacology- PadmajaUdayakumar
3. Essentials of Medicinal Pharmacology - Tripathi
4. Medicinal Chemistry - AshuthoshKar
5. Dispensing Pharmacy - Kapoor & Gunn
6. A Text Book of Forensic Pharmacy - B.M. Mithal.
7. A Text Book of Organic and Pharmaceutical Chemistry - Wilson & Gisvold

**Distribution of Marks for Generic Elective Course****Marks including choice:**

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 5     | V    | 5     |
| II   | 8     |      |       |
| III  | 8     |      |       |
| IV   | 4     |      |       |

Table 10. Type of Questions &amp; Marks for External Examination – Generic Elective Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Marks for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|---------------------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                                     | 5           |
| Short answer         | 5               | 3                               | 2                                     | 6           |
| Short essay/Problems | 5               | 3                               | 3                                     | 9           |
| Total                | 15              | 11                              |                                       | 20          |

**GENERIC ELECTIVE COURSE****Environmental Studies**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D03CHE/PCH</b> | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**Contact hours:36Hrs**

**Course Outcome**

**On successful completion of this course, students should be able to**

CO 1) Differentiate the environmental segments and understand the importance of environmental segments

CO 2) Identify the types of environmental pollution and the various sources of the pollution

CO 3) Understand the consequences of environmental pollutions

CO 4) Explain the measures of control of environmental pollution

CO 5) Recognise various sustainable energy sources

**UNIT1.** Environmental segments

6 Hours

Environmental segments – Lithosphere: soil formation – components of soils. Hydrosphere: Hydrological cycle- Biosphere - Atmosphere- Structure and composition

**UNIT 2.**Air Pollution

9 Hours

Types of pollutants

Air pollution –Sources – pollutants –CO, NO<sub>x</sub>, Sox, Hydrocarbons, Particulates. Effect on ecosystem., Ozone layer –importance, Ozone depletion-Control measures- Acid rain-

control of acid rain- Green house effect-global warming,-photochemical smog(Eqns not

needed)- effect pollution on plants and human beings. Control of air pollution Noise Pollution – physiological response to noise – biological effects- carbon foot print

**UNIT 3.**Water Pollution 7 Hours

Water Pollution – Sources –Industrial effluents- agriculture discharge - oil spills-

heavy metal -pesticides-biomagnifications and bioaccumulations

[Type text]

Dissolved oxygen in water, chemical oxygen demand (COD) and biochemical oxygen demand (BOD) (Definition only)- control of water pollution- ISI/BIS standards of drinking water

**UNIT 4. Soil Pollution** 8 Hours

Soil Pollution - Sources by industrial and urban wastes, radioactive pollutants, plastics

heavy metals. Poisoning by heavy metals – Minamata and Itai-Itai diseases.

Control of soil pollution.- Solid waste Management -Thermal pollution

definition-sources of thermal pollution, harmful effect of thermal pollution

prevention of thermal pollution.

**UNIT 5. Sustainable Energy Sources & Technology**

6 Hours

Green energy Sources- Wind-water-solar– use of solar energy in space-

Production of electricity using solar energy- Tidal, Biomass and geothermal energy

References:

1. Text book of Environmental Studies for under graduate courses – Erach Bhar

2. Essential Environmental studies- S. P. Misra – S. N. Pandey

3. Environmental chemistry and pollution control – S.S Dara (2<sup>nd</sup> Edition)

4. Environmental chemistry- Peter O' Neill

5. Environmental chemistry – B.K. Sharma

6. Fundamental concepts of environmental chemistry – G.S Sodhi

7. Environmental Chemistry. A.K De

### Distribution of Marks for Generic Elective Course

#### Marks including choice:

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 4     | V    | 4     |
| II   | 10    |      |       |
| III  | 7     |      |       |
| IV   | 5     |      |       |

Table 10. Type of Questions & Marks for External Examination – Generic Elective Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Marks for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|---------------------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                                     | 5           |
| Short answer         | 5               | 3                               | 2                                     | 6           |
| Short essay/Problems | 5               | 3                               | 3                                     | 9           |
| Total                | 15              | 11                              |                                       | 20          |



**GENERIC ELECTIVE COURSE****NANOMATERIALS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D04CHE/PCH</b> | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**Contact hours:36 Hrs**

**Course Outcome**

**On successful completion of this course, students should be able to**

CO 1) Understand the basic concepts of nanoscale science and technology.

CO2) Inculcate the enquiry based learning and increase the level of interest in nanoscience.

CO3) Understand the societal implications and the scope of nanotechnology.

**1. Introduction to Nanomaterials (10hrs)**

Nanotechnology-Definition,Size and Scale, Historical milestone. Medicinal use of gold in ancient India.Nano objects in nature (few examples). Classification of Nanomaterials based on dimesnsions (0D, 1D, 2D, 3D) Examples. Fullerenes, graphenes, carbon nanotubes properties and applications.Polymer nano compositesand their applications (brief study).

**2. Nano particle synthesis (14hrs)**

Biological synthesis using plant extract.Chemical/bottom up method: Chemical precipitation method, Sol gel method, Metal nano crystals by reduction, Microwave irradiation (brief study). Physical- method: Ball milling (Top down), Vapour deposition (brief study). Lab.demonstration of any of the synthesis method.Methods for characterization viz:XRD,SEM,TEM(mention only)

**3. Scope/Applications of Nanotechnology (12 hrs)**

Nano technology for sustainable development: Solar energy conversion (DSSC) and storage (Supercapacitors). Self cleaning surfaces.Water purification using nanomaterials (nanofilters), desalination of water, heavy metal and oil spill removal.Biological applications-Imaging, labeling, targeted drug delivery (preliminary ideas only). Applications in Nanoelectronics, Sports equipments, and cosmetics (brief study).

**References:**

- 1\T. Pradeep, Nano: The Essentials, McGraw Hill Publishing Company, New Delhi (2007).
2. C. N. R. Rao and A.Govindraj, Nanotubes and Nanowires, Royal Society of Chemistry(2005).
- 3V. S. Muraleedharan and A. Subramania, Nanosciece and nanotechnology, Ane Books Pvt. Ltd. New Delhi, 2009.
4. Dr.AshuthoshSharma,Dr.Bellari, Advances in Nanoscience and Nanotechnology- -CSIR Publication 2004
5. G. A. Ozin et.al, Nanochemistry: A Chemical Approach to Nanomaterials – Royal Society of Chemistry, Cambridge, UK 2005.
6. R. Booker and , E. Boysen, Nanotechnology, Wiley India Pvt Ltd, 2008.
7. K. J. Klabunde, Nanoscale materials in chemistry, John Wiley and Sons.
8. S.M. Lindsay, Introduction to Nanoscience, Oxford University Press.
9. K.K. Chattopadhyay and A. N. banergee, Introduction to nanoscience and Technology, PHI learning pvt. Ltd. Delhi.
- 10.Sulabha K. Kulkarni, Nanotechnology Principles and Practices, Capital Publishing Company,Kolkatta.
- 11.<http://www.zyvex.com/nanotech/feynman.html>
- 12.<https://www.azonano.com/>

### Distribution of Marks for Generic Elective Course

#### Marks including choice:

| Unit | Marks |
|------|-------|
| I    | 8     |
| II   | 12    |
| III  | 10    |

Table 10. Type of Questions & Marks for External Examination – Generic Elective Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Marks for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|---------------------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                                     | 5           |
| Short answer         | 5               | 3                               | 2                                     | 6           |
| Short essay/Problems | 5               | 3                               | 3                                     | 9           |
| Total                | 15              | 11                              |                                       | 20          |

**GENERIC ELECTIVE COURSE**  
**CHEMISTRY IN EVERYDAY LIFE**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D05CHE/PCH</b> | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**Contact hours - 36 hours**

**Course Outcome**

CO 1) Identify the harmful ingredients and their effects of cleansing agent and cosmetics

CO 2) Familiarise adulterants in food, food additives and food preservatives

CO 3) Explain the harmful effects of modern food habits

CO 4) Classify the drugs and familiarize the applications of various drugs

CO 5) Understand the consequences of misuse of antibiotics

CO 6) Prepare toilet soap using vegetable oil

**Module 1**

**Cleansing Agents and Cosmetics (12 hrs)**

Cleansing Agents: Soaps - Hard and soft soaps - Alkali content – TFM - Detergents (classification) – Cleaning action - Advantages and disadvantages of soaps and detergents

Shaving creams, Shampoos: Ingredients and functions - Different kinds of shampoos (Anti-dandruff, anti-lice, herbal and baby shampoos).

Tooth paste: Composition and health effects. Cosmetics: Hair dye: Chemicals used and its harmful effects.

Face and skin powders: Types, ingredients and functions. Cleansing creams: Cold creams, vanishing creams and bleach creams.

Perfumes, antiperspirants, Sun screen preparations, nail polishes, lipsticks, eyebrow pencils and eye liners (ingredients and functions) – Harmful effects of cosmetics.

**Module II: Food (10 hrs)**

Common Adulterants in Different Foods: Milk and milk products, vegetable oils, cereals, tea, coffee powder, chilly powder and beverages.

Food Additives and food preservatives – Commonly used permitted and non-permitted food colours

Artificial sweeteners – Taste enhancers - Artificial ripening of fruits and its side effects.

Modern Food Habits: Definition and health effects of fast foods, instant foods, dehydrated foods and junk foods. Harmful effects of modern food habits.

**Module III Practical: (8 Hrs)** Training on Soap Manufacturing

**Module IV**

**MEDICINES (6hrs)**

Drugs- classification-examples and uses . Antibiotics -Discovery, examples and importance. Misuse of antibiotics. Antipyretics ,analgesics and anti-inflammatory agents , narcotic analgesics Anesthetic,

Antiseptic, Anti histamines and tranquillizers, - examples, and use. Disinfectant &germicides examples, .importance and uses.

References

- 1) B.K. Sharma, Industrial Chemistry, 11th Edition, Goel publishing House, Meerut, 2000.
- 2) Lillian Hoagland Meyer, Food Chemistry, 1st Edition, CBS Publishers & Distributors, New Delhi, 2004.
- 3) Brian A. Fox, Allan G. Cameron and Edward Arnold, Food Science, Nutrition and Health, 6th Edition, Edward Arnold, London, 1995.
- 4) . M.S.R. Winter, A Consumer's Dictionary of Cosmetic Ingredients, 7th Edition, Three Rivers Press, New York, 2009.
- 5) 6. Alexander Findlay: Chemistry in the service of man

**Distribution of Marks for Generic Elective Course**  
**Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 8     |
| II   | 8     |
| III  | 10    |
| IV   | 4     |

Table 10. Type of Questions & Marks for External Examination – Generic Elective Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Marks for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|---------------------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                                     | 5           |
| Short answer         | 5               | 3                               | 2                                     | 6           |
| Short essay/Problems | 5               | 3                               | 3                                     | 9           |
| Total                | 15              | 11                              |                                       | 20          |

**COMPLEMENTARY ELECTIVE COURSE****Chemistry for Physical & Biological Sciences**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>I</b>        | <b>1C01CHE/PCH</b> | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**Contact Hrs –36****Course Outcome****On successful completion of this course, students should be able to**

- CO1) Understand the atomic structure, basics of quantum chemistry and its applications.
- CO2) Explain theories of chemical bonding and molecular structure.
- CO3) Classify environmental pollution and recognise the causes of pollution
- CO4) Understand the basic concept of Chemical equilibrium and theories of acids and bases
- CO 5) Calculate pH values
- CO 6) Explain common ion effect and solubility product

**UNIT I : Atomic Structure and Periodic Table (10 hrs)**

Bohr atom Model (No derivation) – Atomic Spectra of Hydrogen – limitations – wave mechanical concept of atom – Heisenberg’s Uncertainty Principle – Dual nature of electrons – De Broglie equation – quantum numbers. Orbit and orbitals – Wave function and significance of  $\psi^2$ . Schrodinger equation (no derivation). The periodic table – periods and groups-s, p, d and f block elements – modern concept – periodic trends – atomic radii, ionic radii & covalent radii – effective nuclear charge and screening effect – Ionization potential – electro negativity and electron gain enthalpy.

**UNIT II : Chemical bonding (10 hrs)**

Types of chemical bonds-Ionic, covalent and co-ordinate bonds. Lattice energy of ionic compounds – Born Haber cycle. VSEPR theory and its applications. Shape of molecules  $\text{CO}_2$ ,  $\text{BeF}_2$ ,  $\text{BF}_3$ ,  $\text{CH}_4$ ,  $\text{NH}_3$ ,  $\text{H}_2\text{O}$ ,  $\text{NH}_4^+$ ,  $\text{PCl}_5$ ,  $\text{SF}_6$ ,  $\text{ClF}_3$ . Orbital overlapping – Hybridization  $sp$ ,  $sp^2$ ,  $sp^3$ ,  $sp^3d$ ,  $sp^3d^2$ ,  $d^2sp^3$  and  $dsp^2$  hybridization. V.B Theory. MO theory. Formation of  $\text{B}_2$ ,  $\text{C}_2$ ,  $\text{N}_2$  and  $\text{O}_2$  molecules. Hydrogen bonding, types of hydrogen bonding – example

**UNIT III : Environmental Chemistry (10 hrs.)**

Introduction-environment and segments- Pollutants of water – sewage, industrial effluents, soap and detergents, pesticides, fertilizers, heavy metals, Biological magnification and

[Type text]

bioaccumulation, Toxic effect of pollutants, Water quality parameters – DO, BOD and COD, Water purification- sedimentation, coagulation, filtration, disinfection, ion exchange, desalination, Air pollution – major regions of atmosphere, pollution by oxides of N, S, C, hydrocarbons and other organic chemicals, automobile exhausts, their physiological effects on vegetation and living organisms, Ozone layer – importance – depletion of ozone – consequences, Greenhouse effect – global warming – acid rain, Toxicity and environmental hazards of pesticides, Radiation pollution and noise pollution.

#### **UNIT IV :Ionic Equilibrium (6 Hrs)**

Concepts of Acids and Bases-Arrhenius, Lowry- Bronsted and Lewis concepts, ionization of weak electrolytes. pH and pOH values. Buffer solutions and calculations of their pH. Henderson equation (numerical problems expected). Solubility product and common Ion effect. Hydrolysis of salt – degree of hydrolysis and hydrolytic constant, derivation of relation between  $K_w$  and  $K_h$  for salts of strong acid – weak base, weak acid – strong base and weak acid – weak base.

#### **Distribution of Marks for Complementary Elective Course**

##### **Marks including choice:**

| Unit | Marks |
|------|-------|
| I    | 14    |
| II   | 14    |
| III  | 14    |
| IV   | 10    |

#### Type of Questions & Marks for External Examination- Complementary Elective Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                      | 5           |
| Short answer         | 6               | 4                               | 2                      | 8           |
| Short essay/Problems | 5               | 3                               | 3                      | 9           |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 20              | 14                              |                        | 32          |



**COMPLEMENTARY ELECTIVE COURSE****Chemistry for Physical & Biological Sciences**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>II</b>       | <b>2C02CHE/PCH</b> | <b>2</b>                  | <b>2</b>      | <b>3</b>            |

**Contact Hrs – 36**

**Course Outcome**

**On successful completion of this course, students should be able to**

CO 1) Understand the basic concept of classification, IUPAC nomenclature, bonding and structure of Organic compounds

CO2) Explain the concept of aromaticity and non-benzenoid aromatics

CO3) Understand the basic concepts of chemical equilibrium . Explain colloids, their properties and applications

CO4) Illustrate the laws of photochemistry and Explain the photochemical phenomena such as Photosensitization, quenching, Fluorescence, Phosphorescence, Chemi luminescence and bioluminescence.

CO5) Familiarise different types of analytical methods in chemistry and explain the principle of colorimetry

CO 6) Explain the principles underlying the qualitative and quantitative analysis

**UNIT I : : Introduction to organic chemistry (8 Hrs)**

Classification of organic compounds – functional groups, Homologous series – Hybridization and shapes of molecules like methane, ethane, ethylene and acetylene – IUPAC nomenclature of hydrocarbons, organic compounds bearing functional groups – Structure of Benzene –

Aromaticity-Huckel's rule. Non Benzenoid Aromatic systems-cyclopropenyl cation, cyclopentadienyl anion, tropylium cation, Pyrrole, Pyridine

Bond fission – homolysis and heterolysis – carbonium ion – carbanion – and free radicals.

**. UNIT II : Chemical equilibrium (6 hours)**

Reversible reactions – Law of mass action – relationship between  $K_c$ ,  $K_p$  and  $K_x$ - thermo dynamic

derivation of chemical equilibrium. Liquid systems – Le-Chatlier's Principle – Effects of temperature, pressure and concentrations.

[Type text]

**UNIT III : Photochemistry (4 hrs)**

Chemical reactions Vs Photochemical Reactions. Laws of photo chemistry – Grotthus – Draper Law and Stark-Einstein law of photo chemistry. Beer Lambert Law- Quantum yield – Photo sensitization and quenching- Fluorescence and Phosphorescence – Chemiluminescence and bioluminescence.

**UNIT IV : Colloids (8 hrs)**

Classification – preparation – structure and stability – The electrical double layer – zeta potential – Properties of Colloids – Tyndall effect – Brownian movement- Coagulation of colloidal solution – Hardy-Schultz rule – Flocculation value – protective colloids – Gold number – Emulsions – oil in water and water in oil type emulsions – Emulsifying agents – Gels – imbibition – syneresis – applications of colloids in food, medicine and industry.

**UNIT V : Analytical Chemistry (10hrs)**

Analytical chemistry – Types of analytical methods –Qualitative and Quantitative analysis, Electrochemical methods, Spectroscopic analysis, Thermal methods (introduction only) –

Accuracy and precision. Errors-classification

Inorganic Qualitative analysis - Solubility product – ionic product – common ion effect- principle of separation of cations in various groups.

Concept of molarity, Normality, Molality (numerical problems expected). Principle of volumetric analysis – Acidimetry and alkalimetry, permanganometry, dichrometry, iodometry and iodimetry.

Colorimetry – Beer-Lamberts law-applications.

### Distribution of Marks for Complementary Elective Course

#### Marks including choice:

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 12    | V    | 13    |
| II   | 9     |      |       |
| III  | 6     |      |       |
| IV   | 12    |      |       |

#### Type of Questions & Marks for External Examination- Complementary Elective Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                      | 5           |
| Short answer         | 6               | 4                               | 2                      | 8           |
| Short essay/Problems | 5               | 3                               | 3                      | 9           |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 20              | 14                              |                        | 32          |

**COMPLEMENTARY ELECTIVE COURSE**

**Chemistry for Physical Science**

| <b>SEMESTER</b> | <b>COURSE CODE</b>     | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|------------------------|---------------------------|---------------|---------------------|
| <b>III</b>      | <b>3C03CHE/PCH(PS)</b> | <b>3</b>                  | <b>2</b>      | <b>3</b>            |

**Contact Hrs –54**

**Course Outcome**

**On successful completion of this course, students should be able to**

CO1) Understand the basic principle underlying various spectroscopy

CO2) Understand the basic concepts of thermodynamics and laws of thermodynamics

CO3) Explain the formation, nomenclature and applications of coordination complexes,

Illustrate the valence bond theory of coordination complexes and explain the factors

affecting the stability of complexes

CO4) Understand the basic concepts of chemical kinetics and Calculate the value of  $E_a$  from the values of  $k$  at two temperatures. Illustrate the types of Catalysis and understand the Characteristics of catalytic reactions

CO 5) Understand the basic concept of nuclear chemistry, and explain the detection of isotopes using Aston's mass spectrograph and separation of isotopes by diffusion methods

CO6) Explain the principle and applications of different types of Chromatography

**Module I : Spectroscopy (9 Hrs)**

Electromagnetic spectrum- Ranges of different radiation- general features of spectroscopy- Types of spectra – Rotational, vibrational and electronic spectra. Rotational spectra - Moment of inertia-rotational constant and bond length.

Vibrational spectra – stretching and bending modes-Force constant-Zero point energy.

Raman spectra – Stokes and Anti Stokes Lines – NMR spectra-chemical shift and spin-spin splitting.

**Module II : Thermodynamics (8Hrs)**

Basic Concepts – System – surroundings – open, closed and isolated systems – heat – energy – internal energy – Isothermal –isochoric and isobaric process – Reversible and irreversible processes- work of expansion of an ideal gas in reversible isothermal work –Heat capacity at

[Type text]

constant volume ( $C_v$ ) and at constant pressure ( $C_p$ ) – relation between  $C_p$  and  $C_v$  – First law – The second law – Enthalpy-Entropy-and Free energy- significance of  $\Delta G$ ,  $\Delta H$  and available work-Criteria for reversible and irreversible process - Gibbs –Helmholtz equation(no derivation)- criteria of spontaneous and non spontaneous processes.

### **Module III : Co-ordination compounds (8 Hrs)**

Co-ordination compounds and complex ions –co-ordination number-Ligands – Types - unidentate- bidentate -polydentate ligands– Werners theory – Nomenclature of co-ordination compounds – Effective Atomic Number Rule – Factors affecting the stability of complex ions – valence bond theory of complexes –application of complexes.

### **Module IV : Chemical kinetics and catalysis (11hrs)**

Definition – reaction rate – factors affecting the rate of a chemical reaction – units – Zero order reactions – Order versus molecularity. Pseudo order reactions – Integrated rate equation for first order reaction – half life – determination of the order – Half life method and Graphical method – Ester hydrolysis – rate equation. Collision theory (qualitative) Effect of temperature on reaction rate

Calculation of  $E_a$  from the values of  $k$  at two temperatures. Transition state theory (qualitative). Types of catalysis – homogeneous and heterogeneous. Characteristics of catalytic reactions – promoters and catalytic poisons. Activation energy and catalysts.

### **Module V : Nuclear Chemistry (10 hrs)**

Concept of nuclides – representation of nuclides – isobars, isotopes and isotones with examples – Detection of isotopes using Aston's mass spectrograph – separation of isotopes by diffusion methods – stability of nucleus –  $n/p$  ratio. Liquid drop model, Radioactivity – natural and artificial. Decay constant and half-life period-Radioactive series – Group displacement law – radio isotopes and their applications in structural elucidation, in agriculture and in industry – Radiocarbon dating – Nuclear fission and nuclear fusion. Problems associated in the nuclear waste disposal. Derivation of decay constant – Atom bomb and hydrogen bomb. Mass defect, Nuclear binding energy.

### **Module VI: Chromatography (8 hrs)**

Introduction - Adsorption and partition chromatography - Principle and applications of column, thin layer, paper, Liquid and gas chromatography, HPLC, Ion Exchange chromatography (IEC) -  $R_f$  value – Relative merits of different techniques.

**Distribution of Marks for Complementary Elective Course****Marks including choice:**

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 9     | V    | 9     |
| II   | 9     | VI   | 6     |
| III  | 9     |      |       |
| IV   | 10    |      |       |

**Type of Questions & Marks for External Examination- Complementary Elective Course**

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                      | 5           |
| Short answer         | 6               | 4                               | 2                      | 8           |
| Short essay/Problems | 5               | 3                               | 3                      | 9           |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 20              | 14                              |                        | 32          |

**COMPLEMENTARY ELECTIVE COURSE****Chemistry for physical science**

| <b>SEMESTER</b> | <b>COURSE CODE</b>     | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|------------------------|---------------------------|---------------|---------------------|
| <b>IV</b>       | <b>4C04CHE/PCH(PS)</b> | <b>3</b>                  | <b>2</b>      | <b>3</b>            |

**Contact Hrs –54**

**Course Outcome**

**On successful completion of this course, students should be able to**

CO1) Understand the basic concept in gaseous state Explain the deviation of real gases from ideal behavior and Maxwell distribution of velocities and its use in calculating molecular velocities. Distinguish average velocity, RMS velocity and most probable velocity

CO 2) Understand the basic concepts of internal structure of Crystals (crystallography) and explain X-ray analysis of crystals

CO3) Understand the basic concepts in liquid state and solutions .Illustrate Henry's law and explain its applications. Identify colligative properties and apply colligative properties to determine molecular mass

CO4) Distinguish Specific conductance – molar conductance and equivalent conductance and explain laws of electrolysis , conductometric titrations and its applications

CO5) Explain electrochemical cell ,electrode potential , types of electrodes ,EMF Nernst equation and potentiometric titration

CO6) Acquaint with various instrumental methods in chemistry and Understand basic concepts of nanochemistry

**UNIT I: Gaseous State (9Hrs)**

Gaseous State: Introduction - Kinetic molecular model of gases – Maxwell distribution of velocities and its use in calculating molecular velocities – Average velocity, RMS velocity and most probable velocity (derivations not required) – collision number and collision frequency, mean free path- Boyle's law – Charles's law – Ideal gas equation – Behaviour of real gases – Deviation from ideal behaviour - Van der Waals equation (derivation not required). Joule-Thomson effect and Liquifaction of gases .

[Type text]

**UNIT II : Crystalline State (9 Hrs)**

Solids – crystalline and amorphous solids – space lattice and unit cell- crystal planes laws of crystallography – Weiss indices and Miller indices - Bravais lattice – Bravais lattices of cubic crystals – characteristic planes in these lattices – interplanar distance ratio – X-ray analysis of crystals – Bragg's equation – problem – crystal structure of NaCl – Liquid crystals – types, properties and applications.

**UNIT III: Liquid State and Solutions (10 hrs)**

Liquid State: Introduction - Vapour pressure – Raoult's law- surface tension and viscosity – Explanation of these properties on the basis of intermolecular attraction.

Solutions: Kinds of solutions - Solubility of gases in liquids – Henry's law and its applications - Colligative properties - Determination of molecular mass using colligative properties.

Introduction to liquid crystals-classification and properties

**Unit IV Electrochemistry(6 hrs)**

Specific conductance – molar conductance and equivalent conductance – variation with dilution. Ohm's law - Conductors - metallic and ionic conductors

Electrolysis – laws of electrolysis –. Electrolytic conduction - Migration of ions – relative speed of ions – Transport number. Kohlrausch's law and applications. Conductometric titrations – advantages

**UNIT V : Electromotive force (8 Hrs)**

Electro chemical cell – Daniel cell – Cell reaction – Single electrode potential – statement – explanation of Nernst equation – Standard hydrogen electrode – Calomel electrode

– measurement of EMF – determination of pH using Hydrogen electrode – Potentiometric titration – concentration cells.

**UNIT VI :Instrumental methods of Analysis(6 Hrs)**

Principles of TGA, DTA, AAS, Spectrophotometry, Potentiometric Titration and their Applications

**UNIT VII ::Chemistry of Nano Materials (6hrs)**

Evolution of Nano science – Historical aspects – preparations containing nano gold in traditional medicine, Lycurgus cup – Faraday's divided metal etc. Nanosystems in nature. Preparation of Nano particles – Top – down approach and bottom – up approach, sol – gel synthesis, colloidal



precipitations, Co- precipitation, combustion technique. Properties of nano particles: optical, magnetic and mechanical properties.

### **Distribution of Marks for Complementary Elective Course**

#### **Marks including choice:**

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 10    | V    | 8     |
| II   | 7     | VI   | 5     |
| III  | 9     | VII  | 6     |
| IV   | 7     |      |       |

#### Type of Questions & Marks for External Examination- Complementary Elective Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                      | 5           |
| Short answer         | 6               | 4                               | 2                      | 8           |
| Short essay/Problems | 5               | 3                               | 3                      | 9           |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 20              | 14                              |                        | 32          |

**COMPLEMENTARY ELECTIVE COURSE**

**Chemistry for Biological Sciences**

| <b>SEMESTER</b> | <b>COURSE CODE</b>          | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|-----------------------------|---------------------------|---------------|---------------------|
| <b>III</b>      | <b>3C03CHE/PCH<br/>(BS)</b> | <b>3</b>                  | <b>2</b>      | <b>3</b>            |

**Contact Hrs –54**

**Course Outcome**

**On successful completion of this course, students should be able to**

CO1) i) Understand the basic concept of Coordination Chemistry, nomenclature, Werner's coordination theory and Valence bond theory of coordination complexes

ii) Write the name of Coordination compounds

iii) Explain Werner's coordination theory and Valence bond theory of coordination complexes

iv) Explain the application of coordination complexes

CO2) i) Understand the electron displacement effects in organic molecules

ii) Explain the mechanism of nucleophilic substitutions and eliminations in alkyl halides

iii) Explain the mechanism of aromatic electrophilic substitution reactions

CO3) i) Classify the isomerism in organic molecules

ii) Distinguish the geometrical isomers and explain their stability

iii) Explain the characteristics of chiral compound

iv) Explain the conformational isomers in alkanes and cycloalkanes

CO 4) i) Explain the important types of polymerization, thermoplastics and thermosetting plastics

ii) Understand the characteristics of biodegradable plastics

CO 5) Understand the basic concept of thermodynamics and laws of thermodynamics

CO6) i) Understand the basic concept of chemical kinetics

ii) Calculate  $E_a$  from the values of  $k$  at two temperatures

iii) Explain homogeneous catalysis, heterogeneous catalysis and Characteristics of catalysis reactions

**UNIT I Co-ordination Chemistry( 9 hrs)**

Co-ordination compounds and complex ions – co-ordination number - Ligands-types - unidentate, bidentate, polydentate ligands – Werners theory – Nomenclature of co-ordination compounds – Effective Atomic Number Rule, significance – Factors affecting the stability of complex ions – valence bond theory of complexes - application of complexes.

**UNIT II : Organic reaction mechanisms****(10 hrs)**

Classifications of organic reactions – Electron displacement effects- Inductive, Electromeric, Resonance, Hyper conjugative, Steric effects. Mechanisms of  $SN_1$  and  $SN_2$  reaction. Walden inversion. Elimination reactions –  $E_1$  and  $E_2$  reactions. Addition of hydrohalogen acids – Markownikoff's rule – peroxide effect. Aromatic electrophilic substitution reactions - chlorination, nitration, sulphonation and Friedel Crafts reaction

**UNIT III : Stereochemistry****(9 hrs)**

Isomerism – general – stereoisomerism – optical isomerism – chirality – plane polarized light – specific rotation – enantiomerism – racemization – diastereo isomer – optical activity of lactic acid and tartaric acid – meso tartaric acid – resolution – conformational isomerism – ethane, propane and cyclohexane – chair and boat forms- stability – geometrical isomerism – causes – maleic acid and fumaric acid – 1-butene and 2-butene stability.

**UNIT IV : Introduction to Polymer Chemistry****(8 hrs.)**

Types of polymerization: Chain polymerization, step polymerization – homopolymers and copolymers phenol formaldehyde, urea formaldehyde polymers – Natural rubber and synthetic rubbers – Synthetic fibers– Thermoplastics and Thermosetting plastics – pollution due to plastics – Biodegradable plastics.

**UNIT V : Thermodynamics****(9 Hrs)**

Basic concepts– System – surroundings – open, closed and isolated systems – Isothermal – isochoric and isobaric process – work – heat – energy – internal energy – Heat capacity at constant volume ( $C_v$ ) and at constant pressure ( $C_p$ ) – relation between  $C_p$  and  $C_v$  – First law– The second law – Enthalpy-Entropy-and Free energy-Criteria for reversible and irreversible process- Gibbs –Helmholtz equation(no derivation) concepts of spontaneous and non spontaneous processes.

**UNIT VI : Chemical kinetics and catalysis****(9hrs)**

Definition – reaction rate – factors affecting the rate of a chemical reaction – units – Zero order reactions – Order versus molecularity. Pseudo order reactions – Integrated rate equation for first order reaction – half life – Ester hydrolysis – equation. Collision theory (qualitative) Effect of temperature on reaction rate – calculation of  $E_a$  from the values of  $k$  at two temperatures. Transition state theory (qualitative). Types of catalysis – homogeneous and heterogeneous. Characteristics of catalysis reactions – promoters and catalytic poisons. Activation energy and catalysis.

**Distribution of Marks for Complementary Elective Course****Marks including choice:**

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 10    | V    | 9     |
| II   | 10    | VI   | 9     |
| III  | 8     |      |       |
| IV   | 6     |      |       |

**Type of Questions & Marks for External Examination- Complementary Elective Course**

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                      | 5           |
| Short answer         | 6               | 4                               | 2                      | 8           |
| Short essay/Problems | 5               | 3                               | 3                      | 9           |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 20              | 14                              |                        | 32          |

**COMPLEMENTARY ELECTIVE COURSE****Chemistry for Biological Sciences**

| <b>SEMESTER</b> | <b>COURSE CODE</b>           | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|------------------------------|---------------------------|---------------|---------------------|
| <b>IV</b>       | <b>4C04CHE /PCH<br/>(BS)</b> | <b>3</b>                  | <b>2</b>      | <b>3</b>            |

**Contact Hrs –54**

**Course Outcome**

**On successful completion of this course, students should be able to**

CO1) Illustrate the preparatory methods of glucose and fructose and explain their configurations

Familiarize the structure and properties of sucrose and poly saccharides

CO2) Know the structure of important five membered and six membered heterocyclic compounds

and explain their reactivity and important reactions .Explain the preparation and properties of Quinoline and iso quinoline

CO 3) Understand the structure and functions of nucleic acids , Classify amino acids and explain the structure of protein and its importance

CO4) Understand the mechanism of enzyme action , enzyme catalysis

CO5) Know the structure of Vitamin A, B and C. and hormones progesterone, Testosterone, cortisone, adrenaline and Thyroxin

CO6) Understand the importance of metal ions in biological systems and Mechanism of O<sub>2</sub> and CO<sub>2</sub> transportation – Nitrogen Fixation Na-K pump

**UNIT I : Carbohydrates (9 hrs)**

Introduction – Definition and classification. Preparation and properties of Glucose, Fructose and Sucrose – Mutarotation – Epimers and Anomers. D and L configuration. Conversion of glucose into fructose and fructose into glucose. Cane sugar – Structure and important properties – Polysaccharides. Starch, Cellulose and Chitin – structure, properties and tests.

**UNIT II : Heterocyclic compounds (10 hrs)**

Introduction to Heterocyclic systems ( 5 membered, 6 membered and condensed systems. )

Structure of pyrrole, Furan and Thiophene. Electrophilic substitution in pyrrole, Furan and

Thiophene. Reactivity and orientation – Saturated 5 numbered heterocyclics – Structure and

[Type text]

properties of pyridine. Electrophilic and nucleophilic substitution reactions in pyridine – Basicity and reduction. Quinoline and isoquinoline – preparation and properties.

**UNIT III : Nucleic acids**

**(7 hrs)** Classification – Purine

and pyrimidine bases - structure of DNA and RNA – Functions of Nucleic Acids – DNA replication – Bio synthesis of Proteins – Test for DNA and RNA. Effect of hydrogen bonding in biological systems.

**UNIT IV : Amino acids and proteins**

**(9 hrs)**

Classification of Amino acids – Physical and Chemical Properties – Zwitter ions – Iso Electric point – Sorensens formal titration – chromatographic separation of amino acids – Peptides – Proteins classification, characterization by electrolysis – Primary, Secondary and Tertiary level structures of proteins – Tests for Proteins.

**UNIT V : Enzymes, Vitamins and Hormones**

**(10 hrs)**

Enzymes – General Nature – Mechanism of Enzyme action, Enzyme catalysis, Michaelis – Menten equation (No derivation) – Application of Enzymes, Enzyme deficiency diseases – Vitamins – Classifications structure of Vitamin A, B and C. Hormones – Classification – Structures of progesterone, Testosterone, cortisone, adrenaline and Thyroxine.

**UNIT VI : Bio inorganic compounds**

**(9 hrs)**

Introduction - Metal ions in biological system – Metals in medicine – metal – nucleic acid interaction – biochemistry of iron – haemoglobin and myoglobin – structure and functions – Mechanism of O<sub>2</sub> and CO<sub>2</sub> transportation – Nitrogen Fixation Na-K pump – Bio chemistry of Zn Co and Ca in biological system.

**Distribution of Marks for Complementary Elective Course**

**Marks including choice:**

| Unit | Marks | Unit | Marks |
|------|-------|------|-------|
| I    | 10    | V    | 10    |
| II   | 8     | VI   | 8     |
| III  | 6     |      |       |
| IV   | 10    |      |       |

## Type of Questions &amp; Marks for External Examination- Complementary Elective Course

|                      | Total Questions | No. Of Questions to be answered | Mark for each Question | Total Marks |
|----------------------|-----------------|---------------------------------|------------------------|-------------|
| Very short answer    | 5               | 5                               | 1                      | 5           |
| Short answer         | 6               | 4                               | 2                      | 8           |
| Short essay/Problems | 5               | 3                               | 3                      | 9           |
| Essay                | 4               | 2                               | 5                      | 10          |
|                      | 20              | 14                              |                        | 32          |

**References:**

1. Inorganic chemistry : Puri and Sharma
2. Inorganic chemistry : P.L.Soni
3. Concise inorganic chemistry : J.D.Lee
4. Basic inorganic chemistry : Cotton and Wilkinson
5. Physical Chemistry : Puri and Sharma
6. Physical Chemistry P.L.Soni and Dharmarah
7. Elements of Physical Chemistry Glasstone and Lewis
8. University Chemistry Bruce M Mahan and Rollie J Myers
9. Basic Physical Chemistry Moore W.J
10. Essentials of Physical Chemistry Bahl,Tuli and Arun
11. Advanced organic Chemistry : Jerry March
12. Organic Chemistry Morrison and Boyd
13. Environmental Chemistry A.K.De
14. Organic Chemistry Vol. 1 and II I.L.Finar
15. Polymer Chemistry Gawarikar and Vishvanadhan
16. Organic reaction mechanism : Peter Sykes
17. Organic reaction mechanism : Mukherjee and Singh
18. Organic photochemistry: Depuy and Chapman
19. Organic Spectroscopy William Kemp
20. Pragathi's Instrumental Methods of Analysis : H.Kaur

**SEMESTER I, II, III & IV****4C05 CHE/PCH- COMPLEMENTARY ELECTIVE - CHEMISTRY PRACTICAL****COURSE OUTCOME**

**On successful completion of this course, students should be able to**

CO 1) Apply the theoretical concepts while performing experiments.

CO2 ) Acquire practical skill to estimate acid, base, oxidizing agents etc by volumetric titration method

CO3) Acknowledge experimental errors and their possible sources.

CO 4) Design, carry out, record and analyze the results of chemical experiments

CO5) Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts

CO 6) Learns the effective usage of chemicals

1. Qualitative Inorganic Mixture Analysis

a. Reactions of cations:

Study of the reactions of the following cations with a view of their identification and confirmation.

Lead, Copper, Iron, Aluminium, Zinc, Manganese, Cobalt, Nickel, Barium, Calcium, Magnesium and Ammonium.

b. Systematic qualitative analysis of a solution containing any two of the cations given in

(a) by semi micro methods.

2. Volumetric Analysis

(a) Introduction to electronic balance and analytical balance - volumetric apparatus -

filtration, Equivalent and molecular mass of compounds - Normality and Molarity - Primary standards - Preparation of standard solution - Principles of Volumetric analysis.

(b.) For acidimetry, alkalimetry and permanganometry two burette method may be used and for other volumetric analyses conventional methods can be used. (Students should prepare standard solutions. The experiments should have the making up of the given solution and double titration in each experiment.

a. Acidimetry and alkalimetry - Estimation of (a) strong acids (b) strong bases (c) weak acids (d) weak bases.

[Type text]



b. Permanganometry ;Estimation of (a)  $\text{Fe}^{2+}/\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ /Mohr's salt (b) Oxalic acid

c. Dichrometry

Estimation of (a)  $\text{Fe}^{2+}$  using internal indicator (b)  $\text{Fe}^{3+}$  after reduction with stannous chloride/ $\text{HCl}$

d. Iodimetry and iodometry

Estimations of (a) copper (b) potassium dichromate and (c) Potassium permanganate.

VIVA VOCE

References

|    |                                                |               |
|----|------------------------------------------------|---------------|
| 1. | A Text Book of Qualitative Analysis            | A.I.Vogel     |
| 2. | Semi micro Qualitative Analysis                | V.V.Ramanujan |
| 3. | A Text Book of Quantitative inorganic Analysis | A.I.Vogel     |
| 4. | Practical chemistry for B.Sc Chemistry         | A.O.Thomas    |

### MODEL QUESTION COMPLEMENTARY CHEMISTRY PRACTICAL

Time : 4 Hours

Credit: 4      Total    32 marks

- Identify and confirm the two Cations in the given solution by systematic qualitative analysis. Submit a record of your tests, observation and inferences along with the report.
- Determine the amount of  $\text{HNO}_3$  in the Whole of the given solution You are provided with Pure Crystalline  $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$  and Approximately N/10 NaOH Solution.
- In the first ten minutes,
  - Write a brief outline of the procedure you would adopt for the estimation of Copper in the given solution of Copper Sulphate, given With A.R. potassium dichromate and N/10 Sodium thiosulphate.
  - Calculate the mass of crystalline Copper Sulphate required to prepare 200 ml 0.2 N Solution.
- Viva Voce

**Pattern of Question paper for U.G Core Courses (Chemistry)-Theory  
KANNUR UNINERSITY**

Reg. No.:

Name:

------(Semester).....(Programme)

.....(Course code).....(Course title)

Total marks: 40

Time: 3hrs.

Answer the questions in English only

Section A

(very short answer type - Each carries 1 mark -Answer all 4 questions)

1. ....

2. ....

3. ....

4. ....

[4x1=4 marks]

Section B

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. ....

6. ....

7. ....

8. ....

9. ....

10.....

11. ....

12. ....

13. ....

14. ....

[7x2=14 marks]

[Type text]

Section C

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. ....

16. ....

17.....

18. ....

19.....

20. ....

[4x3=12 marks]

Section D

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21.....

22.....

23. ....

24.....

[2 x 5= 10 marks]

**Pattern of Question paper for U.G Complementary Courses (Chemistry)-Theory**

Reg. No.:

Name:

------(Semester).....(Programme)

.....(Course code).....(Course title)

Total marks: 32 Time: 3hrs.

write only in English

**Section A**

(very short answer type - Each carries 1 mark -Answer all 5 questions )

- 1.
- 2.
- 3.
- 4.
- 5.

**Section B**

(Short answer type - Each carries 2 mark -Answer 4 questions out of 6 )

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

**Section C**

(Short essay type - Each carries 3 mark -Answer 3 questions out of 5)

- 12.
- 13.
- 14.
- 15.
- 16.

**Section D**

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4 )

[Type text]

- 17.
- 18.
- 19.
- 20.

**Pattern of Question paper for U.G Generic Elective Course**

Reg. No.:

Name:

------(Semester).....(Programme)

.....(Course code).....(Course title)

Total marks: 20 Time: 2 hrs.

Answers can be written only in English

Section A

(very short answer type- Each carries 1 mark -Answer all 5 questions )

- 1.
- 2.
- 3.
- 4.
- 5.

Section B

(Short answer type - Each carries 2 mark -Answer 3 questions out of 5 )

- 6.
- 7.
- 8.
- 9.
- 10.

Section C

(Short essay type - Each carries 3 mark -Answer 3 questions out of 5)

- 11.
- 12.
- 13.
- 14.
- 15.

[Type text]





**KANNUR UNIVERSITY**  
**(Abstract)**

B.A. Economics/ Development Economics Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

---

**ACADEMIC BRANCH**

No.Acad.C1/12530/2019

Dated, Civil Station P.O., 20 .06. 2019

- 
- Read:-
1. U.O.No.Acad.C2/429/2017 dated,10-10-2017
  2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
  3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.
  4. The Minutes of the Meeting of the Board of Studies in Economics (UG) held on 07.06.2019
  5. Letter and Syllabus of B.A. Economics/ Development Economics Programme , Submitted by the Chairperson, Board of Studies in, Economics (UG) dated , 15.06.2019

**ORDER**

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies ,Workshops, discussions etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Economics (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.A.Economics/ Development Economics Programmes to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Economics (UG) submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.A. Economics/ Development Economics Programmes for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper (Core/Complementary Elective/Generic Elective Course) of B.A Economics/ Development Economics programmes under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.A Economics/ Development Economics Programmes are uploaded in the University website.  
( [www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in))

Orders are issued accordingly.

Sd/-

DEPUTY REGISTRAR(ACADEMIC)  
For REGISTRAR

To

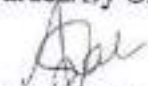
The Principals of Colleges offering B.AEconomics/ Development Economics Programme

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Economics (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC



Forwarded/By Order

  
SECTION OFFICER





# **KANNUR UNIVERSITY**

## **BOARD OF STUDIES, ECONOMICS (UG)**

**SYLLABUS FOR B A PROGRAMME IN  
ECONOMICS/DEVELOPMENT ECONOMICS CORE,  
COMPLEMENTARY ELECTIVE COURSE  
AND GENERIC ELECTIVE COURSES**

**CHOICE BASED CREDIT AND SEMESTER SYSTEM**

**(2019 ADMISSION ONWARDS)**

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## KANNUR UNIVERSITY



### VISION AND MISSION STATEMENTS

**Vision:** To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

**Mission:**

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

# KANNUR UNIVERSITY

## PROGRAMME OUTCOMES (PO)

---

### **PO1. Critical Thinking**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

### **PO2. Effective Citizenship**

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

### **PO3. Effective Communication**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

### **PO4. Inter disciplinarity**

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

## **PREFACE**

Economic science has become one of the most dynamic and complex disciplines across natural, physical and social sciences. Its scientific as well as dynamic character has strengthened not only the scope of economics but positively contributed to other streams of knowledge as well. The new BA syllabi of Kannur University have greater scope for using mathematical and statistical techniques, apart from theory and policy. Further it has become more interdisciplinary or/ and multidisciplinary in terms of methods of enquiry and modes of analysis. In the revised syllabi we have incorporated new frontiers of economics such as gender economics, economic geography, economic history, heterodox economics, econometrics and mathematical economics. These interdisciplinary /multidisciplinary areas will strengthen the integrated knowledge profile of the students. Restructuring was done under the initiative of Kannur University and the active involvement of the Members of the Board of Studies in Economics (UG) through a series of deliberations and discussions. In order to make it more participatory and democratic, we have organized a two day workshop to finalize the restructured curriculum and the outcome based syllabi for the BA Economics Programme. Undergraduate economics teachers of all colleges affiliated to Kannur University have actively participated in the workshop and made significant contributions towards the Outcome Based Under Graduate Education. Apart from teachers of affiliated colleges, faculty members of national repute have been invited as resource persons to streamline the syllabi in terms of method, content, and integrity of its epistemology. The basic objective of the revised syllabi is to equip our undergraduates to face the academic and real life challenges in the fast changing world tuned by knowledge revolution, science, technology, research and development. We believe that the revised curriculum and syllabi may open new horizons of knowledge and meet the vision and mission of higher education in the country. It is our privilege to introduce the revised curriculum and syllabi before the fresh undergraduates who are getting enrolled in June 2019 onwards and other stake holders of Economics Undergraduate Education.

Dr. A. Ashokan  
Chairperson  
Board of Studies, Economics (UG)  
Kannur University

**Kannur University**  
**Programme Specific Outcome of B.A Economics /**  
**Development Economics Programme**

The revised curriculum and syllabi of BA Economics Programme of Kannur University provide a structure of core courses, complementary elective courses and generic elective courses. Diversified course structure will contribute towards all round development of the student. The undergraduate programme in economics borrows ideas and techniques from a variety of other disciplines including history, geography, mathematics, statistics, management and environmental science. An undergraduate programme with sound footing in economic theory and empirics would equip the students to a range of career options in the field of economics, finance, commerce, entrepreneurship and management. The specific outcomes of the programme are summarized below:

1. The programme with structured curricula will support the academic development of the undergraduates.
2. The programme will provide the students with the opportunity to pursue courses that emphasize quantitative, qualitative and theoretical aspects of economics.
3. The programme will provide a well resourced teaching learning environment for the students of economics, which will definitely lead to the ultimate educational goal of “learning to be”.
4. The programme will promote academic writing, critical thinking and research aptitude among the students.
5. Needless to point out, the students will gain a source of livelihood by expanding their skill set and widening their knowledge horizon.

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**KANNUR UNIVERSITY**  
**B A ECONOMICS PROGRAMME**  
**WORK AND CREDIT DISTRIBUTION STATEMENT**

(BA: Common English: 22, Additional Common: 16, Core: 64,  
 First Complementary Elective: 8, Second Complementary Elective: 8, Generic Elective: 2)

| Semester                                   | Course Title*                                         | Credits     | Hours per week | Total Credits | Total Hours |
|--------------------------------------------|-------------------------------------------------------|-------------|----------------|---------------|-------------|
| <b>I</b>                                   | Common English I                                      | 4           | 5              | 20            | 25          |
|                                            | Common English II                                     | 3           | 4              |               |             |
|                                            | Additional Common I                                   | 4           | 4              |               |             |
|                                            | Microeconomic Analysis I                              | 5           | 6              |               |             |
|                                            | Complementary I                                       | 4           | 6              |               |             |
| <b>II</b>                                  | Common English III                                    | 4           | 5              | 19            | 25          |
|                                            | Common English IV                                     | 3           | 4              |               |             |
|                                            | Additional Common II                                  | 4           | 4              |               |             |
|                                            | Microeconomic Analysis II                             | 4           | 6              |               |             |
|                                            | Complementary II                                      | 4           | 6              |               |             |
| <b>III</b>                                 | Common English V                                      | 4           | 5              | 21            | 25          |
|                                            | Additional Common III                                 | 4           | 5              |               |             |
|                                            | Central Themes in Indian Economy                      | 5           | 5              |               |             |
|                                            | International Economics                               | 4           | 4              |               |             |
|                                            | Complementary III                                     | 4           | 6              |               |             |
| <b>IV</b>                                  | Common English VI                                     | 4           | 5              | 20            | 25          |
|                                            | Additional Common IV                                  | 4           | 5              |               |             |
|                                            | Research Methods and Techniques for Economic Analysis | 4           | 5              |               |             |
|                                            | Environmental Economics                               | 4           | 4              |               |             |
|                                            | Complementary IV                                      | 4           | 6              |               |             |
| <b>V</b>                                   | Generic Elective Course                               | 2           | 2              | 22            | 25          |
|                                            | Basic Tools for Economic Analysis I                   | 4           | 6              |               |             |
|                                            | Heterodox Economics                                   | 4           | 4              |               |             |
|                                            | Macroeconomic Analysis I                              | 4           | 5              |               |             |
|                                            | Development Economics                                 | 4           | 4              |               |             |
| <b>VI</b>                                  | Economics of Banking and Finance                      | 4           | 4              | 18            | 25          |
|                                            | Basic Tools for Economic Analysis II                  | 4           | 6              |               |             |
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|                                            | Basic Econometric Analysis                            | 4           | 6              |               |             |
| Project                                    | 2                                                     | 3           |                |               |             |
| <b>Total</b>                               |                                                       |             |                | <b>120</b>    | <b>150</b>  |
| <b>Total Marks for Economics Programme</b> |                                                       | <b>1525</b> |                |               |             |

**PART A:**

**ECONOMICS CORE COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**(2019 ADMISSION ONWARDS)**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>                                   | <b>SEMESTR</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b>    | <b>MARKS (EXT+INT)</b> |
|--------------------|-------------------------------------------------------|----------------|-----------------------|---------------|--------------------|------------------------|
| 1 B 01ECO          | MICRO-ECONOMIC ANALYSIS I                             | I              | 6                     | 5             | 3                  | 40+10=50               |
| 2 B 02 ECO         | MICRO-ECONOMIC ANALYSIS II                            | II             | 6                     | 4             | 3                  | 40+10=50               |
| 3 B03 ECO          | CENTRAL THEMES IN INDIAN ECONOMY                      | III            | 5                     | 5             | 3                  | 40+10=50               |
| 3 B04 ECO          | INTERNATIONAL ECONOMICS                               | III            | 4                     | 4             | 3                  | 40+10=50               |
| 4 B05 ECO          | RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS | IV             | 5                     | 4             | 2+1*               | 30+10+10* =50          |
| 4B06 ECO           | ENVIRONMENTAL ECONOMICS                               | IV             | 4                     | 4             | 3                  | 40+10=50               |
| 5D 01ECO           | GENERIC ELECTIVE                                      | V              | 2                     | 2             | 2                  | 20+5=25                |
| 5 B07 ECO          | BASIC TOOLS FOR ECONOMIC ANALYSIS I                   | V              | 6                     | 4             | 3                  | 40+10=50               |
| 5 B08 ECO          | HETERODOX ECONOMICS                                   | V              | 4                     | 4             | 3                  | 40+10=50               |
| 5 B 09ECO          | MACROECONOMIC ANALYSIS I                              | V              | 5                     | 4             | 3                  | 40+10=50               |
| 5 B10 ECO          | DEVELOPEMNT ECONOMICS                                 | V              | 4                     | 4             | 3                  | 40+10=50               |
| 5 B11ECO           | ECONOMICS OF BANKING AND FINANCE                      | V              | 4                     | 4             | 3                  | 40+10=50               |
| 6 B12 ECO          | BASIC TOOLS FOR ECONOMIC ANALYSIS II                  | VI             | 6                     | 4             | 3                  | 40+10=50               |
| 6 B13 ECO          | MACROECONOMIC ANALYSIS II                             | VI             | 5                     | 4             | 3                  | 40+10=50               |
| 6 B14 ECO          | PUBLIC ECONOMICS                                      | VI             | 5                     | 4             | 3                  | 40+10=50               |
| 6 B15 ECO          | BASIC ECONOMETRIC ANALYSIS                            | VI             | 6                     | 4             | 3                  | 40+10=50               |
| 6 B16 ECO          | PROJECT**                                             | VI             | 3                     | 2             | PROJECT EVALUATION | **25+25=50             |
|                    | TOTAL                                                 |                |                       | 66            |                    | 825                    |

\*Computer practical

\*\* 25 marks each for Internal and External evaluation



**PART A:**

**DEVELOPMENT ECONOMICS CORE COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**(2019 ADMISSION ONWARDS)**

| <b>COURSE CODE</b>            | <b>COURSE TITLE</b>                                    | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b>         | <b>MARKS</b> |
|-------------------------------|--------------------------------------------------------|-----------------|-----------------------|---------------|-------------------------|--------------|
| 1 B 01<br>DEV ECO             | MICRO-ECONOMIC ANALYSIS I                              | I               | 6                     | 5             | 3                       | 40+10=50     |
| 2 B 02<br>DEV ECO             | MICRO-ECONOMIC ANALYSIS II                             | II              | 6                     | 4             | 3                       | 40+10=50     |
| 3 B03<br>DEV ECO              | THEORIES OF ECONOMIC DEVELOPEMNT                       | III             | 5                     | 5             | 3                       | 40+10=50     |
| 3 B04<br>DEVECO               | INTERNATIONAL ECONOMICS                                | III             | 4                     | 4             | 3                       | 40+10=50     |
| 4 B05<br>DEVECO               | RESEARCH METHODS AND TECHNIQUES FOR ECONOMICS ANALYSIS | IV              | 5                     | 4             | 2+1*                    | 30+10+10*=50 |
| 4B06<br>DEVECO                | ENVIRONMENTAL ECONOMICS                                | IV              | 4                     | 4             | 3                       | 40+10=50     |
| 5D 01<br>DEV ECO              | GENERIC ELECTIVE                                       | V               | 2                     | 2             | 2                       | 20+5=25      |
| 5 B07<br>DEV ECO              | BASIC TOOLS FOR ECONOMIC ANALYSIS I                    | V               | 6                     | 4             | 3                       | 40+10=50     |
| 5 B08<br>DEV ECO              | HETERODOX ECONOMICS                                    | V               | 4                     | 4             | 3                       | 40+10=50     |
| 5 B 09<br>DEVECO              | MACROECONOMIC ANALYSIS I                               | V               | 5                     | 4             | 3                       | 40+10=50     |
| 5 B10<br>DEV ECO              | DEVELOPMENT PLANNING: TOOLS AND TECHNIQUES             | V               | 4                     | 4             | 3                       | 40+10=50     |
| 5 B11<br>DEV ECO              | ECONOMICS OF BANKING AND FINANCE                       | V               | 4                     | 4             | 3                       | 40+10=50     |
| 6 B12<br>DEV ECO              | BASIC TOOLS FOR ECONOMIC ANALYSIS II                   | VI              | 6                     | 4             | 3                       | 40+10=50     |
| 6 B13<br>DEV ECO              | MACROECONOMIC ANALYSIS II                              | VI              | 5                     | 4             | 3                       | 40+10=50     |
| 6 B14<br>DEV ECO              | PUBLIC ECONOMICS                                       | VI              | 5                     | 4             | 3                       | 40+10=50     |
| 6 B15<br>DEV ECO              | BASIC ECONOMETRIC ANALYSIS                             | VI              | 6                     | 4             | 3                       | 40+10=50     |
| 6 B16<br>DEV ECO<br>(PROJECT) | PROJECT**                                              | VI              | 3                     | 2             | PROJECT EVALU-<br>ATION | **25+25=50   |
|                               | TOTAL                                                  |                 |                       | 66            |                         | 825          |

\*Computer practical

\*\* 25 marks each for Internal and External evaluation

## EVALUATION

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> |
|-------------------|------------------|
| EXTERNAL          | 4                |
| INTERNAL          | 1                |

## CONTINUOUS INTERNAL ASSESSMENT

| <b>COMPONENT*</b>                     | <b>WEIGHTAGE**</b> | <b>REMARKS</b> |
|---------------------------------------|--------------------|----------------|
| COMPONENT1<br>EXAM                    | 50%                |                |
| COMPONENT 2<br>ASSIGNMENT/<br>SEMINAR | 50%                |                |

\*Any two components, Attendance shall not be a component

**PART A:**  
**ECONOMICS/DEVELOPMENT ECONOMICS:**  
**COMPLEMENTARY ELECTIVE COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**(2019 ADMISSION ONWARDS)**

| SL NO. | COURSE CODE            | COURSE TITLE                                                           | SEMESTER | HOURS PER WEEK | CREDIT | EXAM HRS | MARKS    |
|--------|------------------------|------------------------------------------------------------------------|----------|----------------|--------|----------|----------|
| 1      | 1 C 01ECO/<br>DEV ECO  | MATHEMATICS FOR<br>ECONOMIC ANALYSIS I                                 | I        | 6              | 4      | 3        | 40+10=50 |
| 2      | 2 C 02 ECO/<br>DEV ECO | MATHEMATICS FOR<br>ECONOMIC ANALYSIS II                                | II       | 6              | 4      | 3        | 40+10=50 |
| 3      | 3 C03 ECO/<br>DEV ECO  | MATHEMATICAL<br>ECONOMICS I                                            | III      | 6              | 4      | 3        | 40+10=50 |
| 4      | 4 C04 ECO/<br>DEV ECO  | MATHEMATICAL<br>ECONOMICS II                                           | IV       | 6              | 4      | 3        | 40+10=50 |
| 5      | 1 C05 ECO              | INTRODUCTORY<br>ECONOMICS I<br>(FOR NON-ECONOMICS<br>PROGRAMMES ONLY)  | I        | 6              | 4      | 3        | 40+10=50 |
| 6      | 2 C06 ECO              | INTRODUCTORY<br>ECONOMICS II<br>(FOR NON-ECONOMICS<br>PROGRAMMES ONLY) | II       | 6              | 4      | 3        | 40+10=50 |
| 7      | 3 C07 ECO              | HISTORY OF ECONOMIC<br>THOUGHT I                                       | III      | 6              | 4      | 3        | 40+10=50 |
| 8      | 4 C08 ECO              | HISTORY OF ECONOMIC<br>THOUGHT II                                      | IV       | 6              | 4      | 3        | 40+10=50 |
| 9      | 1 C 09ECO              | POPULATION AND<br>DEVELOPMENT                                          | I        | 6              | 4      | 3        | 40+10=50 |
| 10     | 2 C10 ECO              | ECONOMIC GEOGRAPHY                                                     | II       | 6              | 4      | 3        | 40+10=50 |
| 11     | 3 C11ECO               | AGRICULTURAL<br>ECONOMICS                                              | III      | 6              | 4      | 3        | 40+10=50 |
| 12     | 4 C12 ECO              | GENDER ECONOMICS                                                       | IV       | 6              | 4      | 3        | 40+10=50 |

**ECONOMICS/DEVELOPMENT ECONOMICS:**  
**LIST OF GENERIC ELECTIVE COURSES (ANY ONE OUT OF FIVE)**  
**WORK AND CREDIT DISTRIBUTION**

| <b>COURSE CODE</b>         | <b>COURSE TITLE</b>                      | <b>SEMESTER</b> | <b>HOURS/ WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> | <b>MARKS (EXT+INT)</b> |
|----------------------------|------------------------------------------|-----------------|--------------------|---------------|-------------------|------------------------|
| <b>5 D 01 ECO/ DEV ECO</b> | BASICS OF ECONOMICS                      | <b>V</b>        | 2                  | 2             | 2                 | 20+5=25                |
| <b>5 D 02 ECO/ DEV ECO</b> | DEVELOPMENT ISSUES OF INDIAN ECONOMY     | <b>V</b>        | 2                  | 2             | 2                 | 20+5=25                |
| <b>5 D 03 ECO/ DEV ECO</b> | KERELA ECONOMY                           | <b>V</b>        | 2                  | 2             | 2                 | 20+5=25                |
| <b>5 D 04 ECO/ DEV ECO</b> | FUNDAMENTALS OF BUDGET                   | <b>V</b>        | 2                  | 2             | 2                 | 20+5=25                |
| <b>5 D 05 ECO/ DEV ECO</b> | INDIAN ECONOMY IN THE POST-REFORM PERIOD | <b>V</b>        | 2                  | 2             | 2                 | 20+5=25                |

## CORE COURSE I: MICROECONOMIC ANALYSIS I

| SEMESTER | COURSE CODE          | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|----------------------|----------------|--------|----------|
| I        | 1B01 ECO/<br>DEV ECO | 6              | 5      | 3        |

### COURSE OUTCOME

*The Course Outcomes are the knowledge and skills the student acquire at the end of a course.*

1. A strong theoretical and empirical foundation in economics which produces employable graduates and has scope for a variety of opportunities for higher education in economics and related disciplines.
2. Students familiarity about the tool box of micro economics will enhance the capacity for understanding the functioning of economies.
3. A thorough knowledge and theoretical understanding of the foundations of modern economic analysis

#### **Module I Introduction to Micro Economics**

Scope and Subject Matter of Microeconomics, Difference between micro and macro economics- Use and limitations of micro economics- Economic model- uses, application and limitations. Scarcity and choice-PPC (15 hrs)

#### **Module II Demand and Supply Analysis**

Demand function- Law of demand- Reasons for the downward slope of the demand curve - Exceptions to the law of demand- Change in demand and change in quantity demanded- Elasticity of demand- Types-price elasticity- Income elasticity- Cross elasticity-advertising elasticity - factors affecting price elasticity - methods of measurement of elasticity - Supply- determinants- Law of supply- Changes in supply- Elasticity of supply. Concepts of equilibrium (static, dynamic, comparative static, stable, unstable, neutral, partial, general) Market Equilibrium — Price Ceilings and Price Floors (25 hrs).

#### **Module III Theory of consumer behavior**

Water diamond paradox -Cardinal approach( Marshallian)-Assumptions, Law of diminishing marginal utility, Law of equi- marginal utility – solution to water diamond paradox – Ordinal approach- Assumptions-Indifference curve and its properties-consumer equilibrium by using indifference curve analysis- Price effect, Income and substitution effects -splitting (decomposition) price effect into income and substitution effects: (Hicks and Slutsky)- Effect of change in price and income on consumer equilibrium(Price consumption curve and Income consumption curve)-Engel curve- Consumer surplus Cardinal and Ordinal measurement- Behaviorist approach - Revealed

preference theorem of Samuelson – distinction between weak and strong ordering. Hicks' logical ordering (38 hrs).

#### **Module IV Production and cost**

Production function—short run (law of variable proportion) and long run (returns to scale) production function -Economies and diseconomies of scale - Iso-quants and Iso-cost analysis—Least cost input combination (Producer's equilibrium) - Expansion path – Theory of cost-Traditional and modern- Linear programming (Graphical method) (30 hrs)

#### **Books for Study**

1. Dwivedi, D. N. (2002) Microeconomics: Theory and Applications. Pearson Education India.
2. Varian, H. R. (2014) Intermediate Microeconomics with Calculus: A Modern Approach, WW Norton & Company.
3. Mankiw, N. G. (2002) Microeconomics, Worth Publishers
4. Pindyck, R. S., Rubinfeld, D. L and Prem L.Mehta (2013). Microeconomics. Boston: Pearson.

#### **Books for Reference**

1. Salvatore, D. (2008) Microeconomics: Theory and Applications. OUP.
2. Koutsoyiannis, A. (1975) Modern Microeconomics. Macmillan.
3. Mas-Colell, A., Whinston, M. D., & Green, J. R. (1995) Microeconomic theory (Vol. 1). New York: OUP.

## CORE COURSE II: MICROECONOMIC ANALYSYS II

| SEMESTER | COURSE CODE          | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|----------------------|----------------|--------|----------|
| II       | 2B02 ECO/<br>DEV ECO | 6              | 4      | 3        |

### COURSE OUTCOME

1. Students may acquire confidence to apply the principles of micro economics to the decision making of firms and the functioning of the market.
2. Students will also be able to analyze the distributional dynamics of the economy both at the micro and the macro level

#### **Module I Perfect competition**

Market structures –classification of markets– revenue concepts -perfect competition - characteristics – firm & industry – short run and long run equilibrium of a firm and industry – shutdown point. Perfect competition and Pareto optimality (20 hrs).

#### **Module II Monopoly**

Monopoly and its features- types of monopoly –short run and long run equilibrium - price discrimination - Types- degrees of price discrimination-regulation of monopoly– Monopsony– bilateral monopoly- indeterminacy under bilateral monopoly (24 hrs).

#### **Module III Monopolistic Competition and Oligopoly**

Monopolistic competition – Features-firm and product group-non-price competition and selling costs - short run and long run equilibrium-group equilibrium- excess capacity –Oligopoly – Features of oligopoly – collusive, non- collusive and price leadership- kinked demand curve (Sweezy’s model)- Duopoly –Cournot’s model – Bertrand’s model – Chamberline’s small group model (32 hrs)

#### **Module IV Factor Pricing and Economic Welfare**

Distribution: Functional versus personal distribution - Demand for and supply of factors - concepts of total physical product (TPP) APP – VMP – MRP – marginal productivity theory of distribution – Product exhaustion theorem. Factor pricing under perfect competition and imperfect competition. Rent and Quasi rent-Ricardian theory of rent- Modern theory of rent-Theories of wages (subsistence, wage fund) Theories of interest (classical, neo classical and Keynesian) Theories of profit (dynamic, risk bearing, innovation and uncertainty). Economic welfare- criteria of welfare (GNP, Bentham, cardinal, Pareto, compensation, Bergson- Samuelson) (32 hrs)

#### **Books for Study**

1. Salvatore, D. (2008). Microeconomics: Theory and Applications. OUP.
2. Koutsoyiannis. A (1975). Modern Microeconomics. macmillan.

3. Pindyck, R. S., & Rubinfeld, D. L. (2013). *Microeconomics*. Boston: Pearson. .
4. Schaum's Series (2004) *Outline of Microeconomics*, McGraw Hills.
5. Varian, H. R. (2014). *Intermediate Microeconomics with Calculus: A Modern Approach*. WW Norton & Company
6. Mankiw, N. G. (2010). *Microeconomics*, Worth Publishers

**Books for reference**

1. Dwivedi, D. N. (2002). *Microeconomics: Theory and Applications*. Pearson Education
2. Varian, H. R. (1977). *Intermediate Microeconomics, Workbook Solution Manual*



**CORE COURSE III: CENTRAL THEMES IN INDIAN ECONOMY**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>III</b>      | <b>3B03 ECO</b>    | <b>5</b>                  | <b>5</b>      | <b>3</b>            |

**COURSE OUTCOME**

1. To help the students to identify the basic structure and working of Indian economy by enabling them to use qualitative and quantitative data relating to various economic issues and policies.
2. Students may get an opportunity to identify the strategic drivers in the development of Indian Economy.
3. It will create an environment to comprehend and critically appraise the current problems and policies relating to Indian economy.

**Module I- India in the Global Scenario**

Basic features of Indian Economy- Structural Changes in Indian Economy- A critical evaluation of Five Year Planning in India- NITI Ayog: Structure, Objectives and functions- Economic Reforms: Liberalisation, Privatization, Globalisation and its impacts- India as an Emerging Economic Power. Demonetization and its impact on Indian economy. (20 hours)

**Module II -Role of Agriculture, Industry and Service Sector**

Role of agriculture: contribution to GDP, employment and international trade- Problems of Indian Agriculture- Causes of low productivity- New Agricultural Strategy: Green Revolution, Evergreen Revolution - WTO and Indian Agriculture. Role of industries in the Economic development of India- Problems of Public sector enterprises – Problems of Small Scale and Cottage Industries- New Industrial Policy 1991: its impact on Industrial Development in India. Role of Service Sector in the Indian Economy- Recent trends in India's Foreign Trade. (35 hours)

**Module- III -Emerging Development Issues**

Poverty- Meaning, concepts and types - Extent of poverty in India- Poverty Eradication Programmes.

Unemployment- Meaning, concepts, types and causes of unemployment- Work Participation Rate- Magnitude of Unemployment in India. Inequality; Meaning and types- Regional inequality; Causes and remedies. (15 hours)

**Module IV -Kerala Economy**

Unique Features of Kerala Economy- Demographic indicators- Agricultural Stagnation- Industrial Backwardness- Current issues in education, health and energy sectors- Decentralized Planning- Migration and Foreign Remittance- Problem of Aging- Women Empowerment. (20 hours)

### **Books for Study**

1. Misra, S. K., & Puri, V. K. (2011). Indian Economy, Himalaya Publishing House.
2. Dutt, R., & Sundaram, K. P. M. (2008). Indian Economy, S Chand New Delhi.
3. Agrawal, A. N. (2015). Indian Economy. New Age International Pvt.
4. Kapila, U. (2009). Indian Economy: Performance and Policies. Academic Foundation.
5. Kapila, U. (Ed.). (2017). Demonetization: The Economists Speak. Academic Foundation.
6. Jalan, B. (2004). Indian Economy. Penguin UK.
7. Ashokan, A.(2009) Perspectives of Health Economics, Serials Publication New Delhi

### **Books for Reference**

1. Thirlwall, A. P. (1994). Growth and Development: With Special Reference To Developing: with Special Reference to Developing Economies. Macmillan International Higher Education.
2. Joshi, V, Little, I. M. D., & Little, I. M. D. (1996). India's Economic Reforms, 1991-2001. OUP.
3. Ishwar, D. C. (2010). Indian Economy–Environment and Policy.
4. Desai. B, (2008) Industrial Economy in India, Himalaya Publishing House, Mumbai.
5. Parayil, G., & Sreekumar, T. T. (2003). Kerala's Experience of Development and Change. Journal of Contemporary Asia, 33(4), 465-492.
6. Franke, R. W. (2001). Local Democracy and Development: People's Campaign for Decentralized Planning in Kerala. Leftword.
7. R.K Lekhi & Joginder Singh (2010) Agricultural Economics, Kalyan Publishers. New Delhi.
8. Oommen, M. A. (1993). Essays on Kerala economy. Oxford & IBH Publishing Company.
9. Rangarajan, C., & Kannan, R. (2004). Select Essays on Indian economy (Vol.1). Academic Foundation.
10. Kapila, U. (Ed.). (2009). Indian Economy Since independence. Academic Foundation.
11. Dutt, R., & Sundaram, K. P. M. (2008) Indian Economy, S Chand,New Delhi.

12. Basu, K. (Ed.). (2004). *India's Emerging Economy: Performance and Prospects in the 1990s and Beyond*. MIT press.
13. Prakash, B. A. (Ed.). (2012). *The Indian Economy Since 1991: Economic Reforms and Performance*, 2/e. Pearson Education India.
14. Jalan, B. (2012). *Emerging India: Economics, Politics, and Reforms*. Penguin
15. Jalan, B. (2004). *Indian Economy*. Penguin UK.
16. Jeffrey, R. (2016). *Politics, Women and Well-being: How Kerala became a model*. Springer.
17. George, K. K. (1999). *Limits to Kerala Model of Development: An analysis of fiscal crisis and its implications*. Centre for Development Studies. Thiruvananthapuram

**DEVELOPMENT ECONOMICS CORE COURSE III:**

**THEORIES OF ECONOMIC DEVELOPMENT**

| SEMESTER | COURSE CODE  | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|--------------|----------------|--------|----------|
| III      | 3B03 DEV ECO | 5              | 5      | 3        |

**Course outcomes**

1. To know the determinants and measurement issues relating to growth and development
2. To enable students to understand the theories and strategies of growth and development
3. To provide basic understanding about the developmental challenges faced by LDCs
4. To provide a general outlook on various policy issues in development.

**Module I: Introduction to Development Economics**

Defining the concepts of Economic growth and Economic development , Structure and characteristics of developing nations, Vicious circle of poverty both on demand and supply side-Basic requirement of development - Measures of economic growth-Gross Domestic product, Per capita income concepts –limitations .Measures of economic development- Human Development index and other indices of development (PQLI, GDI, HPI, MPI, GEM, Green Index, Global Hunger Index, Global happiness index etc), Recent trends in human development indices , Core values of development (Denis Goulet), Amrithya Sen’s capability approach. Development gap.

(17 Hours)

**Module II: Determinants of development:**

The role of capital in development: Sources of capital, Capital formation, capital –output ratio, Natural capital: supply of land and other natural resources, Human capital: Education and health indicators , Human capital formation and manpower planning, Technological progress and development, Capital intensive and labour intensive, intermediate technology, Growth of population and development, Theory of demographic transition, Role of institutions in development, Basic concepts in gender and development-sex and gender-Women in Development(WID) and Women and development(WAD)

(20 hours)

**Module III: Theories of Growth and development.**

Theories of Adam Smith, David Ricardo and Malthus, Marx’s stages of Growth and Marxian theory of economic development-Schumpeter’s theory-Rostow’s stages theory, Big push theory, Critical minimum effort theory, Nelsons low level equilibrium trap theory, Lewi’s model of unlimited supply of labour, Disguised unemployment as a saving potential-Theories of Nurkse, Vakil and Brahmananda, Balanced and Unbalanced growth theories, Harrod –Domar and Solow swan Growth models

(35 hours)

#### **Module IV: Policies for Development**

Role of monetary and Fiscal policies in economic development, inward and outward oriented foreign trade policies and its impact on development. Role of industrial and agricultural policies on development, Role of foreign aid and foreign capital on economic development.

(18)

#### **Books for study**

1. A P Thirlwall,(2006) *Growth and Development, with Special Reference to Developing Countries*, Palgrave Macmillan,
2. A N Agarwal and S P Singh (1958), *The Economics of Underdevelopment*, OUP
3. Misra and Puri(2007): *Economics of Development and Planning –Theory and Practice*, Himalaya Publishing House, New Delhi
4. Todaro, Michael, P (1993); *Economic Development in the Third World*, Orient Longman, Hyderabad.

#### **Books for References**

1. Meir, Gerald, M (1990) *Leading Issues in Economic Development –OUP Delhi*.
2. Adelman Irma (1962): *Theories of Economic Growth and Development*, Stanford University Press, California.
3. Sen, Amartya (1982) *Poverty and Famines*, OUP.
4. Nurkse, Ragnar(1957) *Problems of Capital formation in Under Developed Countries*, Monthly Review Press, Newyork
5. Agarwal, R.C (2004) *Economics of Development and Planning –Theory and Practice*, Lakshmi Narain Agarwal Educational Publishers, Agra
6. Utsa Patnaik, *Trends in urban poverty under economic reforms: 1993-94 to 2004-05*, EPW, Vol-XLV No.4, January 23, 2010.
7. Kaushik Gangopadhyay and Kamal Singh, *Extent of poverty in India A different Dimension*,EPW Vol-XLVIII No.06, February 09, 2013
8. Radhicka Kapoor, *Inequality matters*, EPW Vol-XLVIII No. 02, January 12, 2013
9. Himanshu, *Towards new poverty lines for India*, EPW, Vol-XLV, No.01, January 02, 2010
10. UNDP Reports

### CORE COURSE IV: INTERNATIONAL ECONOMICS

| SEMESTER | COURSE CODE          | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|----------------------|----------------|--------|----------|
| III      | 3B04 ECO/<br>DEV ECO | 4              | 4      | 3        |

#### COURSE OUTCOME

1. Enabling the students to assess current international economic issues based on theory and evidence.
2. Preparing the students to undertake higher studies and research in issues related to International Economics
3. Students may get an opportunity to examine the trends in global economic performance

**MODULE I:** Introduction to International Economics – Meaning, nature and contents of International economics. Importance of the study of International economics, International and Inter regional trade, tools in trade theory- indifference Curve, Production Possibility Curve- community Indifference Curve. Theories of absolute advantage, Comparative advantage, Opportunity cost theory, Reciprocal demand theory, Heckscher - Ohlin theory – criticisms. Empirical tests of trade models- Leontief Paradox (18 hours)

**MODULE II.** Terms of Trade – Terms of trade and its importance, classification of TOT, Commercial policy – Free trade vs protection- Methods of trade restrictions – Tariff barriers and non tariff barriers – Types of tariff, effect of tariff, methods of non tariff barriers – Quotas , Export subsidies, Voluntary Exchange restraints, International cartels, Dumping, technical, administrative and other measures. WTO and Free trade agreements (19hours)

**MODULE III.** Foreign Exchange – Foreign exchange market and its structures. The foreign exchange rate fixed and flexible, exchange rate regime in India, theories of exchange rate Termination , the Mint Parity theory, the Purchasing Power Parity theory, Demand and supply analysis (17 hours)

**MODULE IV.** Balance of Trade and Balance of Payments –Meaning and definition, structure of BOP- Current account and Capital account- balance of payment equilibrium and disequilibrium- Causes of disequilibrium – corrective measures- automatic and deliberate measures. The Brettonwoods system and IMF – Role of IMF to address the BOP disequilibrium – India’s BOP since 1991 (18 hours)

#### **Books for Study**

1. Feenstra, R. C., & Taylor, A. M. (2010). *Essentials of International Economics*. Macmillan.
2. Obstfeld, M., & Krugman, P. R. (2003). *International Economics: Theory and Policy*. Addison-Wesley/Pearson.

3. Appleyard, D. R., Field Jr, A. J., Cobb, S. L., & Lima, A. F. (2010). *International Economics*, McGraw Hill.

**Books for Reference**

1. Salvatore, D(2009) *International Economics* , OUP
2. Miltiades Chacholiades(2012) *International Economics*, McGraw-Hill
3. Sodersten, B., & Reed, G. (1980). *International Economics*, St. *Martin's Press, New York*.
4. Henry Thompson (2010) *International Economics, Global Markets and Competition*, Cambridge University Press India Pvt Ltd
5. Thomas Pugel (2010) *International Economics*, McGraw-Hill
6. Vaish, M. C., & Singh, S(1990) *International Economics*, Oxford, IBH

**CORE COURSE V**  
**RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS**

| <b>SEMESTER</b> | <b>COURSE CODE</b>            | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|-------------------------------|---------------------------|---------------|---------------------|
| <b>IV</b>       | <b>4B 05 ECO/<br/>DEV ECO</b> | <b>5</b>                  | <b>4</b>      | <b>2+1*</b>         |

\*computer practical

**COURSE OUTCOME**

1. To initiate students to the field of academic research.
2. Introduce quantitative, qualitative and analytical tools required to prepare small research projects.
3. To bridge the gap between theory and empirics and to familiarize the use and importance of data in research
4. To highlight the importance of scientific research in economics based on academic honesty, integrity and ethics

**Module I:**

Introduction: Importance of academic research in Economics. Positive science and Normative- deductive and inductive methods -Problems of Research in Social Sciences: Quantification, Organizing Controlled Experiments, Replication and Verification; Criteria of Good Research. Research Methods: Social Survey, Case Study, Experimental Method, Econometric Method. (Definition, Features, Importance and Limitations) (23 hours)

**Module II:**

Basics of Research in Economics –Significance of Theory and Hypothesis. The research Design: Steps in Research Process & Structure of Research Report-Identification of research problem- review of literature- framing research questions-hypothesis formation. (18 hours)

**Module III:**

Academic Report Writing: Preparation of Synopsis; Explaining the Research Problem and Preparation of Bibliography; Notations and Symbols; Techniques for Referencing; importance of footnotes, bibliography and references, Preparation of Articles for Journals; Books; Preparation of Abstracts.

Ethics in research: Scientific integrity, Plagiarism (definition of plagiarism- consequences of plagiarism- unintentional plagiarism- forms of plagiarism), Good reference practice, Verification and subsequent use of research material. (22 hours)

**Module IV**



Empirical Investigations: Sources of Primary and Secondary Data; Census and Sampling Methods; Economic Statistics in India. Major Sources of data.NAS and NSSO -Data structure, key concepts and variables- Data portal of RBI (12hours)

**Written examination will be based on first *four* modules only. (30 marks) Practical examination based on fifth module for 10 marks**

### **PRACTICAL**

This introduces the student to the process extraction, analysis and presentation of data towards drawing statistical inferences. The students will be introduced to important data sources that are available in India and will be trained in the use of free statistical software to analyse data.

#### **Module V:**

Elementary calculations: Measures of central tendency and dispersion: Forms of presentation of data: trend line, charts and graphs. Growth rates; Method of Splicing and Deflating Series. Modes of referencing. Specific Styles- APA and MLA (students are encouraged to use free software packages) (15 hrs)

#### **Books for Study**

1. Ranjith Kumar (2014): Research Methodology: A Step-by- Step Guide for Beginners, Sage.
2. Goode, William J. and Hatt, P.K(1980) Methods in Social Research, McGraw Hill, New Delhi
3. Uwe Flick (2012): Introducing Research Methodology: A Beginner's Guide to Doing a Research Project, Sage.
4. Ross, R. (1974): Research: An Introduction, Barnes & Noble Books, New York.
5. Kothari, C. R., and Garg, G. (2019). Research Methodology: Methods and Techniques.

#### **Books for Reference**

1. Kurien, C. T, (ed.1973) A Guide to Research in Economics. Sangam Publishers for Madras Institute of Development Studies, Madras
2. CORE THE ECONOMY : Economics for A Changing World, Available at:  
<http://www.core-econ.org/>
3. National committees for research Ethics in Norway, Guidelines for Research Ethics in the Social Sciences, Law and the Humanities, 2006
4. MLA Handbook for writers of Research Papers, East-West Press Pvt .ltd, New Delhi, 2009.
5. Informatics Technology in action, Pearson, Dorling Kindersley, 2011
6. Gilbert, Norma (1981): Statistics, Holt-Saunders, Japan
7. Bernard (1966): Statistics in Research, Oxford & IBH, Mumbai.

**CORE COURSE VI: ENVIRONMENTAL ECONOMICS**

| <b>SEMESTER</b> | <b>COURSE CODE</b>           | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|------------------------------|-----------------------|---------------|-----------------|
| <b>IV</b>       | <b>4B06 ECO/<br/>DEV ECO</b> | <b>4</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOME**

1. To provide a deeper understanding about the interface between ecology and economy.
2. Understand the economic incentives to improve and conserve the environment.
3. To provide basic conceptual understanding of environmental disaster, its management and mitigation
4. Ultimately, greater awareness will be imparted about the issues of environmentally sustainable development in an interdisciplinary perspective.

**Module I: Introduction to Environmental Economics**

Meaning, need, nature and scope of environmental economics –Environment and Ecology- Environment and Economy interaction: Material Balance Model-the laws of thermodynamics– Environment and Ethics: Approaches – Bio centric and Anthropocentric **(13 hours)**

**Module II: Natural Resources and Sustainable Development**

Renewable and exhaustible resources- Resource taxonomy – Sustainable development: meaning, weak and strong sustainability, approaches and indicators, threats to sustainable development – Issues of natural resources related to forest resource, water resources, energy resources, food resources and land resources – Need for conservation of natural resources **(17 hours)**

**Module III Market Failure and Externalities**

Public Good: Meaning and features – Environmental quality as a public good – Externalities: Positive and Negative externalities – Market failure in the presence of externalities – free rider problem – Common Property Resources – Tragedy of Commons: Coase theorem and Property Rights – Abatement of externalities: Emission Standards, Pigouvian tax and Subsidies**(20 hours)**

**Module IV Climate Change, Pollution and Disaster Management**

Climate Change and its impact: Green house effect and Global Warming, Acid Rain, Ozone layer Depletion, Loss of Bio diversity and Desertification –

- i) Types of Pollutions: Air, Water, Noise, Soil, Marine, Thermal, Nuclear pollution, Solid Waste and E-waste – Major Environmental issues in Kerala: consumerism and waste products, land sliding, sand mining and laterite stone mining. – Environmental awareness movements in India (Silent Valley and Narmada Bachao movements) –

- ii) Disaster Management: concepts of hazard, risk, vulnerability and disaster, types and classification of disasters, importance and relevance of disaster management in the present environmental scenario (22 hours)

**Note: compulsory field visit to various eco spots/ecologically sensitive places NOT MORE THAN 5 days. Report of field visit may be considered as assignment of this paper.**

**Books /Reports for Study:**

1. Kolstad, C. (2011). Intermediate Environmental Economics: International Edition. OUP
2. Callan, S. J., & Thomas, J. M. (2013). Environmental Economics and Management: Theory, Policy, and Applications. Cengage Learning.
3. Rabindra N. Battacharya, (2008) Environmental Economics: An Indian Perspective, OUP
4. Barry C Field,( 2012) Natural Resource Economics: An Introduction, Waveland Press, Inc
5. Subhashini Muthukrishnan, (2015) Economics of Environment, PHI Private Limited, Delhi
6. On disaster management, visit at:
  - i).<https://ndma.gov.in/images/policyplan/dmpln/National%20Disaster%20Management%20Plan%20May%202016.pdf>; Web: [www.ndma.gov.in](http://www.ndma.gov.in)
  - ii) Chaminda Pathirage, Krisanthi Seneviratne, Dilanthi Amaratunga and Richard Haigh (2014) Knowledge factors and associated challenges for successful disaster knowledge sharing, Global Assessment Report on Disaster Risk Reduction, Centre for Disaster Resilience, University of Salford.

**Books for Reference**

1. Tom Tietenberg (2004) Environmental and Natural Resource Economics, Pearson
2. Vinod K. Sharma (1999) Disaster Management. National Centre for Disaster Management, IPE, New Delhi
3. Nick Hanley, Jason F Shogren & Ben White (1997), Environment Economics: Theory and Practice. Macmillan India Ltd
4. Singh Katar and Shishodia A (2007) Environmental Economics, Theory and Applications, Sage Publication.
5. John Asafu-Adjaye (2005) Environmental Economics for Non-economists: Techniques and Policies for Sustainable Development. World Scientific Publishing Pvt. Co.
6. Barry C Field and Martha K Field (2010), Environmental Economics-An Introduction, McGraw Hill.

**CORE COURSE VII:  
BASIC TOOLS FOR ECONOMIC ANALYSIS I**

| SEMESTER | COURSE CODE           | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-----------------------|----------------|--------|----------|
| V        | 5 B0 7ECO/<br>DEV ECO | 6              | 4      | 3        |

**COURSE OUTCOME**

1. To enable the students to understand economic concepts with the aid of mathematical and Statistical tools.
2. To equip the students to quantify economic variables and to enable them to apply statistical techniques in Economics.
3. To analyze and interpret empirical data with the help of statistical tools

**Module I: Elementary Mathematics**

Number system, laws of indices, logarithm, arithmetic and geometric progressions, compound growth rate. Equations: linear and quadratic equations and their solution. Applications in economics – market equilibrium (28 hours).

**Module 2: Elementary Set theory and economic functions:** Set theory: Concept, types, operations, Cartesian product-Functional relations and functions-graphs- application in economics. Cost, revenue, total product, average cost, demand and supply curves, PPC Curve –indifference curve –isoquant. (24 hours).

**Module 3: Introduction to Statistics:** Meaning, definition of statistics- role of statistics in economics-Collection of data: types of Data – Census and Sampling-Types of sampling. Classification of data-tabulation. Presentation of data: Histograms, polygon, frequency curves, bar and pie diagrams. Analysis and interpretation of data: Measures of central value: Mean, Median, Mode, Geometric Mean and Harmonic Mean-partition values-Measures of Dispersion: Range, Quartile deviation, Mean deviation and Standard Deviation-Lorenz Curve and Gini Coefficient and its economic application- Skewness and Kurtosis (40 hours).

**Module 4: Basic Probability:** Meaning and approaches, definition of probability, addition theorem, conditional probability, independence of events and multiplication theorem (Simple examples) (16 hours)

**Books for Study**

1. Allen, R.G.D. (1980) Mathematical Analysis for Economists, Palgrave MacMillan.
2. Monga G.S. (2007), Mathematics and Statistics for Economists, Vikas Publishing House, New Delhi.
3. Mehta and Madnani(2000), Mathematics for Economists, Sultan Chand & Sons, New Delhi
4. Gupta S.P(1996): Statistical Methods, Sultan Chand& Sons, New Delhi

5. S. C. Gupta (1999) Fundamentals of Statistics, Himalaya Publishing House, Delhi.

**Books for Reference**

1. Veerachamy R. (2005), Quantitative Methods for Economics, New Age International (P) Limited Publishers, New Delhi.
2. Dowling, E.T (2006): Introduction to Mathematical Economics, Schaum's Online Series, McGraw Hill, New Delhi.
3. Chiang, A.C (2005): Fundamental Methods of Mathematical Economics, McGraw Hill.
4. Taro Yamane (1996): Mathematics for Economists: An Elementary Survey, Prentice Hall.
5. Agarwal, D.R (1995): Mathematics for Economics, Vrinda Publications, Delhi.
6. Yule and Kendall (1984): An Introduction to the Theory of Statistics, Charles Gtiffin & Co, London.
7. Spiegel, M.R (2000): Theory and Problem of Statistics, McGraw Hill, London.

**CORE COURSE VIII:  
HETERODOX ECONOMICS**

| SEMESTER | COURSE CODE          | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|----------------------|----------------|--------|----------|
| V        | 5 B08ECO/<br>DEV ECO | 4              | 4      | 3        |

**Course Outcome**

1. Familiarity with different perspectives of alternative schools of thought may get easily exposed to pluralistic approach to both economic theory and policy.
2. Through such an exposure the course will enhance and diversify the knowledge profile of the students and may get opportunities to pursue higher studies and research in heterodox economics.

**Module 1 Features and Limitations of Mainstream Economics**

Features of Mainstream or Orthodox Economics – rationality – optimizing behaviour of economic agents - existence of equilibrium- central role of market- Critique of Mainstream Economics – imperfect information- market failure- role of government- role of institutions (15 hrs)

**Module 2 An Introduction to Heterodox Economics**

Definition, Nature and Scope Principles and teaching of Heterodox Economics –Brief history of heterodox economics

(10 hrs)

**Module 3 Foundations of Heterodox Economics: Marx and Veblen**

Economic ideas of Marx – Dialectical Materialism-Modes of production- historical evolution of human society- labour theory of value- accumulation of capital- immiserization of proletariat- Concentration and centralisation of capital-decline in profit and crises of capitalism- current relevance of Marxism-Marx as a heterodox economist.

Veblen’s Old Institutionalism- evolution and role of institutions-conspicuous consumption and leisure class- role of business enterprises- similarities of ideas between Veblen and Marx (28 hrs)

**Module 4 New Developments in Heterodox Economics**

- i) Institutionalism-Keynesian revolution-Schumpeter’s economic ideas- behavioural economics - feminist economics - ecological economics – neuro-economics (brief descriptions only)

- ii) Evolution of Heterodox Economic ideas in India- Gandhian economics (19 hrs).

**Books for study**

1. Mearman, A., Berger, S., & Guizzo, D. (2019). *What is Heterodox Economics?: Conversations with Leading Economists*. Routledge.
2. Slaughter, C. (1985). *Marx and Marxism*, Orient Longman.
3. Ashokan.A (2019) *An Introduction to Heterodox Economics*(forthcoming)

4. Lee, F. (2009). *A History of Heterodox Economics: Challenging the Mainstream in the Twentieth Century*. Routledge.
5. Albelda, R (2016). *Alternatives to Economic Orthodoxy: Reader in Political Economy*: Routledge.
6. Sweezy, P. M. (1970). *Theory of Capitalist Development*. Monthly Review Press.
7. Jo, T. H., & Lee, F. (Eds.). (2015). *Marx, Veblen, and the Foundations of Heterodox Economics: Essays in Honor of John F. Henry*. Routledge.

#### **Books/Reports for Reference**

1. Jo, T. H., Chester, L., & D'Ippoliti, C. (Eds.). (2017). *The Routledge Handbook of Heterodox Economics*. London: Routledge.
2. Barker, D., & Kuiper, E. (2003). *Toward a Feminist Philosophy of Economics*. Routledge.
3. Power, M. (2012). A History of Heterodox Economics. *On the Horizon* ,Vol. 20 Issue: 3, pp.253-259, <https://doi.org/10.1108/10748121211256847>
4. Samuels, W. (Ed.). (2002). *The Founding of Institutional Economics*. Routledge.
5. CORE THE ECONOMY : Economics for A Changing World, Available at: <http://www.core-econ.org/>
6. Heilbroner, R. L. (2011). *The Worldly Philosophers: The Lives, Times and Ideas of the Great Economic Thinkers*. Simon and Schuster.
7. Fischer, L., Hasell, J., Proctor, J. C., Uwakwe, D., Perkins, Z. W., & Watson, C. (Eds.2017). *Rethinking Economics: An Introduction to Pluralist Economics*. Routledge.

**CORE COURSE IX**  
**MACROECONOMIC ANALYSIS -I-**

| SEMESTER | COURSE CODE          | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|----------------------|----------------|--------|----------|
| V        | 5B09 ECO/<br>DEV ECO | 5              | 4      | 3        |

**COURSE OUTCOME**

1. Students will be able to get a perspective on the working of an economy.
2. By sharpening the macroeconomic tool box students will be able to appreciate macroeconomic policies.
3. Enables the students to pursue higher studies in the core domain of economics.

**Module I:** Definition of Macroeconomics – Evolution of Macroeconomics (Classical, Keynesian and Post – Keynesian) – Circular and cyclical trends of Macroeconomic variables (endogenous and exogenous, dependent and independent, ex-ante and ex-post, stock and flow) – Circular flow of income and Expenditure in two, three and four sector economies. (15Hrs)

**Module II :** Classical model of full employment – Assumptions of Classical economics – Say’s law of markets- Fischer’s equation of exchange- Real theory of interest- wage-price – interest flexibilities- saving-investment equality- labour market – money market – commodity market – neutrality of money – classical dichotomy – criticisms of classical theory. (20 Hrs)

**Module III:** Keynesian model of underemployment equilibrium – wage-price rigidity – meaning, definition and types of unemployment – consumption function – Saving function – investment function — MEC and MEI- interest elasticity of investment – Keynesian model of income determination (two sector, three sector and four sector) – Investment multiplier, Balanced budget multiplier and foreign trade multiplier – Inflationary gap and deflationary gap –Instruments of Fiscal Policy and Monetary Policy. (30 Hrs)

**Module IV:** Keynesian and Post – Keynesian consumption theories – Theory of consumption puzzle - Absolute, Relative, Permanent and Life cycle hypotheses – autonomous and induced investment–Accelerator theory of Investment. (25Hrs)

**Books for Study:**

1. Dornbusch, R., Fisher, S., & Startz, R. (2001). Macroeconomics. Eight Ed.
2. Froyen, R. T., & Perez, S. J. (1990). *Macroeconomics: Theories and policies* , Pearson
3. Rangarajan, C.& Dholakia, B. H. (1979). *Principles of Macroeconomics*. Tata McGraw-Hill Education
4. Turner P. (1993) Modern Macroeconomic Analysis, McGraw-Hill.
5. Errol D’Souza (2008) Macro Economics – Pearson Education.



**Books for Reference:**

1. Mankiw, N. G. (2002). Macroeconomics Worth Publishers.
2. Levačić, R., & Rebmann, A. (1982). An Introduction to Keynesian-neoclassical Controversies
3. Heijdra B., van der Ploeg F. (2002) Foundations of Modern Macroeconomics, OUP.
4. CORE THE ECONOMY The Economy Economics For A Changing World, Available at:  
<http://www.core-econ.org/>
5. Amit Bhaduri(1995) Macroeconomics: Dynamics of Commodity Production, MacMillan

**CORE COURSE X:  
DEVELOPMENT ECONOMICS**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5B10ECO     | 4              | 4      | 3        |

**COURSE OUTCOME**

1. To make the students aware of the methodological and measurement issues relating to growth and development.
2. To enable the students to understand the theory and empirics of Development Economics with special reference to less developed countries
3. To provide an understanding about the various development issues and the development gap between policy and practice.

**Module 1 -Introduction to Development Economics:**

Concept of growth and development- Growth vs development debate Measures of economic Growth and limitations (GDP, Per Capita Income), Measures of economic development and limitations (PQLI, HDI, GDI,GEM HPI,MPI etc) Trend assessment in human development indices, Development gap, Dennis Goulet's core values of development, Introduction to Amartya Sen's capability approach, Development gap (15 hours)

**Module II- Theories of Development**

Development theories: Ideas of Adam Smith, Marxian theory of development, Rostow's stage of growth theory, Schumpeter's innovation theory, Balanced and unbalanced theory: big push theory- critical minimum effort theory- Low Level of Equilibrium Trap- Arthur Lewis theory- Nurkse theory of disguised unemployment as saving potential. Wage good model of Vakil and Brahmanada (20 hours)

**Module III: Growth Models**

Harrods- Domar growth model - Neo- Classical Theory of Growth by Solow- Kaldor's growth model, Joan Robinson's golden rule of capital accumulation (15 hours)

**Module IV: Issues in Economic Development**

Poverty and economic growth, Concept and measurement of poverty, Trends in poverty in India. Measures and strategies for poverty reduction. Inequality: Meaning, measurement and extent of inequality and national level. Economic growth and inequality, Kuznets inverted U hypothesis, Trends in inequality in India. Unemployment: concept, types and status of unemployment in India. Unemployment and economic growth, Concept of inclusive growth in development (22 hours)

**Books for study**

1. A P Thirlwall (2006), *Growth and Development, with Special Reference to Developing Countries*, Palgrave Macmillan.

2. A N Agarwal and S P Singh (Ed.1958) *The Economics of Underdevelopment*, OUP.
3. Misra, S. K., & Puri, V. K. (1986) *Economics of Development and Planning: Theory and Practice*
4. Todaro, M. P. (1977). *Economic Development in the Third World: An Introduction to Problems and Policies in a Global Perspective*. Pearson Education.
5. Sen, Amartya Kumar (1970) *Growth Economics*, Penguin Education
6. Ray, D. (1998). *Development Economics*. Princeton University Press.

#### **Books for Reference**

1. Acemoglu, D., & Guerrieri, V. (2008). Capital Deepening and Non-balanced Economic Growth. *Journal of political Economy*, 116(3), 467-498.
2. Dasgupta, P. (2007). *Economics: A Very Short Introduction*. OUP Oxford.
3. Basu, K., & Maertens, A. (2012). *The New Oxford Companion to Economics in India*. OUP.
4. Patnaik, U. (2013). Poverty trends in India 2004-05 to 2009-10: Updating poverty estimates and comparing official figures. *EPW*, 43-58.
5. Patnaik, U. (2010). Trends in urban poverty under economic reforms: 1993-94 to 2004-05. *EPW*, 42-53.
6. Gangopadhyay, K., & Singh, K. (2013). Extent of Poverty in India: A Different Dimension. *EPW*, 75-83.
7. Himanshu, R., & Sen, A. (2010). Towards New Poverty lines for India. *EPW*, 45(1), 2-8.
8. Dasgupta, P. (2013). The Nature of Economic Development and the Economic Development of Nature. *EPW*, 38-51.
9. Mishra, P. (2013). Has India's Growth Story Withered? *EPW*, 51-59.
10. Prabahath Patnaik, *Economic Growth and Employment*, EPW, Vol: XLV1, No: 26-27, June 25, 2011.
11. Bose, A. & Chattopadhyay, S (2010). The Analytics of Changing Growth Rates, EPW 64-68.

## DEVELOPEMNT ECONOMICS: CORE COURSE X:

### DEVELOPMENT PLANNING: TOOLS AND TECHNIQUES

| SEMESTER | COURSE CODE   | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|---------------|----------------|--------|----------|
| V        | 5B 10 DEV ECO | 4              | 4      | 3        |

#### Course outcomes

1. To equip students to the fundamentals of economic planning and implementation.
2. To know the tools and techniques of development planning and its application in the context of development
3. To impart the knowledge about the issues relating to sustainable development and environmental protection.

#### SYLLABUS

##### **Module: 1: Introduction to Development Planning:**

Development planning: meaning and rationale of economic planning –Types of planning-Short term, medium term and long term planning; planning by direction and planning by inducement; indicative and imperative planning; centralized and decentralized planning ;Totalitarian and Democratic planning ; Physical and Financial planning; Rolling and fixed planning. (13 hours)

**Module: II: Techniques in Planning:** Economic Controls in a planned economy-meaning, need, and types of economic control. Planning strategy,- Investment criteria – Need and Types Minimum Capital-Output ratio criterion , The Social Marginal Productivity criterion , Marginal Per capita Reinvestment Quotient, Marginal Growth contribution criterion , Time series criterion. Choice of techniques: Cost –Benefit analysis and Project evaluation, Uses of Input–Output analysis, Linear Programming-Role of shadow prices in planning. (25 hours)

**Module: III: Economic Planning in India and Kerala:** Planning in a mixed economy- Objectives and strategy of planning in a mixed economy - Plan Models- Harrod –Domar model and Mahalanobis model- Review of five year plans in India: Objectives, resource mobilization, achievements and limitations. Role of planning in a market economy. Planning in the post reform period in India, NITI Aayog: objectives, performance and critical evaluation. Decentralized governance in Kerala: People’s planning, Sustainability of Kerala model of development and emerging developmental challenges (25 hours)

#### **Module IV: Objectives and strategies of Sustainable Development:**

Sustainable Development: Brundtland Commission Report, Meaning and objectives and strategies of sustainable development, Problems of Sustainable Development, UNDP and Millennium Development goals, Report of the Club of Rome, The Earth Summit at Rio De Genero and Recent Developments. (11 hours)

#### **Books for Study**

1. Thirwal, A.P. (1994), Growth and Development-ELBS/Macmillan, London
2. Agarwal, A.N and Kundan Lal (1992) Economics of Development and Planning. Vikas Publishing House Pvt.Ltd, New Delhi
3. Todaro, Michael, P (1993) Economic Development in the Third World, Orient Longman, Hyderabad,
4. Misra and Puri (2007) Economics of Development and Planning –Theory and Practice, Himalaya Publishing House, New Delhi
5. Chakravarthy, Sukhamoy (1987) *Development Planning*, OUP

#### **Books for Reference**

1. Agarwal, R.C (2004) *Economics of Development and Planning* –Theory and Practice, Lakshmi Narain Agarwal Educational Publishers, Agra
2. Debraj Ray (1998) *Development Economics*; Oxford Indian paperbacks
3. Oommen, M.A (1993) *Essays on Kerala Economy*, Oxford IBH. New Delhi.
4. Oommen, MA (1999) *Rethinking Development* –Kerala's Development Experience Vol I&II, Institute of Social Sciences, Concept Publishing Company, New Delhi
5. Ashok Rudra (1985), *India Plan Models*, Allied Publishers, New Delhi.
6. Govt. of India: Planning Commission's Documents.
7. Government of Kerala (2019) *Economic Review*, Kerala State Planning Board, Thiruvananthapuram.

**CORE COURSE XI:**  
**ECONOMICS OF BANKING AND FINANCE**

| SEMESTER | COURSE CODE          | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|----------------------|----------------|--------|----------|
| V        | 5B 11ECO/<br>DEV ECO | 4              | 4      | 3        |

**Course Outcome**

- 1 The students will be equipped with theoretical as well as practical aspects of the structure and working of financial system and regulatory mechanisms.
- 2 The course is expected to expand the skill set of the students for higher studies and employment in finance
- 3 The students will be aware of the innovations and the related trends in the field of banking and finance with special reference to instruments like derivatives.

**Module I Financial System:**

Meaning and functions, financial intermediaries, financial markets, financial instruments. An overview of the structure of Indian financial system. (05 hours)

**Module II Banking and Non- Banking Financial Institutions:**

Commercial Banks- Functions, liabilities and asset structure, principles of sound lending, mechanism of credit creation, role of commercial banks in economic development. Development Banks: meaning and objectives, development banks in India: IDBI, SIDBI, NABARD. NBFIs; meaning and types. Innovations and recent trends in Indian banking sector; ATM, E-Banking, Credit cards, Debit cards, Smart cards, Internet banking, Mobile banking, Core banking, ECS, NEFTS, RTGS. An overview of banking sector reforms in India (Narasimham, Verma, P J Nayak) (36 hours)

**Module III Financial Markets and Instruments:**

Money market, functions, features of Indian money market. Components of money market and their instruments; call money market, commercial bill market, treasury bill market, certificate of deposits, commercial papers, interbank participation certificates, repo instruments. Capital market: features, functions, structure of Indian capital market, primary market and secondary market. Stock exchanges (BSE, NSE), stock market index. Derivative market; meaning, financial derivatives (basic concepts); forwards, futures, options, swaps. Internet trading, (23 hours)

**Module IV Regulatory Mechanism:**

Reserve Bank of India (RBI); functions and powers, Securities and Exchange Board of India (SEBI); objectives, powers and functions. Measures taken by RBI and SEBI to regulate the financial system in India. A brief account of the objectives of IRDAI and PFRDA. (08 hours)

### **Books for Study**

1. Gordon, E., & Natarajan, K. (2009). Financial Markets and Services. Himalaya Publishing House.
2. Narayana Nadar, E (2016) Money and Banking, PHI Learning Private Ltd, Delhi.
3. Machiraju, H. R. (2010). Indian Financial System. Vikas Publishing House.
4. Khan, M. Y. (2013). Indian Financial System. Tata McGraw-Hill Education.
5. Varshney and Maheswari(2005)Banking Theory and Practice, S Chand & Sons
6. Sarma, V. N. (2011). Banking and financial Systems. Cambridge India.
7. Khanna, P. (2005). Advanced Study in Money and Banking: Theory and Policy Relevance in the Indian Economy (Vol. 1). Atlantic Publishers & Dist.
8. Muraleedharan, D. (2014). Modern Banking: Theory and Practice. PHI Learning Pvt. Ltd.
9. Machiraju, H. R. (2008). Modern Commercial Banking. New Age International.
10. Pathak, B. V. (2011). The Indian Financial System: Markets, Institutions and Services. Pearson Education India.
11. Gurusamy. (2009). Indian Financial System, 2E. Tata McGraw-Hill Education.
12. Pathak V V (2012) The Indian Financial System. Pearson's Education Private Ltd.

### **Books for Reference**

1. Chandra, P. (2017). Investment Analysis and Portfolio Management. McGraw-Hill Education.
2. Bhole, L. M. (2004). Financial Institutions and Markets: Structure, Growth and Innovations, Tata McGraw-Hill Education.
3. Misra, B. S. (2010). Credit Cooperatives in India: Past, Present and Future. Routledge
4. De Kock, M.H (1976). Central Banking, Granada Publishing Limited, New Delhi
5. Preetisingh(2010)- Dynamics of Indian Financial System, Ane Books, New Delhi.
6. Chandler, L. V., & Jaffee, D. M. (1977). Regulating the Regulators: A Review of the FINE Regulatory Reforms. Journal of Money, Credit and Banking, 9(4), 619-635.
7. Sayers, R.S (1985) Modern Banking, OUP, Oxford.
8. S K Basu (1980)-Banking Theory and Practice, Macmillan.

**CORE COURSE XII**  
**BASIC TOOLS FOR ECONOMIC ANALYSIS II**

| <b>SEMESTER</b> | <b>COURSE CODE</b>            | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|-------------------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B 12 ECO/<br/>DEV ECO</b> | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

1. To enable the students to understand and interpret economic concepts with the aid of mathematical and statistical tools.
2. To enable students to apply statistical techniques in Economics.
3. To analyze and interpret empirical data with the help of statistical tools

**Module I: Matrices**

Concepts, Types, Operation, addition, subtraction, multiplication, determinants, inverse (for 2x2 matrices only). Solution of simultaneous equations in 3 unknowns using Cramer's rule, solution of simultaneous equations in 2 unknowns using matrix inversion method, solving market equilibrium.

(18 hours)

**Module II: Differential calculus**

Limit and continuity (definition only), differentiation of single variable function: rules, higher order derivatives, sign and magnitude of derivatives and its interpretation – concept of slope, maxima and minima of unbounded functions. Applications of simple derivatives in economics: Elasticity of demand, Marginal Cost and Marginal Revenue. Differentiation of two variable functions: partial derivatives of first and second order- Application of Partial derivatives in economics: Demand analysis and Production analysis-Cobb-Douglas production function.

(32 hours)

**Module III: Bivariate Data Analysis**

Simple correlation – meaning and types and measurement – scatter diagram, Pearson's coefficient and rank correlation coefficient, interpretation. Simple linear regression – meaning, OLS method of estimation. Relationship between correlation and regression coefficients. Examples from economics: Estimation of consumption function, saving function and production function and interpretation of results.

(28 hours)

**Module IV: Time series analysis and Index numbers**

Components of time series, measurement of trend – semi average, moving average, method of least squares. Types of index numbers – weighted and unweighted, price and quantity indices, Laspyer's, Paasche's and Fisher's index numbers. Time reversal and factor reversal tests,



construction of consumer price and wholesale price indices, base shifting and splicing, deflating, uses of index numbers. (30hours)

**Books for Study**

1. Allen, R.G.D. (1980) *Mathematical Analysis for Economists*, Palgrave MacMillan.
2. Monga G.S. (2007) *Mathematics and Statistics for Economists*, Vikas Publishing House, New Delhi.
3. Mehta and Madnani (2000) *Mathematics for Economists*, Sultan Chand & Sons.
4. Gupta S.P (1996): *Statistical Methods*, Sultan Chand& Sons, New Delhi
5. S. C. Gupta (1999) *Fundamentals of Statistics*, Himalaya Publishing House, Delhi.

**Books for Reference**

1. Chiang, A.C (2009): *Fundamental Methods of Mathematical Economics*, McGraw Hill.
2. Yamane, T. (1968). *Mathematics for economists: An Elementary Survey*.
3. Aggarwal, D.M: *Business Mathematics and Statistics*, Ane Books, New Delhi.
4. Yule, G. U., & Kendall, M. G. (1968). *An Introduction to the Theory of Statistics*, Charles Griffin and Co. *Ltd, London*.
5. Spiegel, M. R. (2016). *Schaum's Outlines Probability and Statistics*.

**CORE COURSE XIII:  
MACROECONOMIC ANALYSIS II**

| SEMESTER | COURSE CODE          | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|----------------------|-------------------|--------|-------------|
| VI       | 6B13 ECO/<br>DEV ECO | 5                 | 4      | 3           |

**COURSE OUTCOME**

1. Students will be equipped with a sound idea of advancements in macro economics with tools like IS-LM and the developments there after.
2. Students will be equipped with the theories of economic fluctuations and needed policy intervention
3. Student will be able to develop critical thinking and research inquisitiveness in macro economics
4. Opportunities to higher studies and prospects for employment through the knowledge of theories and concepts in Macroeconomics will be enhanced.

**Module I:** Neoclassical synthesis - integration of Real and Monetary sectors – basic IS-LM model – IS curve and real sector (Derivation of the equation and curve) – LM curve and monetary sector (Derivation of the equation and curve) – General equilibrium – shifts in IS and LM curves – limitations of the basic IS-LM model. (25 hours)

**Module II :** Inflation and Unemployment – Inflation; meaning and types - Causes of inflation – disinflation and sacrifice ratio – interest rate and inflation (Fisher effect ) – relationship between inflation and unemployment – Philips curve and U-I trade off – Stagflation and U - I trade off – Adaptive expectation – natural rate of unemployment (NAIRU) – Long run Philips curve . (25 hours)

**Module III: :** Trade cycles – Meaning and definitions of trade cycles – phases of trade cycles – shorter and longer cycles – theories of trade cycles – Hawtrey’s theory – Hayek’s theory – Keynesian theory – Hicks theory- Samuelson’s theory. (20 hours)

**Module IV:** Money – meaning and definition of money – Difficulties of Barter - functions of money – types of money – demand for money- Quantity theory of money – Cambridge approach - Keynesian demand for money – Restatement of quantity theory of money – Portfolio theories of money demand – Supply of money – measures of money supply in India – Inside money and Outside money – Monetary Base – Fiat money – Seigniorage – Money multiplier – Quantitative and qualitative instruments of Monetary Policy. (20 hours)

**Books for Study:**

1. Dornbusch, R., Fisher, S., & Startz, R. (2001). *Macroeconomics*, Mc Graw Hill
2. Froyen, Richard T(1990)*Macroeconomics : Theories and Policies'* – Pearson
3. Rangarajan, C., & Dholakia, B. H. (1979). *Principles of macroeconomics*. Tata McGraw-Hill Education.
4. Turner P. (1993) *Modern Macroeconomic Analysis*, McGraw-Hill.
5. Errol D'Souza (2008) *Macro Economics* – Pearson Education.

**Books for Reference:**

1. Mankiw, N. G. (2002). *Macroeconomics* Worth Publishers.
2. Levačić, R., & Rebmann, A. (1982). *An Introduction to Keynesian-neoclassical Controversies*.
3. Heijdra B., van der Ploeg F. (2002) *Foundations of Modern Macroeconomics*, OUP.
4. Shapiro, E. (1978). *Macroeconomic Analysis*

**CORE COURSE XIV:**  
**PUBLIC ECONOMICS**

| <b>SEMESTER</b> | <b>COURSE CODE</b>           | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|------------------------------|-----------------------|---------------|-----------------|
| <b>VI</b>       | <b>6B14 ECO/<br/>DEV ECO</b> | <b>5</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOME**

1. Better conceptualization of the economic rationale of govt. in terms of allocation, distribution, stabilization and growth in a federal system
2. Better exposure to resource mobilization by the govt. through innovative fiscal instruments like GST.
3. Students are expected to get an overall perspective of public policy and the development programmes aimed at public welfare as well

**Module 1: Introduction**

Meaning and scope of public economics - Distinction between private and public finance - Fiscal functions (Allocation, Distribution, Stabilization, Growth ) - The Principle of Maximum Social Advantage - Public Goods , Private Goods, Externalities. **[18 hours]**

**Module II: Public Expenditure**

Meaning of public expenditure- Types (Developmental, non developmental, revenue and capital expenditure)- Canons of public expenditure- Theories of public expenditure ( Wagner’s law, Wiseman Peacock hypotheses)- Reasons for the growth of Public Expenditure in India- Trends in public expenditure in India **[ 20hours]**

**Module III: Public Receipts**

(a) **Tax revenue** – Meaning of tax- Canons of taxation- Classification of taxes (Direct and Indirect taxes; Progressive, Proportional, Regressive, Digressive taxes: Specific and Ad Valorem taxes) Impact, incidence and shifting of tax burden (concepts only) - Tax evasion and tax avoidance - Transition of Indirect tax system in India- GST in India and its features- Major trends in tax revenue of the government of India.

(b) **Non- tax revenue** – Commercial Revenue, Administrative Revenue, Gifts and Grants.

(c) **Public debt:** Meaning - Sources of public borrowing- Classification of public debt- Methods of repayment of public debt - Trends in public debt of India. **[28 hours]**

**Module IV: Constitutional Mechanisms in India**

(a) **Budget** - Meaning- Classification (Surplus and deficit budget, Performance, Programme and Zero Base Budgeting) - Budgetary procedures in India- Major budgetary deficit concepts

(Revenue deficit, fiscal deficit, primary deficit and monetized deficit) - Major highlights of the current year's Budget: India and Kerala.

- (b) **Fiscal Federalism:** Meaning of fiscal federalism-Principles of federal finance- Finance commission: Functions of finance commission, Major recommendations of latest finance commission. **[24 hours]**

**Books for Study**

1. Jha, R. (2009). *Modern Public Economics Second Edition*. Routledge.
2. Musgrave, R. A., Musgrave, P. B., & Bird, R. M. (1989). *Public Finance in Theory and Practice* (Vol. 5). New York: McGraw-Hill.
3. Stiglitz, Joseph E and Jay K. Rosengard (2015) *Economics of the Public Sector*, WW Norton & Co
4. Herber, B. P. (1979). *Modern Public Finance*, Richard D. Irwin INC, Illinois.
5. Holley H. Ulbrich (2011) *Public Finance in Theory and Practice*, Routledge.

**Books for Reference**

1. Dalton, H. (2013). *Principles of Public Finance*. Routledge.
2. Myles, G. D. (1995). *Public Economics*. Cambridge University Press.
3. Gupta, J. R. (2007). *Public Economics in India Theory and Practice*. Atlantic Publishers.
4. Mithani, D. M. (1998). *Modern Public Finance: Theory and Practice*. Himalaya House.
5. Singh, S. K. (2008). *Public Finance in Theory & Practice*. S. Chand.
6. Tyagi, B. P (2010). *Public Finance*, Jai Prakash Nath & Co.
7. Rana, K.C & Varma, K.N (2005) *A Study in Public Finance*.
8. Mithani, D. M. (1998). *Modern Public Finance: Theory and Policy*. Himalaya House.

**CORE COURSE XV:  
BASIC ECONOMETRIC ANALYSIS**

| SEMESTER | COURSE CODE          | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|----------------------|-------------------|--------|-------------|
| VI       | 6B15 ECO/<br>DEV ECO | 6                 | 4      | 3           |

**COURSE OUTCOME**

1. This course provides a comprehensive introduction to basic econometric concepts, methodology and techniques of analysis.
2. The Students will acquire knowledge and adequate skills for the development of simple linear econometric models.
3. The students will be able to perform econometric analysis relating to their project work and future research and development.

**Module I: Introduction to Econometrics**

Definition and Scope of Econometrics - Division of Econometrics: Theoretical and Applied Econometrics-Methodology of Econometrics- Stochastic and Non-stochastic relations-Limitations of Econometrics. (24 Hours)

**Module II: Linear Regression Analysis**

Simple regression analysis:-Population regression function- Sample Regression Function- The Method of Ordinary Least Squares(OLS)-Assumptions of OLS-Properties of OLS estimators-The Gauss-Markov theorem-Coefficient of determination ( $r^2$ )-interpretations of regression coefficients–Hypothesis testing –Null and Alternative Hypothesis –Type I error and Type II errors- Level of significance and degrees of Freedom- Basic form of Multiple linear regression model. (35 Hours)

**Module III: Violation of Classical Assumptions of Regression Model**

Multi-collinearity: Meaning, Causes and Consequences of Multi-collinearity- Detection and Remedial measures. Autocorrelation: Meaning, Causes and Consequences of Autocorrelation – Detection of Autocorrelation (Graphical method and the Durbin-Watson Test)-Remedial measures. Heteroscedasticity: Meaning, Causes and Consequences- Detection of Heteroscedasticity (The Glejser test and Goldfeld-Quandt Test) –Remedial measures. (35 hours)

**Module IV: Basic Econometric Applications**

Linear Regression models: Demand function – Non-linear regression models: Cobb-Douglas Production function (basic forms only). (14 hours)

**Books for Study**

1. Gujarati, D. N. (2004). Basic Econometrics. The McGraw– Hill Companies.
2. Koutsoyiannis, A. (1977). *Theory of Econometrics: An Introductory Exposition of Econometric Methods*, Macmillan
3. Studenmund.A.H (2017) Using Econometrics: A Practical Guide, Pearson Education Limited.

### **Books for Reference**

1. Nachane, D. M. (2006). *Econometrics: Theoretical Foundations and Empirical Perspectives*. OUP.
2. Lodha, S., & Soral, G (2016). Evidence for Seasonality and Changes in Seasonal Trends in Indian Stock Market. *IUP Journal of Applied Finance*, 22(3), 87.
3. Greene, W. H. (2003). *Econometric Analysis*, Prentice Hall. New Jersey, 16.
4. Gujarati, Damodar (2015): *Econometrics by Example*, Palgrave Macmillan, New York.
5. Wooldridge, M. Jeffrey (2009) *Econometrics*, Cengage Learning India Pvt. Ltd. New Delhi.
6. Griffiths, W. E., Hill, R. C., & Judge, G. G. (1993). *Learning and Practicing Econometrics*. John Willey and Sons. Inc. New York, USA.

**CORE COURSE XVI:**  
**PROJECT WORK**

| <b>SEMESTER</b> | <b>COURSE CODE</b>           | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b>                    |
|-----------------|------------------------------|---------------------------|---------------|----------------------------------------|
| <b>VI</b>       | <b>6B 16 ECO/DEV<br/>ECO</b> | <b>3</b>                  | <b>2</b>      | <b>EXTERNAL PROJECT<br/>EVALUATION</b> |

The students are directed to identify a relevant project topic in economics or related areas during the V semester itself and approval from the Head of the Department is mandatory. After getting the approval of the project proposal from the Head, they will work on it under the supervision of the concerned faculty members. Students are further requested to complete review of literature, field work, questionnaire, if any, during the V semester itself. Only the writing part may be earmarked for the VI semester. This is for the timely completion and improving the quality of the work. It is the duty of the HoDs to ensure the above procedures.

**Project Guidelines**

1. Approval of the project proposal by the head of the Department
2. Title of the project
3. Introduction
4. Research Objectives
5. Research Questions
6. Review of Literature
7. Methodology and Methods
8. Results and Interpretation
9. Conclusion
10. Bibliography/References
11. Appendix
12. The project work is a team/ group work. Each group shall not exceed five members. The students should ensure that the work is original. It should follow proper reference style, preferably APA style. Two hard copies of the project report should be submitted to the Department on or before February 15.
13. Project valuation: A panel of experts appointed by the university to evaluate the project report at the CV camp (external evaluation =25 marks) and internal evaluation based on Viva Voce exam as per the university norms (internal valuation= 25 marks). The Project work will be treated as a full course and total marks is 50. An examiner may evaluate only 7 projects per day: Four projects in the FN and Three projects in the AN. Remuneration for project evaluation may be fixed by the University.



The time frame and stages of completion of the project work are summarized in table 1. The procedures and other details regarding the project work are summarized in table 2.

**Table 1 Stages of Completion of the Project work**

| Time Period              | Activities                                                                                                | Guide's remarks | Signature of student | HoD |
|--------------------------|-----------------------------------------------------------------------------------------------------------|-----------------|----------------------|-----|
| June                     | Assignment of guide, Preliminary discussions, Selection of the broad area of study.                       |                 |                      |     |
| July to Mid August       | Literature Survey - Formulation of the Problem- Setting up of objectives and Chalking out the methodology |                 |                      |     |
| End of August            | Presentation of the Synopsis and finalization of the Topic and Title                                      |                 |                      |     |
| September                | Data Collection                                                                                           |                 |                      |     |
| November                 | Tabulation and Data Analysis                                                                              |                 |                      |     |
| December                 | Midterm Evaluation to review the progress of the Project                                                  |                 |                      |     |
| January first week       | Submission of the draft report                                                                            |                 |                      |     |
| February first week      | Final draft                                                                                               |                 |                      |     |
| February Second Week     | Oral/ Poster Presentation and internal Viva                                                               |                 |                      |     |
| On or before February 15 | Project submission                                                                                        |                 |                      |     |

**Table 2 Three Stage Evaluation Scheme for Project assessment**

| <b>RUBRIC FOR UG PROJECT ASSSSEMENT (3 Stage Evaluation Scheme)</b> |                                                     |                                                                                                          |                 |                                      |                                  |              |
|---------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------|----------------------------------|--------------|
|                                                                     |                                                     |                                                                                                          | <b>I Stage</b>  | <b>II Stage</b>                      | <b>III Stage</b>                 |              |
| <b>Sl No</b>                                                        | <b>Domain</b>                                       | <b>PROCESS</b>                                                                                           | <b>Internal</b> | <b>Mid-term Evn. Seminar/ poster</b> | <b>Final External @ CV Camps</b> | <b>Total</b> |
| 1                                                                   | <b>Planning &amp; Design</b>                        | Preliminary Discussion Leading to Choice of Topic and Problem                                            | 2               | 4                                    | 5                                | <b>11</b>    |
|                                                                     |                                                     | Construction/ definition of Problem                                                                      |                 |                                      |                                  |              |
|                                                                     |                                                     | Literature Survey / Basic Reading                                                                        |                 |                                      |                                  |              |
|                                                                     |                                                     | Identifying the Problem (and also its clarity)                                                           |                 |                                      |                                  |              |
|                                                                     |                                                     | Choice of Data and their Sources                                                                         |                 |                                      |                                  |              |
| 2                                                                   | <b>Methodology</b>                                  | Sampling Design in case of primary Data & Finalization of Data Set and sources in case of Secondary Data | 2               | 3                                    | 7                                | <b>12</b>    |
|                                                                     |                                                     | Analytical tools & its Suitability                                                                       |                 |                                      |                                  |              |
|                                                                     |                                                     | Tabulation & Analysis                                                                                    |                 |                                      |                                  |              |
| 3                                                                   | <b>Analysis &amp; Discussion of the Results</b>     | Mid-term Review of the progress                                                                          | 2               | 4                                    | 8                                | <b>14</b>    |
|                                                                     |                                                     | Discussion of Result & Validation of the Objectives                                                      |                 |                                      |                                  |              |
|                                                                     |                                                     | Summary & Suggestions/ policy recommendations                                                            |                 |                                      |                                  |              |
| 4                                                                   | <b>Final Report &amp; oral/ Poster Presentation</b> | Final Project & Oral/ Poster Presentation                                                                | 4               | 4                                    | 5                                | <b>13</b>    |
|                                                                     |                                                     | Reference /Bibliography                                                                                  |                 |                                      |                                  |              |
|                                                                     |                                                     | Overall Scientific approach and Academic Commitment                                                      |                 |                                      |                                  |              |
| <b>TOTAL</b>                                                        |                                                     |                                                                                                          | <b>10</b>       | <b>15</b>                            | <b>25</b>                        | <b>50</b>    |

\* Frequency of discussion and finalization of the decisions and timely completion of the each stage must be verified by the guide

\*\* It is not the end results alone but the involvement and commitment of the students in the completion must also equally be valued.

**PART B:**  
**ECONOMICS/DEVELOPMENT ECONOMICS:**  
**COMPLEMENTARY ELECTIVE COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**(2019 ADMISSION ONWARDS)**

| SL NO. | COURSE CODE            | COURSE TITLE                                                           | SEMESTER | HOURS PER WEEK | CREDIT | EXAM HRS | MARKS    |
|--------|------------------------|------------------------------------------------------------------------|----------|----------------|--------|----------|----------|
| 1      | 1 C 01ECO/<br>DEV ECO  | MATHEMATICS FOR<br>ECONOMIC ANALYSIS I                                 | I        | 6              | 4      | 3        | 40+10=50 |
| 2      | 2 C 02 ECO/<br>DEV ECO | MATHEMATICS FOR<br>ECONOMIC ANALYSIS II                                | II       | 6              | 4      | 3        | 40+10=50 |
| 3      | 3 C03 ECO/<br>DEV ECO  | MATHEMATICAL<br>ECONOMCIS I                                            | III      | 6              | 4      | 3        | 40+10=50 |
| 4      | 4 C04 ECO/<br>DEV ECO  | MATHEMATICAL<br>ECONOMCIS II                                           | IV       | 6              | 4      | 3        | 40+10=50 |
| 5      | 1 C05 ECO              | INTRODUCTORY<br>ECONOMICS I<br>(FOR NON-ECONOMICS<br>PROGRAMMES ONLY)  | I        | 6              | 4      | 3        | 40+10=50 |
| 6      | 2 C06 ECO              | INTRODUCTORY<br>ECONOMICS II<br>(FOR NON-ECONOMICS<br>PROGRAMMES ONLY) | II       | 6              | 4      | 3        | 40+10=50 |
| 7      | 3 C07 ECO              | HISTORY OF ECONOMIC<br>THOUGHT I                                       | III      | 6              | 4      | 3        | 40+10=50 |
| 8      | 4 C08 ECO              | HISTORY OF ECONOMIC<br>THOUGHT II                                      | IV       | 6              | 4      | 3        | 40+10=50 |
| 9      | 1 C 09ECO              | POPULATION AND<br>DEVELOPEMNT                                          | I        | 6              | 4      | 3        | 40+10=50 |
| 10     | 2 C10 ECO              | ECONOMIC<br>GEOGRAPHY                                                  | II       | 6              | 4      | 3        | 40+10=50 |
| 11     | 3 C11ECO               | AGRICULTURAL<br>ECONOMICS                                              | III      | 6              | 4      | 3        | 40+10=50 |
| 12     | 4 C12 ECO              | GENDER ECONOMICS                                                       | IV       | 6              | 4      | 3        | 40+10=50 |

**EVALUATION**

| ASSESSMENT | WEIGHTAGE |
|------------|-----------|
| EXTERNAL   | 4         |
| INTERNAL   | 1         |

**INTERNAL ASSESSMENT**

| COMPONENT*                                            | WEIGHTAGE** | REMARKS |
|-------------------------------------------------------|-------------|---------|
| COMPONENT 1<br>EXAM                                   | 50%         | 50%     |
| COMPONENT 2<br>i) Assignment<br>ii) Seminar/Viva<br>- | 50%         | 50%     |

\*Any two components, Attendance shall not be a component

**COMPLEMENTARY ELECTIVE COURSE 01:  
MATHEMATICS FOR ECONOMIC ANALYSIS I**

| <b>SEMESTER</b> | <b>COURSE CODE</b>            | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|-------------------------------|-----------------------|---------------|-----------------|
| <b>1</b>        | <b>1C 01 ECO/<br/>DEV ECO</b> | <b>6</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOME**

1. Students will be equipped with the basics of mathematical tools and their application for better understanding and interpretation of economic theory.
2. This course is expected to provide students with an elementary introduction to mathematical concepts that are used in the study of economics at UG level.
3. The basic outcome of the course will be the enhancement of skills in applying mathematical concepts that are indispensable for in depth study of theoretical as well as empirical economics.

**Module I Functions and Graphs in Economics**

Constants and Variables, Concept of Function - Classes and types of Functions: Single valued and multi-valued, single variable and multi-variable, increasing and decreasing, convex and concave functions. Quasi concavity and monotonicity, Graph of functions: linear, quadratic and cubic, logarithmic, exponential functions and their graphs. Economic functions: Demand function, Supply function, Cost function, Revenue function, Profit function, Utility function, Consumption function, Production function, saving function, Investment function (30 hours)

**Module II Differentiation of Single Variable functions**

Limit and Continuity of Functions - Some important limits - Point continuity and interval continuity - Properties of continuous functions – Derivative and differentiation- Rules of differentiation - Higher Order derivatives - L' Hospitals' rule - Application of Derivatives in economics- Marginal analysis-Unconstrained Maxima and Minima of functions (38 hours)

**Module III Differentiation of multi Variable functions**

Derivatives and Differentials - Partial and total derivatives, Total differential - Higher order Derivatives and differentials - Homogeneous function - properties - Constrained optimization - Lagrange multiplier method. Application of Multivariable differentiation in economics: Marginal analysis (40 hours)

**Books for Study**

1. Edward T Dowling (2001): Introduction to Mathematical economics, Schaum's outline series, McGraw –Hill international edition
2. Srinath Barauh (2010) Basic Mathematics and its Application in Economics, Amanad, New Delhi
3. Peter J Hammond & Knut Sydsaeter (2010) Mathematics for Economic Analysis, Pearson

### **Books for Reference**

1. Allen. R.G.D (1956): Mathematical Analysis for Economists, Macmillan
2. Yamane, Taro (2004): Mathematics for Economists: An Elementary Survey, PHI, New Delhi
3. Chiang. A.C (1988): Fundamental Methods of Mathematical Economics, McGraw Hill.

**COMPLEMENTARY ELECTIVE COURSE 02:  
MATHEMATICS FOR ECONOMIC ANALYSIS II**

| SEMESTER | COURSE CODE           | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-----------------------|-------------------|--------|-------------|
| II       | 2C 02 ECO/<br>DEV ECO | 6                 | 4      | 3           |

**COURSE OUTCOMES**

1. The course will provide the basics of mathematical tools for analyzing economic theory.
2. The analytical ability of students in dealing with economic theories and concepts is expected to be enhanced by involving in calculus and matrix algebra

**Module I: Integral Calculus**

Concept of integration - Integral of single variable function –Indefinite integration- Rules of indefinite Integrals- Integration by substitution and integration by parts –Economic applications of indefinite integration: relationship between total and marginal values- present and discounted values- Definite integral-Properties of definite integration, Economic applications of Definite integration :Area under curve and area between curves- consumer's surplus and producer's surplus  
(38 hours)

**Module II Matrix Algebra - I**

Definition of matrix - types of matrices - operation on matrices —determinants – properties of determinants –inverse of a matrix - Cramer's rule - Gauss elimination method - solving a system of linear equations  
(40hours)

**Module III Matrix Algebra - II**

Linear independence and rank of matrix - characteristic root or Eigen value –quadratic functions- The discriminants and Sign definiteness of quadratic functions- Optimization conditions of quadratic forms subject to linear constraints.  
( 30 hours)

**Books for Study**

1. Dowling E.T (2003) Introduction to Mathematical Economics, 2nd Edition, Schaum's Outline Series, McGraw-Hill, New York.
2. Chiang A.C. and K. Wainwright (2013) Fundamental Methods of Mathematical Economics, Tata McGraw-Hill Education; Fourth edition
3. Allen R.G.D (1976) Mathematical Economics 2 ed., Macmillan
4. Boumol. W. J (1987) Economic Theory and Operations Analysis, 4 ed., Prentice Hall of India.

**Books for Reference**

1. Colell, A. Mas et. Al (1991) Microeconomic Theory, Harvard University Press.
2. Hands, D.W. (1991) Introductory Mathematical Economics, D.C. Heath.
3. Handy, S.T. (1997) Operations Research, Prentice-Hall of India, New Delhi.  
Mukherji, B. and V. Pandit (1982) Mathematical Method of Economic Analysis, Allied Publishers, New Delhi.

**COMPLEMENTARY ELECTIVE COURSE 03:**  
**MATHEMATICAL ECONOMICS-I**

| <b>SEMESTER</b> | <b>COURSE CODE</b>            | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|-------------------------------|-----------------------|---------------|-----------------|
| <b>III</b>      | <b>3 C03 ECO/<br/>DEV ECO</b> | <b>6</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOMES**

1. Understanding of the basic mathematical concepts and tools will be improved.
2. Students will be able to conceptualize economic problems mathematically and develop skills in applying mathematical tools and techniques in microeconomic theory.

**Module I Introduction to Mathematical economics**

Meaning and scope of Mathematical Economics – Role of mathematics in economics- Mathematical formulation of economic theories (Law of demand, Law of supply)- Variables, constant and coefficients- Limitation of Mathematical Economics (18 hours)

**Module II Theory of Consumer Behaviour**

Consumer equilibrium- Utility function- - Cardinal and ordinal utility approaches – Indifference curves and its mathematical properties- Constraint Maximization (First and second order conditions)- Demand functions –Ordinary and compensated demand functions - Elasticity of demand- Price elasticity, income elasticity and cross elasticity of demand – Derivation of Slutsky equation – Cases of normal, inferior and Giffen goods (29 hours)

**Module III Theory of Producer Behaviour**

Production function - Homogeneous and non-homogeneous production functions –Cobb-Douglas and CES functions– Elasticity of substitution – Constraint output maximization and cost minimization- Revenue and cost functions- Profit maximization (first and second order condition)- Relationship between AR, MR and elasticity of demand.( 45 hours )

**Module IV Price and Output Determination**

Equilibrium of firms under different market structures- perfect competition and monopoly- Price and output determination under discriminating monopoly.( 16 hours)

**Books for Study:**

1. Henderson, James M and Quandt, R E (1980): Microeconomic Theory: A Mathematical Approach, McGraw Hill Book Company.
2. Heathfield D.F and Wibe, Soren (1987): "An Introduction to Cost and Production Functions" Macmillan.
3. Dowling E.T(2003), Introduction to Mathematical Economics, Schaum's Outline Series, McGraw-Hill, New York

**Books for Reference:**

1. Allen, R.G.D. (1974) *Mathematical Analysis for Economists*, Macmillan Press, London.
2. Chiang, A.C. (1986) *Fundamental Methods of Mathematical Economics* (3<sup>rd</sup> Edition), McGraw Hill, New Delhi.
3. Colell, A.Mas et.al (1991) *Microeconomic Theory*, Harvard University Press.
4. Hands, D.W. (1991) *Introductory Mathematical Economics*, D.C. Heath.
5. Handy, S.T. (1997) *Operations Research*, PHI, New Delhi.
6. Mukherji, B. and V. Pandit (1982) *Mathematical Method of Economic Analysis* Allied Publishers, New Delhi.



**COMPLEMENTARY ELECTIVE COURSE 04:  
MATHEMATICAL ECONOMICS-II**

| <b>SEMESTER</b> | <b>COURSE CODE</b>            | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|-------------------------------|---------------------------|---------------|---------------------|
| <b>IV</b>       | <b>4C 04 ECO/<br/>DEV ECO</b> | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES:**

1. The course will provide an understanding of the fundamental concepts of linear programming, input output analysis and game theory and their applications in economics.
2. It will enhance the capacity of the students in recognizing an economic variable with the help of mathematical tools

**Module: I Linear Programming**

Concept – Basic assumptions - Formulation of LPP – Solution to LPP : Graphic method, Extreme point theorem, solutions to maximization and minimization problems – Simplex method : Solutions to maximization problems – Duality in LPP – Formulation of dual – Characteristics – Economic interpretation of dual – Applications and limitations of linear programming. (45 hours)

**Module II Input – Output Analysis**

Concept – Main features – Assumptions - Technical coefficients and Technological matrix – Open and Closed model – Static and Dynamic model – Solutions to two sector and three sector models – Technological viability and Hawkins – Simon conditions – Applications and Limitations of input output analysis. (40 hours)

**Module III Game Theory**

Fundamental concepts- – Two person zero sum game – Solution of pure strategy games : Maximin and Minimax strategy, Saddle point – Solution of mixed strategy problems : Arithmetic method – Principle of dominance – Graphic method – Transforming game to LPP - Concept of Nash equilibrium and Prisoner's Dilemma. (23 hours)

**Books for Study**

1. Dowling E.T (2003) Introduction to Mathematical Economics, 2nd Edition, Schaum's Outline Series, McGraw-Hill, New York.
2. Chiang A.C. and K. Wainwright (2013) Fundamental Methods of Mathematical Economics, Tata McGraw-Hill Education; Fourth edition
3. Allen R.G.D (1976) Mathematical Economics 2 ed., Macmillan
4. Boumol. W. J (1987) Economic Theory and Operations Analysis, Prentice Hall of India.

**Books for Reference**

4. Colell, A. Mas et. Al (1991) Microeconomic Theory, Harvard University Press, Cambridge.
- Hands, D.W. (1991) Introductory Mathematical Economics, D.C. Heath.
5. Handy, S.T. (1997) Operations Research, Prentice-Hall of India, New Delhi.
- Mukherji, B. and V. Pandit (1982) Mathematical Method of Economic Analysis, Allied Publishers, New Delhi.

**COMPLEMENTARY ELECTIVE COURSE 05:  
INTRODUCTORY ECONOMICS -I**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 1        | 1C 05 ECO   | 6              | 4      | 3        |

**COURSE OUTCOME**

1. The students will get an overall background of the economic theory
2. Specific inputs from micro economics covering the fundamental concepts will improve their analytical skills

**Module I: Introduction to Economics**

Definition of Economics- Micro and macro economics- Scarcity and choice-Production possibility curve-Central problems of an Economy-Role of price mechanism (20 hrs)

**Module II: Demand analysis**

Law of Demand-Elasticity of demand-price, cross and Income elasticity of Demand-Measurement of elasticity of demand -Cardinal Utility approach-Law of Diminishing Marginal Utility-consumers surplus-Ordinal utility- Indifference Schedule -Indifference curve Analysis- Properties of Indifference Curve (20 hrs)

**Module III: Theory of production, cost and revenue**

Production function-factors of production - Laws of production-Short run (Law of variable proportions)-Long run (Returns to scale)-Economies and diseconomies of Scale-Cost function - Types of costs-cost curves(TC,TFC,TVC,AVC,AFC,AC,MC)-Revenue and Revenue curves(TR,AR and MR) (28 hrs)

**Module IV: Market forms and Distribution theory**

i) Perfect Competition and its features- Equilibrium of the firm in short run and long run- Monopoly and its features-price and output determination under Monopoly-Price discrimination- Monopolistic competition and its features -price and output determination under Monopolistic Competition.

- ii) Marginal productivity theory of distribution- Rent and Quasi rent Wages-Nominal and real wages- subsistence wages- Interest-natural and market rate of interest- profits-Gross and Net profits (40 hrs)

**Books for study**

1. Mankiw, Gregory N(2008)Microeconomics, Worth Publishers
2. Koutsoyiannis(2010) A Modern Microeconomics, MacMillan
3. Dominik Salvatore (2010) Principles of Microeconomics, Oxford, International Student Edition.

**Books for Reference**

1. Dwivedi, D.N(2002): Microeconomics: Theory and Applications, 2nd Ed., Pearson, New Delhi
2. Watson and Getz (2011) Price Theory and its Uses', New Delhi: AITBS Publisher.

**COMPLEMENTARY ELECTIVE COURSE 06:  
INTRODUCTORY ECONOMICS II**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| II       | 2C 06 ECO   | 6              | 4      | 3        |

**COURSE OUTCOME**

1. To familiarize the students about the subject matter of economics mainly relating to concepts in macro economics and public finance.
2. Students are expected to get an awareness of the development issues of Indian economy with special reference to poverty, inequality, unemployment and black economy.

**Module I: National Income Accounting**

Concepts of National income [GNP/GVA, NNP, NI, Personal Income, Disposable Income, per-capita income] Computation of NI- Methods and Difficulties (20 hrs)

**Module II: Money and Banking**

Barter system -Meaning of money-type, role and functions of money -functions of commercial banks- Central Banks - Role and functions of RBI--Instruments of credit control-Quantitative methods [Bank rate, open market operations, Repo rate, Reverse repo rate, CRR, SLR] - Qualitative or selective credit control methods. (24 hrs)

**Module III: Public Finance**

Scope and subject matter-sources of public revenue (tax revenue and non tax revenue) –public expenditure -public debt- methods of debt redemption- Budget-types of budget (33 hrs).

**Module IV: Development issues of Indian economy**

Poverty, Inequality, Unemployment and Black money- Demonetization –Features of Kerala economy-Kerala model of development- decentralized planning in Kerala-Demographic profile of Kerala with latest census report (32 hrs)

**Books for Study**

1. Dewett KK (2002): Advanced Economic Theory, S.Chand
2. Mankiw, Gregory N(2007) ‘Macroeconomics’ – Worth Publishers
3. Uma Kapila(2012)Indian Economy Since Independence, Academic Foundation
4. Prakash, BA(2004) Kerala’s Economic Development Emerging Issues and Challenges, Sage
5. Mithani, D.M(2010): Modern Public Finance: Theory and Practice , Himalaya Publishing House

**Books for Reference**

1. Lekhi, R.K(2010) Public Finance, Kalyani Publishers
2. Hajela, T.N(2012) Public Finance , ANE Books
3. Gupta, DP and Gupta, R K – Modern Banking in India, Asian Books Private Ltd.

**COMPLEMENTARY ELECTIVE COURSE 07:**  
**HISTORY OF ECONOMIC THOUGHT- I**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>III</b>      | <b>3C 07 ECO</b>   | <b>6</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOMES**

1. Students are expected to get an idea of the economic philosophy in a historical perspective
2. Students are also exposed to heterogeneous thinking in economics

**Module I: Introduction and Pre Classical Economic Thought**

Scope and significance of Economic Thought – Ancient Economic thought: Economic ideas of Aristotle and Plateau – Doctrines of Just Cost and Just Price – Medieval Economic Thought: Francois Quesnay - Abu Yusuf and Ibn Khaldun – Economic Ideas of Mercantilism: St.Thomas Aquinas, Thomas Mun – Physiocracy: Natural Order, Tableau Economique **(30 hours)**

**Module II: Classical Economic Thought**

Classicism: Features – Ideas of (i) Adam Smith: concept of Laissez faire, invisible hand, division of labour, naturalism and optimism, theory of value, canons of taxation- critiques of Adam Smith’s thought –(ii) David Ricardo: theory of rent, theory of distribution, ideas of economic development and foreign trade, stationary state, criticism (iii) J.B Say: Says Law of Market and its implications (iv) T.R. Malthus: theory of population and theory of glut, criticism – (v) J.S. Mill : Reciprocal demand (vi) Jeremy Bentham: Utilitarianism **(36 hours)**

**Module III: Socialist Economic thought**

Early socialists: Contributions of St.Simon and Sismondi – Utopian Socialism: Ideas of Robert Owen, Charles Fourier, Proudhon and Louis Blanc – State Socialists: Robertus and Lasalle **(24 hours)**

**Module IV: Basic Tenets of Marxian Political Economy**

Marx’s Method : Dialectical Materialism – Mode of Production –Capitalist Production – Labour theory of Value - Surplus Value – Organic Composition of Capital – Declining Rate of Profit - Accumulation of Capital – Industrial Reserve Army – Immiserization of the Proletariat – Concentration and Centralization of Capital – Capitalism and Crisis – Relevance of Marxian Economics in the Contemporary Capitalist World - Lenin’s Theory of Imperialism – Democratic Socialism **(18 hours)**

**Books for Study:**

1. Robert B Ekelund, Jr. and Robert F. Hebert (2007) A History of Economic Theory and Method, Waveland Press.

2. Ernesto Screpanti and Stefano Zamagni (2005) An Outline of the History of Economic Thought, OUP.
3. Phyllis Deane (2012) The Evolution of Economic Ideas, Cambridge University Press
4. Haney, Lewis (1949) History of Economic Thought, Macmillan
5. Eric Roll (1961) A History of Economic Thought, Prentice-Hall, New York
6. Landreth, Harry and Colander, David (2002). History of Economic Thought. Houghton Mifflin

**Books for Reference:**

1. Sandelin, Bo, Trautwein, Hans, Wundark, Richard (2008). A Short History of Economic Thought. Routledge.
2. Hollis, Martin (2008). The Philosophy of Social Science: an introduction. Revised and Updated. Cambridge University Press.
3. Barber, William (2009) A History of Economic Thought, Wesleyan University Press
4. Lekachman Robert (1989) A History of Economic Ideas, McGraw Hill
5. Ganguli B.N , Indian Economic Thought: A Nineteenth Century Perspective
6. Gagan Jain, Nobel Prize winners in Economics, Publisher: Three Essays Collective
7. Ghosh and Ghosh (2015), Concise History of Economic Thought, Himalaya Publishing House, New Delhi

**COMPLEMENTARY ELECTIVE COURSE 08:**  
**HISTORY OF ECONOMIC THOUGHT- II**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>1V</b>       | <b>4C 08 ECO</b>   | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOMES**

1. Students are expected to get an idea of the economic philosophy in a historical perspective
2. Students are also exposed to some of the heterogeneous thinking in economics like Neoclassical, Keynesian and Indian economic thinking

**Module I: Marginalism and Neo Classical School**

The marginal revolution : Ideas of Herman Heinrich, Gossen, William Stanely Jevons, Leon Walras and Carl Menger, Frederich List, Wieser, Bohm-Bawerk, Wicksell ,Wicksteed, Veblen, Institutionalism, Wilfredo Pareto, Alfred Marshall, A.C Pigou and Irving Fisher –Difference between Classical and Neo-classical approach (38 hours)

**Module II Keynes and Post Keynesians**

Keynes as a critique of Classical Economics – Keynesian theory of Employment: Effective Demand, Underemployment equilibrium– Concept of Multiplier – Post Keynesian Developments: Monetarism and New Classical School: Rational Expectation (30 hours)

**Module III Indian Economic Thought**

Ancient Indian Economic Thought: Kautilya and Thiruvalluvar. Modern Indian Economic Thought: Dada Bai Naoroji, M G Ranade, R.C. Dutt, J K Mehta, Economic Ideas of M K Gandhi, Dr. B.R. Ambedkar, M.S. Swami Nathan, Amartya Sen (30 hours)

**Module IV Nobel Laureates in Economics**

History of Nobel Prize – Nobel laureates in economics: Contributions of Gunnar Myrdal, Arthur Lewis, Elinor Ostrom, Thaler, Amartya Sen and Nordhaus (Current Nobel laureate in economics) [10 hours]

**Books for Study:**

1. Haney, Lewis (1949) History of Economic Thought, Macmillan
2. Eric Roll (1961) A History of Economic Thought, Prentice-Hall, New York
3. Robert B Ekelund, Jr. and Robert F. Hebert (2007) A History of Economic Theory and Method, Waveland Press.
4. Ernesto Screpanti and Stefano Zamagni (2005) An Outline of the History of Economic Thought, OUP.
5. Phyllis Deane (2003) The Evolution of Economic Ideas, Cambridge University Press

6. Landreth, Harry and Colander, David (2002). History of Economic Thought. Houghton Mifflin

**Books for Reference:**

1. Sandelin, Bo; Trautwein, Hans; Wundark, Richard (2008). A Short History of Economic Thought. 2nd Edition. Routledge.
2. Hollis, Martin (2008). The Philosophy of Social Science: an introduction. Revised and Updated. Cambridge University Press.
3. Barber, William (2009) A History of Economic Thought, Wesleyan University Press
4. Lekachman Robert (1989) A History of Economic Ideas, McGraw Hill
5. Ganguli B.N, Indian Economic Thought: A Nineteenth Century Perspective
6. Gagan Jain DLit, Nobel Prize winners in Economics, Publisher: Three Essays Collective
7. Ghosh and Ghosh (2015) Concise History of Economic Thought, Himalaya Publishing House, New Delhi



**COMPLEMENTARY ELECTIVE COURSE 09:**  
**POPULATION AND DEVELOPEMNT**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>1</b>        | <b>1C 09 ECO</b>   | <b>6</b>                  | <b>4</b>      | <b>3</b>            |

**COURSE OUTCOME**

1. Students will be able to identify the linkage between population and development
2. Students will be able to get an idea of the basic demographic concepts like fertility, mortality, migration and urbanization
3. Students are also expected to get an understanding on the regional, national and global population trends

**Module I: Introduction**

Meaning, Nature, Scope and Importance of Population Studies- Difference between Demography and Population Studies- Subject matter of Population Studies; Structure, Size, Characteristics and Distribution of population- Components of population change viz fertility, mortality and migration- Sources of Population Data; Census, Sample Surveys, Registration of Vital Events and NPR- Population and Economic Development- Inter relationship between Population and Development- Theories of population: Theory of Demographic Transition, Malthusian theory of population and Optimum theory of Population (35 hours)

**Module II: Measures of Fertility and Mortality**

Measures of Fertility: Crude Birth Rate, General Fertility Rate, Age Specific Fertility Rate, Total Fertility Rate, Gross Reproduction Rate and Net Reproduction Rate.

Measures of Mortality: Crude Death Rate, Age Specific Mortality Rate, and Infant Mortality Rate- Life Expectancy- Neo Natal Death Rate and Post Neo Natal Death Rate (18 hours)

**Module III: Migration and Urbanization**

Migration- meaning, types, determinant and consequences- Causes of Migration- Theories of Migration- Evert Lee's theory of Migration and Ravenstein's Laws of Migration. Urbanisation- Meaning, Definition, Causes and consequences of Urbanisation (30 hours)

**Module IV: Trends in Population Growth**

Population growth trends in Kerala, India and the world- Age composition of India and Kerala- Ageing- National Population Policy- Family Welfare Programmes- Age Pyramids- - Population Dividend- Zero Population Growth- Population Projection- Stable, Stationary and Quai-stationary Population (25 hours)

**Books for Study**

1. Asha.A Bhande & Tara Kanikkare (2000) Principles of Population Studies, Himalaya Publishing House.
2. Misra, B. D. (1982). *An Introduction to the Study of Population*. South Asian Publishers.
3. Bougue, D.J (1971) Principles of Demography, Wiley

**Books for Reference**

1. Peter.R. Cox (1981), Demography, Universal Book Stall, New Delhi.
2. Demeny and Geoferry Menicoll (1998) Population and Development, Earth Scan Publications.
3. Agarwal,S.N(2000) India's Population Problem, Tata Mc Grew Hills
4. Sreenivasan,K and K.B. Pathak, Dynamic of Population and Family Welfare, Himalaya Publishing House, New Delhi.
5. Prasad.P.K, (2010) Population Planning; Policy and Programmes, Deep and Deep Publishers, New Delhi.
6. Zakaria, KC and S.Irudyarajan (2004) Kerala's Demographic Transition: Determinants and Consequences, Sage, New Delhi.
7. Govt of India: Census 2011

**COMPLEMENTARY ELECTIVE COURSE 10:  
ECONOMIC GEOGRAPHY**

| SEMESTER  | COURSE CODE     | HOURS PER WEEK | CREDIT   | EXAM HRS |
|-----------|-----------------|----------------|----------|----------|
| <b>II</b> | <b>2C10 ECO</b> | <b>6</b>       | <b>4</b> | <b>3</b> |

**COURSE OUTCOME**

1. Students will be exposed to the emerging branch of economic geography.
2. The course will provide preliminary inputs for sharpening their analytical tools of economic geography.
3. Students will also get an idea of geography of key economic variables in the Indian context

**Module 1:**

Economic Geography – Philosophy, Nature, Scope and Significance – Economic Geography and Inter-disciplinarily – Key Concepts in Economic Geography – Cluster, Core, Periphery, Agglomeration, Space, Place and Scale - World Economic Geography: Geography of Global Income Disparity (20 Hours)

**Module 2:**

Theoretical Approaches in Economic Geography – Neo-classical Spatial Equilibrium: Centre Place Theory & Cumulative Causation – Marxist Inspired Approaches to Uneven Development: Spatial Division of Labour Theory – Immanuel’s Core–Periphery Theory – New Economic Geography – Krugman’s Centre–Periphery Model. (35 Hours)

**Module 3:**

Geography of Growth and Development in India: Regional Disparities in Income, Human Development, Poverty and Unemployment, Geography of Sectoral Growth in India: Agriculture, Industry and Services (25 Hours)

**Module 4:**

Factors Responsible for Regional Imbalances India - Economic Policies for Addressing Regional Imbalances in India: Planning for Regional Development: Five Year Plans and Decentralised Planning (28 Hours)

**Books / Reports for Study**

1. M. Sokol, (2011), “Economic Geography” International programmes, University of London - London School of Economics
2. Saxena (2014) Economic Geography, Rawat Publications
3. Krugman (1991) Geography and Trade, Cambridge IT press.

**Books / Reports for Reference**

1. Scott, A. J. (2017). A Perspective of Economic Geography. In *Economy* (pp. 3-23). Routledge.

2. Krugman, P. (1991). Increasing Returns and Economic Geography. *Journal of Political Economy*, 99(3), 483-499.
3. Kurian, N. J. (2000). Widening Regional Disparities in India. *EPW*, 35(7), 538-550. UNCRD (2012), Regional Planning and Development
4. Nayyar, G. (2008). Economic Growth and Regional Inequality in India. *EPW*, 58-67.

**COMPLEMENTARY ELECTIVE COURSE 11**  
**AGRICULTURAL ECONOMICS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>III</b>      | <b>3C11 ECO</b>    | <b>6</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOME**

1. The course is expected to provide a basic knowledge of the essentials of agricultural economics
2. Students are expected to get an opening for higher studies and research in agricultural economics
3. The course will help students to get an agrarian entrepreneurship towards a source of livelihood.

**Module I:** agricultural Economics – nature and scope – role and importance of Agriculture  
Economic development – inter-linkages between agricultural and non-agricultural sectors (15 hours)

**Module II:** Agrarian relations – land reforms with special focus on India and Kerala – technology in Agriculture – Green revolution – sustainable agriculture – emerging trends in agricultural technology - Biotechnology (25 hours)

**Module III** Agricultural production and productivity – Production relationships – types of farming – subsidies – input subsidies and Indian Agriculture – Crop Insurance – Agricultural Finance – Agricultural Marketing – structure and problems of Agricultural finance and marketing in India– WTO and Indian Agriculture– Challenges and prospects- (35 hours)

**Module IV:** Agricultural performance of India and Kerala– Five year plans and Indian agriculture – crop diversification – organic farming – farm management – Agricultural extension – food security – New Economic Policy and agriculture – Agricultural policy – Major issues of Kerala agriculture.(30 hours)

**Books for Study:**

1. Amarjit Singh, A N Sadhu, Jasbir Singh (2002), 'Fundamentals of Agricultural Economics' – Himalaya Publishing House
2. SAR Bilgrami (2018) 'An Introduction to Agricultural Economics' - Himalaya Publishing House, Mumbai
3. Dutt and Sundaram (2009) 'Dutt and Sundaram's Indian Economy', S Chand and Co.
4. Govt of Kerala (2018) Economic Review, Kerala State Planning Board, Thiruvananthapuram

**Books for Reference**

1. Joginder Singh and Lekhi, R.K (2017) 'Agricultural Economics: An Indian Perspective' – Kalyani Publishers, Bengaluru
2. Subba Reddy, S et.al (2008) Agricultural Economics, OUP

**COMPLEMENTARY ELECTIVE COURSE 12:**  
**GENDER ECONOMICS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HRS</b> |
|-----------------|--------------------|-----------------------|---------------|-----------------|
| <b>1V</b>       | <b>4C 12 ECO</b>   | <b>6</b>              | <b>4</b>      | <b>3</b>        |

**COURSE OUTCOMES**

1. Students will be having an understanding of the basic concepts relating to gender as a social construct and its link with development.
2. Students are exposed to gender challenges to development

**MODULE 1: Introduction to Gender Economics**

Meaning and importance of gender economics – Definition of gender: LGBTQ– Distinction between gender and sex- gender equity and gender equality– Patriarchal and Matriarchal families – Approaches of gender development: WID, WAD and GAD - Gender inequality indices - GDI, GII, GEM (18 hours)

**MODULE II : Gender Status in India**

Demography of female population in India : Sex ratio, Mortality, Morbidity and life expectancy – Gender inequalities in education - Health and nutrition – feminization of poverty – Concept of missing women – National Rural Health Mission – Equity in health delivery system. (20 hours)

**MODULE III: Women and Labour Market**

Discrimination in the labor market – Wage disparity- paid & unpaid work- Productive & unproductive work – Visible and invisible work –Female work participation rate – LFPR and Gender discrimination - Occupational segregation - Triple role of women- Housewifisation – Feminization and gender inequality (32 hours)

**MODULE IV: Women Empowerment**

Concept of women empowerment – Political participation & decision making: Ratio of Women law makers in the Centre, State and Local bodies - Education and Socio Economic empowerment – Issues related to women’s education –Access, Enrolment, Dropouts - Women empowerment programmes in India with special reference to Kudumbasree in Kerala – Role of Government, NGOs and Self Help Groups in Women Empowerment. (38 hours)

**Books for Study**

1. Boserup, E. (1970). Women’s Role in Economic Development George Allen and Urwin.
2. Desai,N. and M.K.Raj(1974),Women and Society in India, Research Centre for Women Studies, SNDT University, Bombay
3. Seth .M. (2000), Women and Development: The Indian Experience, Sage.
4. Pal, M., Bharati, P., Ghosh, B., & Vasulu, T. S. (2012). *Gender and Discrimination: Health, Nutritional Status, and Role of Women in India*. OUP.

5. Venkateswaran, S. (1995). *Environment, Development and the Gender Gap*. Sage.

**Books for Reference**

1. National Commission for Women, Towards Equality- The Unfinished Agenda- Status of Women in India -2001, New Delhi, (2002)
2. Peterson J and M Lewis (ed.2001), The Elgar Companion to Feminist Economics
3. Agarwal ,Bina ,(1994)A Field of One's Own: Gender and Land Rights in South Asia, Cambridge University Press, New Delhi
4. Government of India (1974) Towards Equality-Report of the Committee on the Status of Women in India, Department of Social Welfare, Ministry of Education and Social Welfare, New Delhi.
5. Krishnaraj.M, R. M Sudarshan and A.Shariff (1999) Gender, Population and Development, OUP, New Delhi
6. Srinivasan, K and A.Shroff (1998), India: towards population and Development Goals, OUP, New Delhi
7. Wazir, R, (2000) The Gender Gap in Basic Education: NGOs as Change Agents, Sage.
8. Govt.of India (2009) Gender Equality and Women's Empowerment in India, National Family Health Survey 2005-06, Ministry of Family Welfare, New Delhi.
9. Das, Kumar, (2009) Gender Dynamics in Economic Development of India, Reference Press, New Delhi
10. Sen, Sujata (2012), Gender Studies, Dorling Kindersley (India) Pvt.Ltd & Pearson
11. Sen, Suvarna (2006), Gender and Development, ICFAI University Press, Hyderabad.

**PART C:**

**ECONOMICS/DEVELOPMENT ECONOMICS: GENERIC ELECTIVE COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**(2019 ADMISSION ONWARDS)**

EACH DEPARTMENT SHALL OFFER A POOL OF FIVE GENERIC ELECTIVE COURSE AT A TIME, TRANSACTION THROUGH GUIDANCE MODE. STUDENTS OF OTHER DEPARTMENTS CAN CHOOSE ANY ONE OF THE GENERIC ELECTIVE COURSE FROM THE POOL OF FIVE COURSES. ALL DEPARTMENTS (WHETHER IT IS A CORE DEPARTMENT OR COMPLEMENTARY DEPARTMENT CAN OFFER THE COURSE IN SEMESTER V)

| <b>COURSE CODE</b>         | <b>COURSE TITLE</b>                      | <b>SEMESTER</b> | <b>HOURS/ WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> | <b>MARKS EXT+INT</b> |
|----------------------------|------------------------------------------|-----------------|--------------------|---------------|-------------------|----------------------|
| <b>5 D 01 ECO/ DEV ECO</b> | BASICS OF ECONOMICS                      | <b>V</b>        | 2                  | 2             | 2                 | 20+5                 |
| <b>5 D 02 ECO/ DEV ECO</b> | DEVELOPMENT ISSUES OF INDIAN ECONOMY     | <b>V</b>        | 2                  | 2             | 2                 | 20+5                 |
| <b>5 D 03 ECO/ DEV ECO</b> | KERALA ECONOMY                           | <b>V</b>        | 2                  | 2             | 2                 | 20+5                 |
| <b>5 D 04 ECO/ DEV ECO</b> | FUNDAMENTALS OF BUDGET                   | <b>V</b>        | 2                  | 2             | 2                 | 20+5                 |
| <b>5D 05 ECO/ DEV ECO</b>  | INDIAN ECONOMY IN THE POST-REFORM PERIOD | <b>V</b>        | 2                  | 2             | 2                 | 20+5                 |

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> |
|-------------------|------------------|
| EXTERNAL          | 4                |
| INTERNAL          | 1                |

**INTERNAL ASSESSMENT**

| <b>COMPONENT *</b>                        | <b>WEIGHTAGE**</b> | <b>REMARKS</b> |
|-------------------------------------------|--------------------|----------------|
| COMPONENT 1<br>EXAM.<br>-----             | 50%                |                |
| COMPONENT 2<br>ASSIGNMENT<br>VIVA/SEMINAR | 50%                |                |

\*Any two components, Attendance shall not be a component



**GENERIC ELECTIVE COURSE 01:**  
**BASICS OF ECONOMICS**

| <b>SEMESTER</b> | <b>COURSE CODE</b>           | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|------------------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D 01ECO/<br/>DEV ECO</b> | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**COURSE OUTCOMES:**

1. Students will have an understanding of the basic concepts of economics in everyday life
2. Students will be able to get an idea of major economic issues

**Module I: Introduction to Economics**

Definition of Economics – Nature and scope of economics – Problems of scarcity and choice: The three key economic questions – Opportunity Cost - Micro and Macro economics –Elementary theory of demand: determinants of household demand, market demand, movement along and shift of the demand curve – Elementary theory of supply: determinants of supply, movement along and shift of supply curve – Market equilibrium

**Module II Market and Economy**

Forms of Market: Features of Perfect competition, Monopoly, Monopolistic Competition and Oligopoly – Characteristics of a good economy - Types of Economy: Features of Capitalist, Socialist and Mixed Economy- Growth and Development- Issues in Economic Development: Causes of Poverty, Unemployment and Inequality – Basic concepts of National income: GNP, GDP, NNP and PI – Functions of Money – Basic concepts: CRR and SLR, Repo rate, Surplus and Deficit Budget

**Books for Study**

1. Dominick Salvatore(2004) Microeconomics : Theory and Applications, OUP, New Delhi
2. Pindyck Robert and Rubinfeld Daniel (2014) Micro Economics 8<sup>th</sup> Edition Pearson.
3. Dwivedi,D N(2011) Macro Economics Theory and Policy 5<sup>th</sup> Edition , McGraw Hill.
4. Fernando, A.C(2010) Indian Economy , Pearson India Education Services Pvt.Ltd
5. Gaurav Datt and Ashwani Mahajan(2016) , Indian Economy, S.Chand New Delhi

**Books for Reference**

1. Mankiw, Gregory N (2009) Principles of Macroeconomics‘–Cengage Learning India Pvt. Ltd.
2. Errol D’Souza (2008) Macro Economics – Pearson Education.
3. Ashok Thomas et.al.(2018) Macro Economics, McGraw Hill Education (India) Edition

**GENERIC ELECTIVE COURSE 02:  
DEVELOPEMNT ISSUES OF INDIAN ECONOMY**

| SEMESTER | COURSE CODE          | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|----------------------|----------------|--------|----------|
| V        | 5D 02ECO/<br>DEV ECO | 2              | 2      | 2        |

**COURSE OUTCOME**

1. Students will be able to develop a comprehensive perspective on the development issues confronted by Indian economy.
2. Students will be able to apply economic theories and concepts for understanding contemporary development issues.

**Module 1 Poverty in India:**

Poverty; meaning, absolute poverty and relative poverty, causes of poverty, poverty line, head count index, basic needs approach, capability approach. Extent, magnitude and inter-state comparison of poverty, poverty eradication measures in India since 1991.

**Module 2 Unemployment and Inequality in India:**

Unemployment; meaning, causes of unemployment, types of unemployment, NSSO classification of unemployment, extent and magnitude of unemployment, labour force participation rate, informalisation of labour, Inequality; meaning, causes of inequality, extent of inequality, inclusive growth.

**Books for Study**

- 1 Misra, S.K and V K Puri(2018): Indian Economy, Himalaya Publishing House.
- 2 Datt, Gaurav and Ashwani Mahajan(2016) Indian Economy, S. Chand and Sons.
- 3 Kapila, U. (Ed.). (2009). *Indian Economy since independence*. Academic Foundation.
- 4 Datt, Ruddar and K P M Sundaram(2017)Indian Economy, S. Chand and Sons.
- 5 Dhingra, I. C. (2013). *The Indian Economy: Environment and Policy*. Sultan Chand & Sons.
- 6 Agrawal, A. N. (2012). Indian Economy: Problems of Development and Planning.
- 7 Remesh Singh(2019) Indian Economy, McGraw Hill Private Ltd.

**Books for Reference**

- 1 Jalan, B. (2012). *Emerging India: Economics, Politics, and Reforms*. Penguin Books India.
- 2 Uma Kapila(2013)Two Decades of Economic Reforms in India: Towards Faster Sustainable and More Inclusive Growth, 3<sup>rd</sup> edition, Academic Foundation, New Delhi.
- 3 Kaushik Basu (2004) India's Emerging Economy: Performance and Prospects in the 1990s and Beyond, MITP Press.
- 4 Sen, A. (1982). *Poverty and Famines: An Essay on Entitlement and Deprivation*. OUP.

**GENERIC ELECTIVE COURSE 03:**  
**KERALA ECONOMY**

| SEMESTER | COURSE CODE          | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|----------------------|----------------|--------|----------|
| V        | 5D 03ECO/<br>DEV ECO | 2              | 2      | 2        |

**COURSE OUTCOMES**

1. Students will be able to understand the structural changes in Kerala Economy.
2. The course will provide the students a basic understanding about the developmental issues of Kerala Economy.

**Module-I Kerala in the National Economy**

Significant features of Kerala economy since state formation-Kerala as a developmental model: debates on the existence and sustainability of Kerala model. Sectoral composition of Kerala economy-developmental challenges faced by agriculture, industry and service sector, significance and growth of service sector: health, education, and banking, tourism, IT, transport - liberalization policies and its impact on service sector.

**Module II Developmental Issues in Kerala**

Demographic transition-aging population–Migration-inward and outward migration-Poverty-Unemployment-environmental issues, food security, energy crisis- Decentralized governance and its impact on Kerala economy- Fiscal crisis of Kerala.

**Books/Report for Study**

1. Government of Kerala (2019) Economic Review, Kerala State Planning Board, Thiruvananthapuram
2. Prakash, B. A. (1999). *Kerala's Economic Development: Issues and Problems*. Sage.

**Books for Reference**

1. George, K. K. (1999). *Limits to Kerala Model of Development: An Analysis of Fiscal Crisis and its Implications*. Centre for Development Studies.
2. Tharamangalam, J. (Ed.). (2006). *Kerala: The Paradoxes of Public Action and Development*. Orient Longman.
3. Harilal, K. N., & Joseph, K. J. (2003). Stagnation and Revival of Kerala economy: An Open Economy Perspective. *EPW*, 2286-2294.
4. Oommen M A (Ed. 1999), *Rethinking Development: Kerala's Experience*, vol.1 & II, New Delhi: Institute of social sciences.

## GENERIC ELECTIVE COURSE 04:

### FUNDAMENTALS OF BUDGET

| SEMESTER | COURSE CODE           | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-----------------------|----------------|--------|----------|
| V        | 5D 04 ECO/<br>DEV ECO | 2              | 2      | 2        |

#### COURSE OUTCOME

1. Students will get an idea about budget and the basic concepts, apart from budgetary procedures
2. Students will acquire basic knowledge about the sources of revenue and expenditure of govt.

#### **Module I. Budget**

Meaning and objectives of budget- Principles of budgeting - Budgetary procedure ( preparation of the budget, presentation of the budget in the parliament, execution of the budget and parliamentary control over the budget)- Balanced ,surplus and deficit budgets- Performance budget and Zero Based Budget- Consolidated fund and contingency fund- - Major deficit concepts (Revenue deficit, fiscal deficit, primary deficit)- Major highlights of the current year's Budget.

#### **Module II. Public expenditure and revenue**

**Public expenditure** – Meaning- classification (Revenue and capital expenditure, plan and non-plan expenditure), reasons for the growth of public expenditure in India.

**Public revenue** - Sources (Tax revenue and non-tax revenue)- Tax (meaning and features)- Direct and indirect taxes- progressive, proportional, regressive and digressive taxes- Tax evasion and tax avoidance – Finance commission and functions.

#### **Books for Study**

1. Jha, R. (1998), Modern Public Economics, Routledge, London
2. Mithani, D.M: Modern Public Finance: Theory and Practice
3. Musgrave, R.A. and P.B. Musgrave(1976) Public Finance in Theory and Practice, McGraw Hill
4. Rana, K.C & Varma, K.N: A Study in Public Finance.

#### **Books for Reference**

1. Hajela, T.N (2010): Public Finance, Ane Books
2. Herber, B.P. (1967) Modern Public Finance, Richard D. Irwin, Homewood.
3. Andley,K.K and K. P. M. Sundharam(1966) Public Finance and Public Economics: With Special Reference to Underdeveloped Countries, Ratan Prakashan Mandir,
4. Singh S K (2010): Public Finance: Theory and Practice, S Chand.

**GENERIC ELECTIVE COURSE 05:  
INDIAN ECONOMY IN THE POST REFORM PERIOD**

| <b>SEMESTER</b> | <b>COURSE CODE</b>           | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|------------------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5D 05ECO/<br/>DEV ECO</b> | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**COURSE OUTCOMES**

1. Students will be aware of the structural changes in the Indian economy during the post reform period.
2. Students will be equipped to evaluate the impact of the New Economic Policies on the various sectors of the economy.

**Module1: Introduction to Economic Reforms in India**

The background of economic reforms –The macroeconomic crisis in the beginning of 1990’s, Rationale for the economic reforms, Concepts of neoliberalism, globalization, liberalization and privatization etc

**Module 11: Review of Economic Reforms in India in the Last 25 years**

Performance of Indian economy: An evaluation based on GDP growth. Sectoral (Agriculture, industry and service) wise growth and share of each sector.–Agriculture sector reforms -New agricultural policy: Objectives and strategies; features WTO agreement. Impact of reforms on agriculture sector. Industry-New industrial policy: Objectives and strategies , Service Sector growth after reforms, Volume ,Composition and direction of trade in the reform period –Concepts of FDI and FPI .Impact of neo economic policies on status of poverty ,unemployment and inequality. Jobless growth and casualisation of labour. Inclusive growth policies: features and strategies.

**Books for Study**

1. Uma Kapila (2017) “Indian Economy: Performances and Policies” Academic Foundation, New Delhi.
2. Ruddar Dutt & KPM Sundaram (2013): Indian Economy; S.Chand & Co Ltd, New Delhi
3. Puri, V. K., & Misra, S. K. (2014). *Indian Economy-its Development Experience*. Himalaya Publishing House.

**Books for Reference**

1. Dhar, P. K. (2000). *Indian Economy: Its Growing Dimensions*. Kalyani Publishers.
2. Kapila, U. (Ed.). (2009). *India's Economic Development Since 1947*. Academic Foundation.

**CORE COURSE: MODEL QUESTION PAPER**  
**KANNUR UNIVERSITY**  
**B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**MICRO ECONOMIC ANALYSIS-I (Core Course)**  
**SEMESTER I**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part A**

**(Answer All Questions. Each Carries One Mark)**

1. What is economic theory?
2. State elasticity of Demand.
3. Define consumer surplus.
4. What is meant by substitution effect?
5. Define production function
6. Define market equilibrium

1x6=6

**Part B**

**(Answer Any Six Questions. Each Carries Two Marks)**

7. Distinguish between micro and macro economics.
8. What is expansion path?
9. What is water diamond paradox?
10. Explain linearly homogenous production function.
11. Briefly explain revealed preference theory of Samuelson.
12. Briefly explain the elasticity of supply.
13. State and explain the law of diminishing marginal utility.
14. Explain the Price Ceilings and Price Floors.

6x2=12

**Part C**

**(Answer Any Four Questions. Each Carries Three Marks)**

15. Distinguish between cardinal and ordinal utility approaches to consumer behavior.
16. Critically examine the Law of equi marginal utility.
17. Briefly explain the scope and subject matter of micro economics.
18. What is an indifference curve? Explain the properties of indifference curve.
19. Explain the Hicksian version of splitting up of price effect into income effect and substitution effect.
20. Explain producer equilibrium with the help of isoquant isocost analysis.

4x3=12

**Part D**

**(Answer Any Two Questions. Each Carries Five Marks)**

21. Explain consumer equilibrium with the help of ordinal analysis.
22. Explain the short run and long run cost curves in traditional and alternative approaches.
23. Explain elasticity of demand. Illustrate different types and methods of measurement of price elasticity of demand.
24. Explain economies and diseconomies of scale.

5x2=10

**KANNUR UNIVERSITY**  
**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**MICRO ECONOMIC ANALYSIS-II (Core Course)**  
**SEMESTER 1I**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part A**

**(Answer All Questions. Each Carries One Mark)**

1. Define price discrimination.
2. What is selling cost?
3. What is functional distribution?
4. Define quasi rent.
5. Distinguish between MRP and VMP
6. What is excess capacity?

1x6=6

**Part B**

**(Answer Any Six Questions. Each Carries Two Marks)**

7. Explain the types of monopoly.
8. Explain the features of perfect competition.
9. What is shut down point?
10. Explain subsistence theory of wages.
11. Distinguish between collusive and non collusive oligopoly.
12. Explain monopsony market.
13. Explain the degrees of price discrimination.
14. Explain price leadership

2x6=12

**Part C**

**(Answer Any Four Questions. Each Carries Three Marks)**

15. Explain the indeterminacy of price and output under bilateral monopoly.
16. Explain the product exhaustion theorem.
17. Explain briefly the Bertrand Model of duopoly.
18. Explain the necessary conditions and features of oligopoly.
19. Explain Keynesian theory of interest.
20. Examine group equilibrium under monopolistic competition?

3x4=12

**Part D**

**(Answer Any Two Questions. Each Carries Five Marks)**

21. Define monopoly. Explain price and output determination under short run and long run.
22. Explain marginal productivity theory of distribution
23. Briefly explain the Ricardian theory of rent
24. Explain price rigidity under oligopoly

5x2=10

**CORE COURSE: MODEL QUESTION PAPER**  
**B.A DEGREE EXAMINATION ECONOMICS**  
**CENTRAL THEMES IN INDIAN ECONOMY**  
**(SEMESTER III)**

Time: 3 Hours

Maximum Marks: 40

**Part A**

(Very short answer type questions) Answer all Questions

1. Work Participation Rate
2. NITI Ayog
3. Decentralized Planning
4. Concept of Poverty
5. Disguised unemployment
6. Demonetization

( 6 x 1 = 6 )

**Part B**

(Short answer type questions) Answer Any **SIX** Questions

7. Examine the causes of low productivity in Indian agriculture
8. Write a note on Agreement on Agriculture
9. What you mean by Ever Green Revolution
10. Examine the fiscal crisis in Kerala
11. Examine the role of Cottage and Small Scale industries in the growth of Indian economy
12. Explain the nature of Cropping Pattern in Kerala
13. State the New Economy Policy of 1991.
14. What is demographic Transition? Explain its different stages.

( 6 x 2 = 12 )

**Part C**

(Short Essay type questions) Answer Any **FOUR** Questions

15. Highlight Kerala's development in Social Sector.
16. Explain the importance of agriculture in Indian economy
17. Briefly explain the reasons of income inequalities in India
18. Examine the features of Kerala economy
19. Explain the role of small scale industries in India
20. Write a note on health sector in Kerala

( 4 x 3 = 12 )

**Part D**

(Essay type questions) Answer Any **TWO** Questions

21. Explain the pattern of Industrial development since Independence
22. Briefly explain the impact of WTO on Indian agriculture
23. Evaluate the Poverty Eradication Programmes after 1991.
24. Examine the Unemployment problem in Kerala

(5X2=10)



**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION –DEVELOPMENT ECONOMICS (CORE COURSE)**  
**3 B03 DEVECO: THEORIES OF ECONOMIC DEVELOPMENT**  
**SEMESTER III**

**Time: 3 hours**

**Max.Marks: 40**

**Part – A**

**(Very short answer type Questions. Answer all Questions)**

1. Define HDI
2. Define Human Capital formation
3. What is surplus value?
4. Explain stationary state
5. Define the term innovation
6. Explain the concept of take off

**(6x1=6marks)**

**Part – B**

**(Short answer type Questions- Answer any Six Questions)**

7. What is intermediate technology?
8. Explain the theory of demographic transition
9. Distinguish between backward linkages and forward linkages
10. What are the determinants of development?
11. What is the significance of gender development index?
12. Explain the core values of development
13. Differentiate between Women in Development (WID) and Women and Development (WAD)
14. What is organic composition of capital?

**(6x2=12Marks)**

**Part – C**

**(Short Essay type Questions-Answer any Four Questions)**

15. Explain Rostow's stages of growth
16. Explain Human Development Index. Compare recent trends in HDI in India and Kerala.
17. Explain the Unbalanced growth theory.
18. Explain Schumpeter's theory of economic development.
19. Discuss Leibenstein's Critical Minimum Effort Thesis
20. Explain advantages and disadvantages of inward looking and outward looking policies.

**(4x3=12**

**Marks)**

**Part – D**

**(Essay type Questions) Answer any Two Questions**

21. Critically Examine Lewis labour surplus theory of development
22. Explain the structure and characteristics of a developing economy
- 23) Critically evaluate Marxian theory of development?
- 24) Explain the relevance of Harrod Domar theory?

**(2x5=10 Marks)**

**CORE COURSE: MODEL QUESTION PAPER**  
**B.A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**INTERNATIONAL ECONOMICS**  
**(SEMESTER III)**

**Time: 3 Hours**

**Maximum: 40 marks**

**Part – A (Very short answer type Questions). Answer all Questions.**

1. What do you mean by BOP?
2. Define net barter terms of trade
3. Differentiate between international trade and inter-regional trade
4. What do you mean by free trade
5. Define Voluntary export restraints
6. Define export subsidies (1x6=6)

**Part – B (Short answer type Questions) Answer any SIX Questions**

7. What is reciprocal demand
8. What do you mean by non-tariff barriers
9. Define dumping
10. Write a short note on balance of trade
11. Critically illustrate the impact of foreign direct investment in India since globalization
12. Define terms of trade
13. Differentiate between current and capital account
14. What do you mean by optimum tariff (2x6=12)

**Part – C (Short Essay type Questions) Answer any FOUR Questions**

15. Critically evaluate the purchasing power parity theory
16. Explain the comparative cost theory
- 17 Give a brief account of foreign portfolio investment
- 18 Examine the impact of tariffs
19. Discuss the role of IMF in correcting BOP disequilibrium in member countries
20. Explain the opportunity cost theory. (3x4=12)

**Part-D (Essay type Questions) Answer any TWO Questions**

21. Critically evaluate the Heckscher- Ohlin trade theory
- 22 Discuss the role of WTO and other free trade agreements in promoting the foreign trade of India
23. What do you meant by balance of payment disequilibrium .Give a brief account of the important causes of the BOP disequilibrium and the measures to correct the disequilibrium?
24. Describe the different types of non-tariff barriers and its impact on the trade.

(5x2=10),

**MODEL QUESTION PAPER**  
**IV SEMESTER BA DEGREE EXAMINATION**  
**CORE COURSE IN ECONOMICS/DEVELOPMENT ECONOMICS**  
**RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS**

**Time: 2 Hours**

**Max. Marks: 30marks**

**Part A (Answer All Questions)**

1. What is hypothesis?
2. What are footnotes?
3. What is research? **(1X3=3)**

**Part B (Answer Any 5 Questions)**

4. Distinguish between bibliography and reference.
5. Distinguish between inductive and deductive method.
6. What are the criteria of good research?
7. Distinguish between questionnaire and schedule.
8. What are the major modes of referencing in research?
9. What are the functions of literature review?
10. Distinguish between census and sampling method. **(2x5=10)**

**Part C (Answer Any 4 Questions)**

11. Briefly explain the structure of research report.
12. What are the problems of research in social science?
13. Explain the structure of research report.
14. Explain the various steps involved in research process.
15. What are the ethical practices in social science research?
16. Briefly explain the steps involved in research process. **(3X4=12)**

**Part D (Answer Any One Question)**

17. Explain the various types of research methods.
18. What is plagiarism? Explain the various forms and consequences of plagiarism.

**(5X1=5)**

**KANNUR UNIVERSITY**  
**IV Semester B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**ENVIRONMENTAL ECONOMICS**

**Time: 3 Hours**

**Max. Marks: 40**

**Part - A**

**(Answer all questions. Each question carries 1 mark)**

1. Environmental economics.
2. Disaster management
- 3 E-waste
4. Externality
5. Vulnerability
6. Soil erosion

(1x6=6)

**Part - B**

**(Answer any 6 questions. Each question carries 2 marks.)**

7. How is a biocentrism different from anthropocentrism?
8. Explain the relationship between environment and economy
9. Differentiate between weak sustainability and strong sustainability
10. What is the significance of 'tragedy of Commons' in environmental economics?
11. Explain free rider problem
12. Distinguish between renewable and non-renewable resources.
13. Explain the important pollution control instruments.
14. What is resource taxonomy?

(2x6=12)

**Part - C**

**(Answer any 4 questions. Each question carries 3 marks.)**

15. Explain the material balance model.
16. What are the causes and effects of global warming?
17. Explain the need for conservation of natural resources
18. Explain Coase theorem
19. What are the causes for market failure in environmental economics?
20. Explain the nature and scope of environmental economics.

(3x4=12)

**Part - D**

**(Answer any 2 questions. Each question carries 5 marks.)**

- 21 Explain briefly the major environmental problems in Kerala.
22. Define Sustainable development. What are the indicators and obstacles of sustainable development.
23. What are the different types of disasters? Explain the importance and relevance of disaster management in the present environmental scenario.
24. Explain the market failure in the presence of externalities.

(5x2=10)

**MODEL QUESTION PAPER**  
**V SEMESTER B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**BASIC TOOLS FOR ECONOMIC ANALYSIS – I (CORE COURSE)**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part-A (Answer all questions. Each question carries 1 mark)**

1. Define G.P. with an example.
2. Distinguish between equal sets and equivalent sets.
3. Solve  $2x + 3 = 5$ .
4. Define standard deviation.
5. What is meant by skewness.
6. State the mathematical definition of probability. (1 x 6 = 6 marks)

**Part-B (Answer any six questions. Each question carries 2 marks)**

7. If the 7th and 12th terms of an A.P are 20 and 35. Find the series.
8. Find  $\log X$  if (i)  $X = 126 \times 256.4$  and (ii)  $X = 354 / 236.2$
9. Draw the graph of  $Y = 5X + 4$ .
10. Distinguish between primary and secondary data.
11. What are the major parts of a table?
12. Explain Lorenz curve.
13. Compute the quartile deviation and inter quartile range for the following values :  
7, 85, 25, 60, 5, 10, 74, 12, 16, 10.
14. Given A, B, C are independent events and  $P(A) = 0.3$ ,  $P(B) = 0.2$  and  $P(C) = 0.4$ . Find the probability for (a) all occurring (b) none occurring (c) at least one occurring and (d) exactly one occurring.

(2 x 6 = 12 marks)

**Part-C (Answer any four questions. Each question carries 3 marks)**

15. Explain the laws of indices.
16. Explain the set operations with suitable examples.
17. A company sells X tins of talcum powder each day at Rs. 30 a tin. The cost of manufacturing and selling these tins is Rs. 20 per tin plus a fixed daily overhead cost of Rs. 1,000. Determine (i) cost function (ii) revenue function and (iii) profit function. What are the total cost, total revenue and total profit when 1000 tins are manufactured and sold a day ? What is the average cost when 10 units are produced ?
18. Briefly explain the different methods of sampling.
19. Define conditional probability and the independence of events.
20. Calculate mean deviation about median from the following data.

|                 |         |         |         |         |         |         |         |
|-----------------|---------|---------|---------|---------|---------|---------|---------|
| Marks           | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 | 70 - 80 |
| No. of students | 4       | 6       | 10      | 20      | 10      | 6       | 4       |

(3 x 4 = 12 marks)

**Part-D (Answer any two questions. Each question carries 5 marks)**

**21.** Calculate median and mode from the following data.

| Wages(in Rs.) | No. of workers |
|---------------|----------------|
| 15 - 19       | 31             |
| 20 - 24       | 47             |
| 25 - 29       | 59             |
| 30 - 34       | 78             |
| 35 - 39       | 104            |
| 40 - 44       | 113            |
| 45 - 49       | 81             |
| 50 - 54       | 60             |
| 55 - 59       | 52             |
| 60 - 64       | 25             |

**22.** Calculate coefficient of variation for the following data.

| Marks   | No. of students |
|---------|-----------------|
| 20 - 29 | 5               |
| 30 - 39 | 12              |
| 40 - 49 | 15              |
| 50 - 59 | 20              |
| 60 - 69 | 18              |
| 70 - 79 | 10              |
| 80 - 89 | 6               |
| 90 - 99 | 4               |

**23.** Explain the methods of collecting primary data.

**24.** Explain the addition and multiplication rules of probability. Give suitable examples.  
(5 x 2 =10 marks)

**CORE COURSE: MODEL QUESTION PAPER**  
**V SEMESTER B.A DEGREE EXAMINATION-2019**  
**ECONOMICS / DEVELOPMENT ECONOMICS**  
**HETERODOX ECONOMICS**

**Time: 3 Hours**

**Maximum: 40 marks**

**PART-A**

(Answer **all** questions. Each question carries **1** mark)

1. Heterodox economics
2. Neo-classical economics
3. Organic Composition of Capital
4. Materialistic Interpretation of History
5. Neuro economics
6. Innovation (1x6=6)

**PART-B**

(Answer any **Six** questions. Each question carries **2** marks)

7. Features of institutionalism
8. Labour theory of value.
9. Behavioural economics.
10. Mode of production
11. Immiserisation of the proletariat
12. Feminist economics
13. Concentration and centralization of capital.
14. Distinguish between C-M-C and M-C-M<sup>1</sup> (2x6=12)

**PART-C**

(Answer any **four** questions. Each question carries **3** marks)

15. State the basic features of mainstream economics
16. Write a short on ecological economics.
17. Examine the relevance of Marxian economics in the modern era.
18. Explain the main ideas of Thorestein Veblen
19. What is trusteeship doctrine?
20. Explain how under consumption leads to capitalist crisis. (3x4=12)

**PART-D**

(Answer any **two** questions. Each question carries **five** marks)

21. What is heterodox economics? Explain its nature and scope
22. Give an account of Marxian economic ideas.
23. Do you think that Gandhian economics is an alternative to mainstream economics?
24. Compare and contrast heterodoxy and orthodoxy in economics. (5x2=10)

**CORE COURSE: MODEL QUESTION PAPER**  
**FIFTH SEMESTER BA DEGREE EXAMINATION**  
**CORE COURSE IN ECONOMICS / DEVELOPMENT ECONOMICS**  
**MACROECONOMICS ANALYSIS I**

**Time: 3 Hours**

**Maximum: 40 marks**

**Part A - Short answer**

**Answer all questions**

1. State Say's Law of Markets
2. What is a flow variable?
3. What do you mean by a Laissez – faire Economy?
4. Define Involuntary Unemployment.
5. What is Liquidity trap?
6. State Demonstration effect. (6 x 1 = 6)

**Part B - Short Essay**

*Answer any 6 questions*

7. Distinguish between Laissez – Faire and State intervention ideologies.
8. What do you mean by Monetarism?
9. State the major postulates of Classical economics
10. State the Quantity theory of Money
11. Distinguish between autonomous and induced consumption.
12. Why the value of Balanced Budget multiplier is always one?
13. What is the relationship between MPC and Investment multiplier?
14. State the concept of Accelerator. (6× 2 =12)

**Part C - Essay**

*Answer any 4 questions*

15. Write a brief note on the evolution of Macroeconomics.
16. Elucidate the saving – investment equality of Classical Economics.
17. Briefly explain Keynesian concept of Underemployment equilibrium.
18. Distinguish between permanent and transitory concepts of Income and Consumption.
19. Show the working of investment multiplier with the help of an example.
20. Briefly explain the Absolute Income Hypothesis. (4 × 3 =12)

**Part D - Long Essay**

*Answer any 2 questions*

21. Examine the criticisms leveled against the Classical Economics by J M Keynes.
22. Illustrate the determination of Income in two, three and four sector economies under Keynesian Economics.
23. Distinguish between Inflationary gap and Deflationary gap. Suggest remedies to solve these instabilities.
24. Explain the major Post-Keynesian theories of Consumption.

(2 × 5 =10)



**MODEL QUESTION PAPER**  
**V SEMESTER B A DEGREE EXAMINATION-ECONOMICS**  
**(5B10 ECO)**  
**DEVELOPMENT ECONOMICS**  
**(CORE COURSE)**

**Time: 3 hours**

**Maximum marks: 40**

**Part – A**

**(Very short answer type Questions- Answer all Questions)**

- 1) Define development economics?
- 2) Define Human poverty index?
- 3) What do you mean by structural unemployment?
- 4) What is development gap?
- 5) Define the term innovation
- 6) Explain the concept of take off (6x1=6marks)

**Part – B**

**(Short answer type Questions- Answer any Six Questions)**

- 7) What is the significance of gender development index?
- 8) Explain the idea of capability by Amartya Sen
- 9) Explain the core values of development
- 10) Define the term Solow residual?
- 11) Distinguish between natural growth rate and warranted growth rate?
- 12) What are the characteristic features of traditional society according to Rostow?
- 13) What is organic composition of capital?
- 14) Distinguish between endogenous and exogenous growth models.

**(6x2=12Marks)**

**Part – C**

**(Short Essay type Questions-Answer any Four Questions)**

- 15) Define unemployment. What are the types of unemployment?
- 16) Differentiate between Growth and development?
- 17) Summarize the neo classical theory of growth by Solow?
- 18) Explain theory of unlimited supply of labour?
- 19) Differentiate between balanced growth and unbalanced growth
- 20) What is the essence of big push theory by Rosenstein-Rodan?

**(4x3=12 Marks)**

**Part – D**

**(Essay type Questions-Answer any Two Questions)**

- 21) Critically evaluate Marxian theory of development?
- 22) Explain the relevance of Harrod- Domar theory?
- 23) Analyse the contributions of Schumpeter to development economics in the light of Innovation theory?
- 24) Explain the measurement of growth and development and limitations of various measures.

**(2x5=10 Marks)**

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2019**  
**DEVELOPMENT ECONOMICS (CORE COURSE)**  
**5B10 DEV ECO: DEVELOPMENT PLANNING: TOOLS AND TECHNIQUES**  
**SEMESTER V**

**Time: 3hours**

**Maximum Marks: 40**

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. Define economic planning
2. Explain the concept of plan models
3. What do you understand by rolling planning?
4. Explain disguised unemployment
5. Write a note on club of Rome
6. Define peoples planning

**(6x1=6marks)**

**Part B**

**(Answer any 6 questions -Each question carries 2 marks)**

7. What is meant by sustainable development?
8. Explain the term physical planning
9. What do you mean by investment criteria?
10. Explain economic controls
11. What do you understand by the term linear programming
12. Explain the concept of perspective planning
13. Role of shadow prices in economic planning
14. Explain the limitations of planning in India

**(6x2=12**

**Marks)**

**Part C**

**(Answer any 4 questions -Each question carries 3 marks)**

15. Explain the concept of cost-benefit analysis
16. Explain some anti-poverty programs implemented in India
17. Explain the concept of democratic planning
18. Explain advantages and disadvantages of capital intensive technology
19. Explain the objectives and strategies of 12<sup>th</sup> five year plan
20. Explain a short note on Earth Summit at Rio De Janeiro and Recent Developments.

**(4x3=12 Marks)**

**Part D**

**(Answer any 2 questions -Each question carries 5 marks)**

20. Discuss the merits and demerits of major investment criteria.
21. Explain the salient features of planning in India and state its objectives and strategies.
22. Explain the problems and policies of sustainable development
23. Evaluate the sustainability of Kerala model of development and point out emerging challenges

**(2x5=10 Marks)**

**MODEL QUESTION PAPER**  
**ECONOMICS/ DEVELOPMENT ECONOMICS**  
**V SEMESTER B A DEGREE EXAMINATION**  
**ECONOMICS OF BANKING AND FINANCE**

**Time: 3 Hours**

**Maximum: 40 Marks**

**PART-A**

(Answer **all** questions. Each question carries **1** mark)

- 1 What is financial system?
- 2 What is SIDBI?
- 3 What is ATM?
- 4 What is call money market?
- 5 What is reverse repo?
- 6 What is IRDAI? (1x6=6)

**PART-B**

(Answer any **Six** questions. Each question carries **2** marks)

- 7 Distinguish between debit card and credit card?
- 8 What is Treasury bill?
- 9 Write a note on commercial paper.
- 10 What is NBFC?
- 11 Distinguish between primary market and secondary market?
- 12 What are futures?
- 13 Write a note on PFRDA.
- 14 List out the major objectives of SEBI? (2x6=12)

**PART-C**

(Answer any **four** questions. Each question carries **3** marks)

- 15 What are the functions of the commercial banks?
- 16 Explain the term money market. State the main features of Indian money market.
- 17 What are the functions of IDBI?
- 18 Explain the principles of sound lending.
- 19 Examine the role of NABARD in rural credit.
- 20 Discuss the various kinds of financial derivatives. (3x4=12)

**PART-D**

(Answer any **two** questions. Each question carries **five** marks)

- 21 Explain the different components of Indian financial system?
- 22 Explain the innovations and recent trends in commercial banking in India.
- 23 Explain briefly the banking sector reforms in India.
- 24 Critically examine the role of RBI and SEBI in regulating Indian financial system. (5x2=10)

**MODEL QUESTION PAPER**  
**VI SEMESTER B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**BASIC TOOLS FOR ECONOMIC ANALYSIS – II**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part-A (Answer all questions. Each question carries 1 mark)**

1. Define a lower triangular matrix with an example.
2. Define limit of a function.
3. Define positive and negative correlations with examples.
4. Define simple linear regression.
5. Define secular trend.
6. What is time reversal test? (1 x 6 = 6 marks)

**Part-B (Answer any six questions. Each question carries 2 marks)**

7. Test whether the matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & 6 & 9 \\ 2 & 4 & 6 \end{bmatrix} \text{ is singular or non-singular.}$$

8. Write the relationship among AR, MR and elasticity.
9. Find the marginal cost and average cost from the total cost function  
 $C = 60 + 10x + 15x^2$ .
10. Define derivative of a function.
11. Explain scatter diagram method of studying correlation.
12. If the two regression coefficients are  $-0.4$  and  $-0.9$ , what is the correlation coefficient?
13. Define maxima and minima of a function.
14. Explain Fisher's index number and its importance.

(2 x 6 = 12 marks)

**Part-C (Answer any four questions. Each question carries 3 marks)**

15. Show that  $A^3 + 4A^2 - A - 12I = 0$  when

$$A = \begin{bmatrix} 0 & 1 & 2 \\ 2 & -3 & 0 \\ 1 & 1 & -1 \end{bmatrix}$$

16. Explain the rules of differentiation.
17. From the following data fit a regression line of X on Y

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| X | 5 | 6 | 7 | 3 | 2 |
| Y | 4 | 5 | 8 | 2 | 1 |

18. Explain Karl Pearson's correlation coefficient. What are the merits and demerits?

19. Calculate seasonal indices from the following data by the method of simple averages.

| Season | 1972 | 1973 | 1974 | 1975 |
|--------|------|------|------|------|
| I      | 75   | 86   | 90   | 100  |
| II     | 60   | 65   | 72   | 78   |
| III    | 54   | 63   | 66   | 72   |
| IV     | 59   | 80   | 85   | 93   |

20. Explain the construction of consumer price index numbers.

(3 x 4 =12 marks)

**Part-D (Answer any two questions. Each question carries 5 marks)**

21. Solve the system of equations using Cramer's rule :

$$5x - 6y + 4z = 15,$$

$$7x + 4y - 3z = 19,$$

$$2x + y + 6z = 46.$$

22. Calculate Karl Pearson's correlation coefficient for the following data

|   |    |   |   |    |    |    |    |   |
|---|----|---|---|----|----|----|----|---|
| X | 10 | 6 | 9 | 10 | 12 | 13 | 11 | 9 |
| Y | 9  | 4 | 6 | 9  | 11 | 13 | 8  | 4 |

23. Explain the components of time series.

24. Compute Laspeyre's, Paasche's and Fisher's price index from the following data.

| Commodities | 2004  |          | 2005  |          |
|-------------|-------|----------|-------|----------|
|             | Price | Quantity | Price | Quantity |
| A           | 2     | 8        | 4     | 6        |
| B           | 5     | 10       | 6     | 5        |
| C           | 4     | 14       | 5     | 10       |
| D           | 2     | 19       | 2     | 13       |

(5 x 2 =10 marks)

**MODEL QUESTION PAPER**  
**SIXTH SEMESTER BA DEGREE EXAMINATION**  
**CORE COURSE IN ECONOMICS/ DEVELOPMENT ECONOMICS**  
**MACROECONOMIC ANALYSIS II**

**Time: 3 Hours**

**Maximum: 40 Marks**

**Part A - Short answer**

**Answer all questions**

1. Define IS-LM
2. What would happen to IS if saving increases?
3. What is Demand pull inflation?
4. Define Natural rate of Unemployment.
5. What do you mean by Juglar cycle?
6. Define seigniorage. (6 x 1 = 6)

**Part B - Short Essay**

**Answer any 6 questions**

7. Show the shifts in general equilibrium due to the increase in demand for money using IS-LM framework.
8. Write a note on Cost push inflation.
9. List out two limitations of IS-LM.
10. What do you mean by Adaptive Expectation?
11. What is Barter system?
12. Which are the Income motives of demand for money?
13. Distinguish between Depression and Prosperity.
14. Distinguish between inside money and outside money. (6X 2 =12)

**Part C - Essay**

**Answer any 4 questions**

15. Show important shifts in IS and LM and the resultant changes in general equilibrium.
16. Distinguish between Short run and Long run Philips curves.
- 17 Explain the Monetary theory of trade cycles.
18. Examine the Neoclassical synthesis.
19. What are the important measures of money supply in India? Explain.
20. What do you mean by Fischer Effect? (4 X 3=12)

**Part D - Long Essay**

**Answer any 2 questions**

21. Illustrate the integration of Real and Monetary sectors and General equilibrium through IS-LM framework.
22. Examine the important monetary and fiscal weapons to combat Inflation and Unemployment.
23. Compare and contrast between Keynesian and Hayek's theories of trade cycles.
24. Illustrate the Keynesian theory of demand for money. (2 × 5=10)

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**PUBLIC ECONOMICS (CORE COURSE)**

**SEMESTER VI**

Time: 3hours

Maximum marks 40

**Part – A**

(Short answer type questions. Answer all questions. Each carries one mark)

- 1) Private good
- 2) Progressive Tax
- 3) Budget
- 4) Escheats.
5. Sinking Fund
6. Tax incidence

(6X 1=6)

**Part – B**

(Short essay type questions. Answer any **SIX** questions. Each carries two marks)

- 7) Explain externalities.
- 8) Describe zero-based budgeting
- 9) Distinguish between developmental and non-developmental expenditure
- 10) Describe the characteristics of public good.
- 11) Distinguish between vertical and horizontal imbalance.
- 12) Analyse the trends in public expenditure in India.
- 13) List the features of tax.
- 14) Explain the major highlights of current year's budget

(6 X 2=12)

**Part – C**

(Essay type questions. Answer any **FOUR** questions. Each carries **three** marks)

- 15) Describe the fiscal functions of government.
- 16) Explain the features of GST implemented in India
- 17) State the canons of public taxation.
- 18) Define deficit financing. What are the methods of deficit financing?
- 19) Critically examine the principle of maximum social advantage.
- 20). Explain the methods of repayment of public debt.

(4 X 3=12)

**Part – D**

(Long essay type questions. Answer any **TWO** questions. Each carries **five** marks)

- 21) Define public economics. Explain the scope and subject matter of public economics.
- 22) Explain the sources of public revenue.
- 23) Briefly explain the major theories of Public expenditure. Examine the reasons for the growth of public expenditure in India.
- 24) Critically examine the functions of finance commission. What are the major recommendations of latest finance commission?

(2 X 5=10)

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**BASIC ECONOMETRIC ANALYSIS**  
**SEMESTER VI**

**Time: 3 Hours**

**Maximum Marks: 40**

**Part-A (Answer all questions. Each question carries 1 mark)**

1. Define Econometrics.
2. What is BLUE?
3. Distinguish between Endogenous and Exogenous variables.
4. Distinguish between Population regression function and Sample regression function.
5. What is Panel data?
6. Define Applied Econometrics (1X6=6)

**Part-B (Answer any six questions. Each question carries 2 marks)**

7. What is the meaning of 'linear in parameters'?
8. Justify the use of random error term in a regression model.
9. Distinguish between time series data and cross section data.
10. Distinguish between statistical model and econometric model.
11. Explain the concept of Null Hypothesis and Alternative Hypothesis.
12. What are the causes of Autocorrelation?
13. What are the desirable properties of good econometric model?
14. What is the classic symptom of Multicollinearity? (2X6=12)

**Part-C (Answer any four questions. Each question carries 3 marks)**

15. State the Stochastic assumptions of OLS.
16. Explain Coefficient of determination.
17. Explain Durbin-Watson test for Autocorrelation.
18. Explain any two methods to overcome the problem of Heteroscedasticity.
19. What is meant by non- linear regression model?
20. What are the important goals of Econometrics? (3X4=12)

**Part-D (Answer any two questions. Each question carries 5 marks)**

21. Briefly explain the meaning and scope of Econometrics and point out its limitations.
22. Discuss the Methodology of Econometrics.
23. Explain in detail Gauss Markov theorem.
24. Briefly explain the detection and remedial measures of Multicollinearity. (5X2=10)



**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**MATHEMATICS FOR ECONOMIC ANALYSIS-I (COMPLEMENTARY COURSE)**  
**SEMESTER I**

**Time: 3 Hours**

**Max. Marks: 40**

**Part - A**

**(Answer all the 6 Questions. Each carries 1 Mark)**

1. Define the following: a) Single valued function b) Single variable function
2. If  $D = 100 - 2p$ , find the demand for free good
3. Derive the slope of function  $ax + by + c = 0$ .
4. Find the elasticity of demand for the demand function  $q = 27/p^3$
5. Define function.
6. Define continuity of a function at a point.

**(6x1=6 Marks)**

**Part - B**

**(Answer any 6 questions. Each carries 2 Marks)**

7. Derive the slope of function  $ax + by + c = 0$ .
8. Find the differential coefficient of  $xy + y^2 = 4$
9. Differentiate convex and concave function.
10. Differentiate partial and total derivatives.
11. Differentiate  $x^x$ .
12. Criterion for minimum value of a function.
13. Find  $d^2 z$  if  $z = \sqrt{x + y}$
14. What is mean by constraint optimization? **(6x2=12Marks)**

**Part - C**

**(Answer any 4 questions. Each carries 3 Marks)**

15. Explain briefly different types of functions.
16. Draw the graph of  $x^2 = 4y$ .
17. When do you say  $y = f(x)$  is continuous in the interval  $(a, b)$ .
18. Define Lagrange multiplier
19. If  $y = 3x^3 - 2x^2 + 6x$ , find  $d^4 y/dx^4$ .
20. Using L 'Hospital's rules evaluate  $\lim_{x \rightarrow 2} \frac{x^2 - 5x + 6}{x^2 - 4}$

**(4x3=12 Marks)**

**Part - D**

**(Answer any 2 questions. Each carries 5 Marks)**

21. Define elasticity. If the demand law is  $p = 20/q - 1$ , find elasticity of demand with respect to price at the point where  $q = 3$ .
22. For the production function,  $16y^2 - y + 2(K - 4)^2 + 4(L - 5)^2 - 80 = 0$  find marginal productivities.
23. State Euler's theorem and hence properties of homogenous functions. Verify Euler's theorem for the following function  $u = 3x^2 + 2xy + y^2$
24. Explain the application of derivatives in economics. **(5x2=10 Marks)**

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2019**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**MATHEMATICS FOR ECONOMIC ANALYSIS-II (COMPLEMENTARY COURSE)**  
**SEMESTER I**

**Time: 3 Hours**

**Max. Marks: 40**

**Part - A**

**(Answer all the 6 Questions. Each carries 1 Mark)**

1. Define singular matrix
2. Solve  $\int (x^3 + 1/x) dx$ .
3. Explain trace of a matrix
4. Define the order of a matrix
5. Differentiate between diagonal and non-diagonal matrix
6. Define cofactor matrix

**(6x1=6 Marks)**

**Part – B**

**(Answer any 6 questions. Each carries 2 Marks)**

7. Define Eigen value.
8. Differentiate consumer's surplus with producer's surplus.
9. What is the relationship between total and marginal values in economics?
10. Differentiate symmetric and skew symmetric matrix.
11. Mention any two properties of determinants.
12. What is the present value of a perpetual cash flow of Rs.1, 450 per year discounted at  $v = 5\%$ ?
13. Integrate  $e^x - 1/x$ .
14. Marginal Revenue function is given as  $100 - 8q$ . Calculate Total Revenue when  $q = 14$ . explain gauss elimination method

**(6x2=12 Marks)**

**Part – C**

**(Answer any 4 questions. Each carries 3 Marks)**

15. Is it possible for a matrix to be its own inverse?
16. Integrate  $(x^2 \cdot e^x) dx$ .
17. Find the rank of matrix A if  $A = \begin{pmatrix} 1 & 4 & 0 \\ 2 & 5 & 0 \\ 3 & 6 & 0 \end{pmatrix}$
18. Write the Lagrangian function for  $U = (x+2)(y+1)$  and  $P_x = 4$ ,  $P_y = 6$  and  $B = 130$  and find the optimal level of purchase  $x^*$  and  $y^*$ .
19. If Marginal Cost of a firm is given by  $MC = 3q^2 - 4q + 5$ , find out TC given that fixed cost is Rs. 100.
20. Evaluate  $\begin{vmatrix} 1 & 2 & 5 \\ 2 & 3 & 1 \\ -1 & 1 & 1 \end{vmatrix}$

**(4x3=12 Marks)**

**Part – D**

**(Answer any 2 questions. Each carries 5 Marks)**

21. Using Cramer's rule, solve:  $4x + 3y - 2z = 1$ ,  $x + 2y = 6$ ,  $3x + z = 4$
22. Explain the basic properties of definite Integrals.
23. Find the consumers surplus and producers surplus for the demand curve  $d(x) = 16 - x^2$  and supply curve  $s(x) = 4 + x$ .
25. If  $MR = 16 - x^2$ . Find the maximum total revenue also find AR and demand function

**(2x5=10 Marks)**

**MODEL QUESTION PAPER**  
**BA DEGREE EXAMINATION**  
**ECONOMICS / DEVELOPMENT ECONOMICS**  
**MATHEMATICAL ECONOMICS – I (COMPLEMENTARY COURSE)**  
**SEMESTER - III**

**Time: 3 Hours**

**Max. Marks: 40**

**Part - A**

(Short answer type questions. Answer all questions. Each carries one mark)

1. Define cross elasticity of demand
2. Describe Cardinal utility
3. Define discriminating monopoly
4. If the price of the commodity is Rs.10 and marginal revenue is Rs.20, price elasticity of demand is .....
5. Given the total revenue function,  $R = 50x - 3x^2$ , marginal revenue function is.....
6. If  $TR = 20x$  and  $TC = 5x + 2$ , then profit function is ..... (6 x 1 = 6)

**Part - B**

(Short essay type questions. Answer any **SIX** questions. Each carries two marks)

7. Distinguish between ordinary demand function and compensated demand function.
8. Explain homogeneous and homothetic utility functions.
9. State the first and second order conditions for profit maximisation of a firm under perfect competition.
10. Explain the properties of indifference curves.
11. Find price elasticity of demand for the demand function  $Q = 1400 - P^2$  at  $P = 20$
12. Find marginal cost and average cost for the total cost function  $TC = 3Q^2 + 7Q + 12$  at  $Q = 3$ .
13. Let the demand function for a commodity be  $P = 25 - 9x$ , where  $P$  is the price and 'x' is the quantity demanded, find marginal revenue.
14. Find equilibrium price for a commodity when demand and supply functions are  $Q_d = 25p - 20$  and  $Q_s = 5p + 80$  respectively. (6 x 2 = 12)

**Part - C**

(Essay type questions. Answer any **FOUR** questions. Each carries **three** marks)

15. Explain the role of mathematics in economics.
16. Find out consumer's equilibrium level of consumption of commodity x and y, given the utility function,  $U = f(x, y)$ ,  $P_1 = \text{Rs.}5$ ,  $P_2 = \text{Rs.}5$  and consumers money income,  $M = \text{Rs.}50$ .
17. Explain the mathematical relationship between AR, MR and Price elasticity of demand.
18. Given  $Q_1 = 50 - 4P_1 - 3P_2 + 2P_3 + 0.001Y$ . At  $P_1 = 5$ ,  $P_2 = 7$ ,  $P_3 = 3$ ,  $Y = 11000$  and  $Q_1 = 26$  use cross elasticity to determine the relationship between good 1 and the other two goods.
19. Evaluate the elasticity of substitution of production function,  $Q = A[\alpha K^{-\beta} + (1-\alpha)L^{-\beta}]^{-1/\beta}$
20. For a firm under perfect competition, the demand function is given as  $P = 100 - 0.01Q$  where  $Q$  is weekly production. The cost curve is given by  $C = 50Q + 30,000$ . Calculate equilibrium price and quantity. (4 x 3 = 12)

**Part - D**

(Long essay type questions. Answer any **TWO** questions. Each carries **five** marks)

21. Explain the constraint utility maximisation.
22. Derive Slutsky equation and interpret the results.
23. Explain the properties of Cobb-Douglas Production function.
24. A producer has the possibility of discriminating between domestic and foreign markets for a product where the demand functions are  $Q_1 = 21 - 0.1P_1$  and  $Q_2 = 50 - 0.4P_2$ . Given the total cost function,  $TC = 2000 + 10Q$  where,  $Q = Q_1 + Q_2$  what price the producer will charge in order to maximise profit with discrimination between markets and without discrimination. (2 x 5 = 10)

**MODEL QUESTION PAPER**  
**BA DEGREE EXAMINATION**  
**ECONOMICS / DEVELOPMENT ECONOMICS**  
**MATHEMATICAL ECONOMICS – II (COMPLEMENTARY COURSE)**  
**SEMESTER - IV**

Time: 3 Hours

Max. Marks: 40

**Part - A**

(Short answer type questions. Answer all questions. Each carries one mark)

1. Define objective function of a linear programming problem.
2. Write a note on input output table.
3. Define payoff of a game.
4. ----- are the mirror image problems of primal linear programming problems.
5. The open static input output model was developed by -----
6. When pay-off of one player is equal to the loss of another, the game is called----- game.  
( 6 x 1 = 6)

**Part - B**

(Short essay type questions. Answer any **SIX** questions. Each carries two marks)

7. Explain technical constraints and optimal solution in linear programming.
8. Distinguish between slack and surplus variables.
9. State any four applications of linear programming.
10. Explain Technological matrix.
11. Distinguish between open and closed input output table.
12. Describe two person zero sum game
13. Explain Maximin and Minimax strategy of a game theory
14. Explain the concept of Nash equilibrium. (6x 2 = 12)

**Part - C**

(Essay type questions. Answer any **FOUR** questions. Each carries **three** marks)

15. Write down the dual of the following linear programming problem.  
 Minimize,  $Z = 6X_1 + 4X_2 + X_3$   
 Sub. to,  $X_1 + X_2 \leq 10$   
 $3X_1 + X_2 + X_3 \geq 23$   
 $7X_1 - X_3 \geq 6$   
 $X_1, X_2, X_3 \geq 0$
16. State the Hawkins-Simon Conditions for viability of an input-output system. Given the technological coefficient matrix,  $A = \begin{bmatrix} 0.2 & 0.4 \\ 0.3 & 0.5 \end{bmatrix}$ , verify this system is viable or not .
17. The technological matrix of a two sectors, X and Y is given by  $A = \begin{bmatrix} 0.3 & 0.3 \\ 0.4 & 0.6 \end{bmatrix}$ . If the final demand of the two sectors are 10 and 40 respectively, find the gross output of the two sectors.
18. What is meant by Saddle point in game theory. From the following pay off matrix, find the optimal strategies for both players and the saddle point.

|          |                                                                       |  |  |
|----------|-----------------------------------------------------------------------|--|--|
|          | Player B                                                              |  |  |
| Player A | $\begin{bmatrix} 15 & 2 & 3 \\ 6 & 5 & 7 \\ -7 & 4 & 0 \end{bmatrix}$ |  |  |

19. Solve the following game by Principle of dominance.

|          |                                                                                          |  |  |  |
|----------|------------------------------------------------------------------------------------------|--|--|--|
|          | Player B                                                                                 |  |  |  |
| Player A | $\begin{bmatrix} 8 & 10 & 9 & 14 \\ 10 & 11 & 8 & 12 \\ 13 & 12 & 14 & 13 \end{bmatrix}$ |  |  |  |

20. Explain Prisoner's Dilemma in game theory. ( 4 x 3 = 12 )

**Part - D**

(Long essay type questions. Answer any **TWO** questions. Each carries **five** marks)

21. Solve the following linear programming problem by graphic method.

$$\begin{aligned} \text{Maximise, } Z &= 24X_1 + X_2 \\ \text{Subject to, } 4X_1 + X_2 &\leq 20 \\ 2X_1 + 5X_2 &\leq 40 \\ 10X_1 + 5X_2 &\leq 60 \\ X_1, X_2 &\geq 0 \end{aligned}$$

22. Solve the following LPP problem using Simplex method.

$$\begin{aligned} \text{Maximise, } Z &= 5X_1 + 3X_2 \\ \text{Subject to, } X_1 + X_2 &\leq 2 \\ 5X_1 + 2X_2 &\leq 10 \\ 3X_1 + 8X_2 &\leq 12 \\ X_1, X_2 &\geq 0 \end{aligned}$$

23. Given the technology matrix A and final demand vector F, find the gross output of the three sectors.

$$A = \begin{bmatrix} 0.3 & 0.4 & 0.1 \\ 0.5 & 0.2 & 0.6 \\ 0.1 & 0.3 & 0.1 \end{bmatrix} \quad F = \begin{bmatrix} 20 \\ 10 \\ 30 \end{bmatrix}$$

24. Solve the following game problem graphically.

$$\begin{array}{c} \text{Player B} \\ \text{Player A} \end{array} \begin{bmatrix} 2 & -4 & 6 & -3 & 5 \\ -3 & 4 & -4 & 1 & 0 \end{bmatrix} \quad (2 \times 5 = 10)$$

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS**  
**INTRODUCTORY ECONOMICS-I (COMPLEMENTARY COURSE)**  
**SEMESTER I**

**Time: 3 hours**

**Maximum marks: 40**

**Part – A**

**Answer all Questions. Each Carries One Mark**

- 1) Define Economics.
- 2) Distinguish between cardinal and ordinal utility?
- 3) Concept of quasi rent.
- 4) What is selling cost?
- 5) Distinguish between micro and macro economics?
- 6) Define production function

1x6=6

**Part – B**

**Answer any Six Questions. Each Carries Two Marks**

- 7) What are the features of perfect competition?
- 8) Distinguish between price elasticity and cross elasticity of demand?
- 9) What is production possibility curve?
- 10) Define consumer surplus.
- 11) What do you mean by product differentiation?
- 12) Differentiate between expansion and contraction of demand.
- 13) What is the relation between average cost and marginal cost?
- 14) Explain the central problems of the economy.

2x6=12

**Part – C**

**Answer any Four Questions. Each Carries Three Marks**

- 15) What are the properties of an indifference curve?
- 16) Discuss about the functions and limitations of price mechanism?
- 17) Define elasticity of demand .what are the different degrees of elasticity of demand?
- 18) State the law of demand. What are its exceptions?
- 19) State law of variable proportion?
- 20) Explain consumer surplus.

3x4=12

**Part – D**

**Answer any Two Questions. Each Carries Five Marks**

- 21) Critically examine marginal productivity theory of distribution?
- 22) How price and output is determined under monopolistic competition in the long run?
- 23) Explain various definitions of economics
- 24) What is production? Explain the short run and long run laws of production?

2x5=10

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS**  
**INTRODUCTORY ECONOMICS-II (COMPLEMENTARY COURSE)**  
**SEMESTER II**

**Time: 3 hours**

**Maximum marks: 40**

**Part – A**

**Answer all Questions. Each Carries One Mark**

- 1) Distinguish between CRR and SLR?
- 2) Define public debt
- 3) What is GNP?
- 4) Define money.
- 5) What is an open market operation?
- 6) Define poverty.

1x6=6

**Part – B**

**Answer any Six Questions. Each Carries Two Marks**

- 7) Distinguish between absolute poverty and relative poverty.
- 8) What are non tax revenue items?
- 9) Distinguish between repo and reverse repo rate
- 10) What is moral suasion?
- 11) Explain decentralized planning in Kerala.
- 12) What is disguised unemployment?
- 13) Distinguish between surplus budget and deficit budget?
- 14) Define money. What are the functions of money?

2x6=12

**Part – C**

**Answer any Four Questions. Each Carries Three Marks**

- 15) What are the sources of public revenue?
- 16) Explain the principles of budgeting.
- 17) What do you mean by inequality? Discuss about different types of inequality in India.
- 18) What is inflation? Discuss about different types of inflation.
- 19). Explain the limitations associated with national income calculation
- 20) Explain the methods of debt redemption.

3x4=12

**Part – D**

**Answer any TWO Questions. Each Carries Five Marks**

- 21) Explain Kerala model of development
- 22) Distinguish between direct and indirect tax. Explain the merits and demerits of direct and indirect taxes in India.
- 23)? Describe the functions of RBI. Explain the qualitative and quantitative credit control methods of RBI?
- 24) What is black money? Examine the causes and measures taken by government of India to

2x5=10

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**HISTORY OF ECONOMIC THOUGHT-I**  
**(COMPLEMENTARY ELECTIVE COURSE)**  
**SEMESTER III**

**Time: 3 hours**

**Maximum marks: 40**

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. Mercantilism
2. Invisible hand
3. Classicism
4. Just price
5. Democratic socialism
6. Stationary state

1x6=6

**Part B**

**Answer any 6 questions (Each question carries 2 marks)**

7. Economic ideas of Physiocracy
8. Laissez faire
9. Utopian Socialism
10. Theory of Market glut
11. Reciprocal demand
12. Naturalism and Optimism
13. Immiserisation of the proletariat
14. Utilitarianism

2x6=12

**Part C**

**Answer any 4 questions (Each question carries 3 marks)**

15. Canons of Taxation
16. Ricardian theory of rent
17. Contributions of Sismondi
18. I R A
19. Malthusian theory of population
20. Factors responsible for the rise of mercantilism

3x4=12

**Part D**

**Answer any 2 questions (Each question carries 5 marks)**

21. Evaluate the contribution of Ancient thinkers to Economic Thought
22. Give a brief account of Marxian ideas
23. Explain the contributions of Utopian socialists
24. Explain Say's Law of Market. What are the implications of this law?

2x5=10



**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS**  
**HISTORY OF ECONOMIC THOUGHT-II**  
**(COMPLEMENTARY ELECTIVE COURSE)**  
**SEMESTER IV**

**Time: 3 hours**

**Maximum marks: 40**

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. Gossen's first Law
2. Effective demand
3. Institutionalism
4. Multiplier
5. Brain drain
6. Quasi-rent

1x6=6

**Part B**

**Answer any 6 questions (Each question carries 2 marks)**

7. Doctrine of Trusteeship
8. Ideas of Carl Menger
9. The 'Drain Theory'
10. Fisher's equation of Exchange
11. Economic thought of Koutilya
10. Ranade's ideas on the role of the state
11. Difference between classical and neo-classical approach
12. What are the features of Ancient Indian Economic Thought

2x6=12

**Part C**

**Answer any 4 questions (Each question carries 3 marks)**

13. Give a brief account of the contributions of Elinor Ostrom.
14. Explain the contributions of Wicksell and Wicksteed to Economic thought
15. Explain the Keynesian Theory of Employment
16. State the contributions of Amartya Sen
19. Explain the features of Marginalist School
20. Briefly explain the contributions of Leon Walras

3x4=12

**Part D**

**Answer any 2 questions (Each question carries 5 marks)**

21. Explain the contributions of Alfred Marshall to Economic Thought
22. Evaluate the salient features of Gandhian Economic Thought
23. Give a brief account of the contributions of Naoroji to Economic Thought
24. Assess the contributions of Keynes to the development of Modern Economic Thought

5x2=10

**MODEL QUESTION PAPER**  
**B.A DEGREE EXAMINATION-**  
**ECONOMICS/ DEVELOPMENT ECONOMICS**  
**POPULATION AND DEVELOPEMNT (COMPLEMENTARY COURSE)**  
**SEMESTER I**

Time: Three Hours

Maximum Marks: 40

**Part A**

(Very short answer type questions) Answer all Questions

1. Define Population study
2. Migration
3. Age Pyramid
4. Infant Mortality
5. Population projection
6. Crude Birth Rate

(6 x 1= 6)

**Part B**

(Short answer type questions) Answer Any **SIX** Questions

7. What are the difference between demography and population study
8. Explain the nature and scope of population study
9. What are the important sources of population data?
10. Explain the term Zero Population growth
11. What you mean by National Population Register
12. Distinguish between positive checks and preventive checks
13. Difference between Gross Reproduction Rate and Net Reproduction Rate.
14. What is demographic Transition?

( 6 x 2 = 12 )

**Part C**

(Short Essay type questions) Answer Any **FOUR** Questions

15. What are the different measures of fertility?
16. Explain the subject matter of population study
17. Explain briefly the important features of National Population Policy of India
18. Explain Evert Lee's theory of Migration
19. Explain the different components population change
20. What are the important methods of population projection

( 4 x 3 = 12 )

**Part D**

(Essay type questions) Answer Any **TWO** Questions

21. Briefly explain the inter relationship between population and economic growth
22. Compare and contrast Malthusian and Optimum theory of population.
23. Briefly explain the causes and consequences of Urbanisation
24. Compare the population growth trend in India and Kerala.

( 5 x 2 = 10 )

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**ECONOMIC GEOGRAPHY (COMPLEMENTARY COURSE)**  
**SEMESTER II**

**Time: Three hours**

**Maximum marks: 40**

**Part – A**

**(Answer all Questions. Each question carries 1 mark)**

1. Define economic geography
2. What is Cluster?
3. Define Space
4. What is Agglomeration?
5. What is Periphery?
6. Define FDI

(1x6=6)

**Part – B**

**Answer any Six Questions. Each question carries 2 marks)**

7. Explain the inter-disciplinary approach in economic geography
8. Prepare a note on world economic geography of growth and development
9. Examine the spatial division of labour theory
10. Explain Emanuel's core periphery theory
11. Examine the factors behind regional disparities in India
12. Prepare a note on decentralized planning for regional development in India
13. Examine the spatial planning for urban development in India
14. Explain the problems faced by agriculture in India

2x6=12

**Part – C**

**(Answer any four Questions. Each question carries 3 marks)**

15. Examine the regional inequality in industrial development in India
16. Explain the regional disparity in income in India
17. Examine the role of five year plans in reducing regional inequality
18. Examine the various key concepts in economic geography
19. Explain the Marxist approach to the uneven development
20. Critically evaluate Krugman's center periphery model

2x4=12

**Part – D**

**(Answer any two Questions. Each question carries 5 marks)**

21. Explain the philosophy, nature and significance of economic geography
22. Critically evaluate central place theory of industrial location
23. Critically evaluate the cumulative causation theory of regional inequality
24. Examine the regional disparity poverty and unemployment since liberalization in India

2x5=10

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2019**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**GENDER ECONOMICS (COMPLEMENTARY COURSE)**  
**Semester IV**

Time: 3hours  
Marks: 40

**Maximum**

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. Morbidity
2. GEM
3. Gender Equity
4. Sex
5. Feminization
6. LGBTQ

1x6=6

**Part B**

**Answer any 6 questions (Each question carries 2 marks)**

7. "Gender is not static or immutable" Explain.
8. Define feminity and masculinity
9. Explain LFPR
10. What do you mean by gender discrimination?
11. Explain gender stratification
12. Explain ICDS
13. Patriarchal and matriarchal families
14. Explain why dowry system is prohibited by law?

2x6=12

**Part C**

**Answer any 4 questions (Each question carries 3 marks)**

15. Discuss the status of women law makers in India.
16. Evaluate the role of Kudumbasree in women empowerment.
17. Explain some major determinants of women's wage.
18. Discuss the impact of technology and modernization on women workers.
19. Distinguish between WID and WAD approach
20. Discuss various schemes to develop and empower women entrepreneurs in India

3x4=12

**Part D**

**Answer any 2 questions (Each question carries 5 marks)**

22. Do you think that the participation of women in the work force will bring changes in their status? Substantiate your answer with reference to Indian conditions.
23. Examine the problems faced by women in labour market.
24. Explain the important women empowerment programmes in India with special reference to Kerala.
25. Explain the gender inequalities in education, health and nutrition.

2x5=10

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2019**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**AGRICULTURAL ECONOMICS (COMPLEMENTARY COURSE)**

Time: 3hours

Maximum Marks: 40

**Part A - Short answer: Answer all questions**

1. What do you mean by New Agricultural Strategy?
2. Define Regulated Market.
3. Define crop insurance.
4. Define Organic Farming.
5. What is do you mean by consolidation of holding?
6. What is the meaning of food security? (6 x 1 = 6)

**Part B - Short Essay**

*Answer any 6 questions*

7. Write about Floor level Price Policy.
8. What is the role of FCI in India?
9. Write a note on NABARD.
10. Write a brief note on National Agricultural Policy.
11. Distinguish between complementary and supplementary production.
12. Write a brief note on the scope of Agricultural Economics.
13. What are the major problems of Agricultural Marketing in India?
14. Write a note on Agricultural Subsidies. (6x 2 =12)

**Part C - Essay**

*Answer any 4 questions*

15. Write a brief note on the role of Agriculture in Economic Development.
16. What are the important linkages between agriculture and non-agricultural sectors?
17. What are the important measures of Land Reforms?
18. Write a note on sustainable agriculture.
19. State the major issues of Kerala Agriculture.
20. Briefly explain about New Economic Policy and Agriculture. (4 x 3 =12)

**Part D - Long Essay**

*Answer any 2 questions*

21. Examine the growth and performance of Indian Agriculture during the Five Year Plans.
22. Critically evaluate the Land Reforms measures introduced in Kerala.
23. What are the impacts of WTO and Regional Trade Agreements on India n Agriculture?
4. Explain the important sources of Agricultural credit in India.

(2 x 5 =10)

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION -**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**BASICS OF ECONOMICS (GENERIC ELECTIVE COURSE)**  
**SEMESTER-V**

**Time: Two hours**

**Maximum marks: 20**

**Part A**

**Answer all questions (Each question carries 1 mark)**

1. Product Differentiation
2. National Income
3. Law of Demand

1x3=3

**Part B**

**Answer any 3 questions (Each question carries 2 marks)**

7. Distinguish between micro and macro economics
8. What are the factors that lead to a shift in the demand curve?
9. Distinguish Economic Growth and Economic Development
10. What are the functions of money?

(2x3=6)

**Part C**

**Answer any 2 questions (Each question carries 3 marks)**

11. Write down the features of perfect competitive market.
12. Explain the nature and scope of economics.
13. What are the features of mixed economy?

(3x2=6)

**Part D**

**Answer any 1 question (Each question carries 5 marks)**

13. "Economics is a science of choice making." Explain the relationship between scarcity and choice in the light of this statement.
14. Explain the causes of Poverty, Unemployment and Inequalities.

1x5=5

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**DEVELOPMENT ISSUES OF INDIAN ECONOMY**  
**(GENERIC ELECTIVE COURSE) SEMESTER-V**

**Time: 2 Hours**

**Maximum: 20 Marks**

**PART-A**

(Answer **all** questions. Each question carries **1** mark)

1. What is poverty line?
2. Define unemployment?
3. What is inclusive growth?

**(3×1=3marks)**

**PART-B**

(Answer any **three** questions. Each question carries **2** marks)

4. Distinguish between absolute poverty and relative poverty.
5. What is labour force participation rate?
6. What is basic needs approach?
7. Define disguised unemployment?

**(3×2=6marks)**

**PART-C**

(Answer any **two** questions. Each question carries **3** marks)

8. Explain the extent and magnitude of poverty in India?
9. Briefly explain the informalisation of labour in India?
10. Explain different types of unemployment in India?

**(2×3=6marks)**

**PART-D**

(Answer any **one** question. Each question carries **five** marks)

11. Critically evaluate the poverty eradication programmes in India since 1991?
12. Explain the causes of poverty, unemployment and inequality in India?

**(5×1=5marks)**

**MODEL QUESTION PAPER**  
**B A DEGREE EXAMINATION - 2019**  
**ECONOMICS/DEVELOPMENT ECONOMICS**  
**KERALA ECONOMY (GENERIC ELECTIVE COURSE)**  
**SEMESTER-V**

**Time: Two hours**

**Maximum marks: 20**

**Part – A (Very short answer type Questions). Answer all Questions.**

- 1) What is demographic transition?
- 2) What is food security?
- 3) Define immigration.

(1x3=3)

**Part – B (Short answer type Questions) Answer any Three Questions**

- 4) What is the nature and extent of unemployment in Kerala?
- 5) Explain the recent trends in the service sector of Kerala.
- 6) Write a note on traditional industries in Kerala.
- 7) Discuss the issue of population ageing in Kerala?

(2x3=6)

**Part – C (Short Essay type Questions) Answer any two Questions**

- 8) Critically examine the recent fiscal crisis of Kerala?
- 9) Discuss about the implications of demographic transition in Kerala?
- 10) What do you understand by “Kerala model of development”?

(3x2=6)

**Part – D (Essay type Questions) Answer any one Question**

- 11) Define decentralization. Discuss about the impact of decentralization policy on service sector?
- 12) Critically examine the role of service sector in Kerala’s development.

(5x1=5)



**MODEL QUESTION PAPER  
DEGREE EXAMINATION  
FUNDAMENTALS OF BUDGET  
(GENERIC ELECTIVE COURSE)  
SEMESTER V**

Time: 2 hours

Max. Marks: 20

**Part – A**

(Short answer type questions. Answer all questions. Each carries **ONE** mark)

- 1) Describe the difference between tax evasion and tax avoidance.
- 2) Define Zero based budget.
- 3) Explain how progressive tax is different from proportional tax.

(1x3=3)

**Part – B**

(Short Essay type questions. Answer any **Three** questions. Each carries **TWO** marks)

- 4) Explain progressive, proportional and regressive taxes.
- 5) Examine the different types of deficit concepts.
- 6) Critically analyse the reasons for the growth of public expenditure.
- 7) Discuss the major highlights of current year's budget.

(2x3=6)

**Part –C**

**(Short Essay type Questions) Answer any two Questions each carries 3 marks**

- 8) Distinguish between surplus budget and deficit budget.
- 9) Explain the functions of finance commission.
- 10) Discuss the major highlights of current year's Union budget

(2x3=6)

**Part –D**

(Essay type questions. Answer any **ONE** question. Each carries **SIX** marks)

- 11) Explain the sources of public revenue.
- 12) Describe the budgetary procedures of central government in India.

(1 x 5= 5)

**MODEL QUESTION PAPER  
B A DEGREE EXAMINATION  
ECONOMICS/DEVELOPMENT ECONOMICS  
INDIAN ECONOMY IN THE POST REFORM PERIOD  
(GENERIC ELECTIVE)  
SEMESTER-V**

**Time: Two hours**

**Maximum marks: 20**

**Part – A**

**Very short answer type Questions). Answer all Questions.**

- 1) What is globalization?
- 2) What are the functions of World Trade Organization?
- 3) Define neoliberalism

**(3x1=3Marks)**

**Part – B**

**(Short answer type Questions) Answer any Three Questions**

- 4) What are the features of reforms of agricultural sector?
- 5) Explain the issue of casualisation of labour.
- 6) What do you meant by privatization? Is privatization of service sectors an appropriate policy decision?

**(3X2=6 Marks)**

**Part – C**

**(Short Essay type Questions) Answer any two Questions**

- 7) Evaluate sectoral wise growth pattern after reforms.
- 8) discuss the objectives of New Industrial Policy -1991
- 9) Explain the inclusive growth strategy and policies
- 10) Explain the service led growth in reforms period.

**(2x3=6 Marks)**

**Part – D**

**(Essay type Questions) Answer any one Question**

- 11) Explain features of the economic crisis faced by India in 1990's. What are major reforms initiatives in India
- 12) Define globalization. Explain the impact of globalization on poverty and unemployment in India

**(1x5=5 Marks)**



## KANNUR UNIVERSITY

(Abstract)

**B.Sc. Mathematics** Programme-Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

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Academic Branch

No.Acad.C2/13083/2019

Civil Station P.O, Dated 22/06/2019

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- Read:-
1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
  2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
  3. U.O No. Acad.C2/429/2017 Vol.II dated 03-06-2019
  4. The Minutes of the Meeting of the Board of Studies in Mathematics held on 06/06/2019
  5. Syllabus of B.Sc. Mathematics Submitted by the Chairperson, Board of Studies in Mathematics (UG)dated 21/06/2019

### ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes, such as conducting the meeting of various Boards of Studies, Workshops, discussion etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Mathematics (UG) finalized the Scheme, Syllabus & Pattern of Question Papers for Core, Complementary Elective & Generic Elective Course of B.Sc.Mathematics Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Mathematics(UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc.Mathematics Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Papers (Core/Complementary Elective/Generic Elective Course) of the B.Sc.Mathematics programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Papers of the B.Sc. Mathematics Programme are uploaded in the University website ([www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in))


Orders are issued accordingly.

Sd/-  
DEPUTY REGISTRAR (ACADEMIC)  
For REGISTRAR

To  
The Principals of Colleges offering B.Sc. Mathematics programme

- Copy to:-
1. The Examination Branch (through PA to CE)
  2. The Chairperson, Board of Studies in Mathematics (UG)
  3. PS to VC/PA to PVC/PA to Registrar
  4. DR/AR-I, Academic
  5. The Computer Programmer (for uploading in the website)
  6. SF/DF/FC

Forwarded/By Order

  
SECTION OFFICER





**KANNUR UNIVERSITY**

**BOARD OF STUDIES, MATHEMATICS (UG)**

**SYLLABUS FOR  
MATHEMATICS CORE COURSE,  
COMPLEMENTARY ELECTIVE COURSES  
AND GENERIC ELECTIVE COURSES**

**CHOICE BASED CREDIT AND SEMESTER SYSTEM**

**(2019 ADMISSION ONWARDS)**

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# **KANNUR UNIVERSITY**

## **VISION AND MISSION STATEMENTS**

### **Vision**

To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

### **Mission**

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavours.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

# **KANNUR UNIVERSITY**

## **PROGRAMME OUTCOMES (PO)**

### **PO 1. Critical Thinking**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

### **PO 2. Effective Citizenship**

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

### **PO 3. Effective Communication**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

### **PO 4. Interdisciplinarity**

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.



## **PREFACE**

Modern education is facing challenges to cater to the requirements of the expanding world of knowledge and information. Research studies in Basic Sciences, especially in Mathematics is to be encouraged in our country. Novel developments in the field of Mathematics are to be incorporated into the syllabus so as to cope with the challenges of ever growing field of knowledge.

The UG Board of Studies in Mathematics has designed a syllabus that familiarizes the students with the basic concepts of the subject. It helps the students to meet the current employment requirements and provides them ample scope for further study in the subject. The syllabi for Core Courses, Complementary Elective Courses and Generic Elective Courses promote self learning through assignments, seminars and project work in addition to class room learning.

The syllabus and curriculum has been prepared after concerted efforts and deliberations at various levels and it meets the programme specific outcomes. The reference materials have been recommended after a thorough study. The Board of Studies puts forward this syllabus for implementation from 2019 admission onwards. We thank all those who have helped us by giving critical suggestions for improvement.

Dr. C.P. Santhosh  
Chairman  
UG Board of Studies in Mathematics  
Kannur University

# **KANNUR UNIVERSITY**

## **PROGRAMME SPECIFIC OUTCOMES OF B.SC. MATHEMATICS PROGRAMME**

- PSO 1:** Understand the basic concepts and tools of Mathematical logic, Set theory, Number theory, Geometry, Calculus, Algebra, Abstract structures, Linear Algebra, Analysis, Laplace transforms, Fourier series, Graph theory, and Optimization and methods of proofs.
- PSO 2:** Model real world problems into Mathematical problems and find solutions and understand the application of Mathematics in other Sciences and Engineering.

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**KANNUR UNIVERSITY**  
**BSc MATHEMATICS PROGRAMME**  
**WORK AND CREDIT DISTRIBUTION STATEMENT**

| Semester     | Course Title                                         | Credits | Hours per week | Total Credits | Total Hours |
|--------------|------------------------------------------------------|---------|----------------|---------------|-------------|
| I            | English Common Course 1                              | 4       | 5              | 20            | 25          |
|              | English Common Course 2                              | 3       | 4              |               |             |
|              | Additional Common Course 1                           | 4       | 4              |               |             |
|              | Core Course 1                                        | 4       | 4              |               |             |
|              | First Complementary Elective Course 1                | 3       | 4              |               |             |
|              | Second Complementary Elective Course 1               | 2       | 4              |               |             |
| II           | English Common Course 3                              | 4       | 5              | 20            | 25          |
|              | English Common Course 4                              | 3       | 4              |               |             |
|              | Additional Common Course 2                           | 4       | 4              |               |             |
|              | Core Course 2                                        | 4       | 4              |               |             |
|              | First Complementary Elective Course 2                | 3       | 4              |               |             |
|              | Second Complementary Elective Course 2               | 2       | 4              |               |             |
| III          | English Common Course 5                              | 4       | 5              | 17            | 25          |
|              | Additional Common Course 3                           | 4       | 5              |               |             |
|              | Core Course 3                                        | 4       | 5              |               |             |
|              | First Complementary Elective Course 3                | 3       | 5              |               |             |
|              | Second Complementary Elective Course 3               | 2       | 5              |               |             |
| IV           | English Common Course 6                              | 4       | 5              | 21            | 25          |
|              | Additional Common Course 4                           | 4       | 5              |               |             |
|              | Core Course 4                                        | 4       | 5              |               |             |
|              | First Complementary Elective Course 4                | 3       | 5              |               |             |
|              | Second Complementary Elective Course 4 (T+P)         | 6(2+4)  | 5              |               |             |
| V            | Core Course 5                                        | 4       | 4              | 21            | 25          |
|              | Core Course 6                                        | 4       | 5              |               |             |
|              | Core Course 7                                        | 4       | 5              |               |             |
|              | Core Course 8                                        | 3       | 4              |               |             |
|              | Core Course 9                                        | 4       | 5              |               |             |
|              | Generic Elective Course                              | 2       | 2              |               |             |
| VI           | Core Course 10                                       | 4       | 5              | 21            | 25          |
|              | Core Course 11                                       | 4       | 5              |               |             |
|              | Core Course 12                                       | 4       | 5              |               |             |
|              | Core Course 13                                       | 4       | 5              |               |             |
|              | Core Course 14 (Discipline Specific Elective Course) | 3       | 5              |               |             |
|              | Project                                              | 2       | ---            |               |             |
| <b>Total</b> |                                                      |         |                | <b>120</b>    |             |

### CREDIT DISTRIBUTION STATEMENT

| Course                                                             | Credit     |
|--------------------------------------------------------------------|------------|
| English Common Course                                              | 22         |
| Additional Common Course                                           | 16         |
| Core Course                                                        | 56         |
| First Complementary Elective Course - Statistics                   | 12         |
| Second Complementary Elective Course -<br>Physics/Computer Science | 12         |
| Generic Elective Course                                            | 2          |
| Total                                                              | <b>120</b> |

**PART A**  
**MATHEMATICS CORE COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**( 2019 ADMISSION ONWARDS )**

| <b>COURSE CODE</b>                  | <b>COURSE TITLE</b>                                                  | <b>SEM.</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> |
|-------------------------------------|----------------------------------------------------------------------|-------------|-----------------------|---------------|-------------------|
| 1B01 MAT                            | Set Theory, Differential Calculus and Numerical Methods              | I           | 4                     | 4             | 3                 |
| 2B02 MAT                            | Integral Calculus and Logic                                          | II          | 4                     | 4             | 3                 |
| 3B03 MAT                            | Analytic Geometry and Applications of Derivatives                    | III         | 5                     | 4             | 3                 |
| 4B04 MAT                            | Number Theory and Applications of Integrals                          | IV          | 5                     | 4             | 3                 |
| 5B05 MAT                            | Set Theory, Theory of Equations and Complex Numbers                  | V           | 4                     | 4             | 3                 |
| 5B06 MAT                            | Real Analysis I                                                      | V           | 5                     | 4             | 3                 |
| 5B07 MAT                            | Abstract Algebra                                                     | V           | 5                     | 4             | 3                 |
| 5B08 MAT                            | Differential Equations and Laplace Transforms                        | V           | 4                     | 3             | 3                 |
| 5B09 MAT                            | Vector Calculus                                                      | V           | 5                     | 4             | 3                 |
| 5D-----                             | Generic Elective Course                                              | V           | 2                     | 2             | 2                 |
| 6B10 MAT                            | Real Analysis II                                                     | VI          | 5                     | 4             | 3                 |
| 6B11 MAT                            | Complex Analysis                                                     | VI          | 5                     | 4             | 3                 |
| 6B12 MAT                            | Numerical Methods, Fourier Series and Partial Differential Equations | VI          | 5                     | 4             | 3                 |
| 6B13 MAT                            | Linear Algebra                                                       | V           | 5                     | 4             | 3                 |
| <b>DISCIPLINE SPECIFIC ELECTIVE</b> |                                                                      |             |                       |               |                   |
| 6B14A MAT                           | Graph Theory                                                         | VI          | 5                     | 3             | 3                 |
| 6B14B MAT                           | Operations Research                                                  |             |                       |               |                   |
| 6B14 C MAT                          | Cryptography                                                         |             |                       |               |                   |
| 6B14D MAT                           | Fuzzy Mathematics                                                    |             |                       |               |                   |
| 6B14E MAT                           | Programming in Python                                                |             |                       |               |                   |
| 6B15 MAT                            | Project                                                              | VI          | ---                   | 2             | ---               |

## EVALUATION

| ASSESSMENT | WEIGHTAGE |
|------------|-----------|
| EXTERNAL   | 4         |
| INTERNAL   | 1         |

### CONTINUOUS INTERNAL ASSESSMENT

| COMPONENT                                             | WEIGHTAGE | MARKS | REMARKS                                                                                                                                        |
|-------------------------------------------------------|-----------|-------|------------------------------------------------------------------------------------------------------------------------------------------------|
| COMPONENT1-<br>ASSIGNMENT /<br>SEMINAR /<br>VIVA-VOCE | 50%       | 6     | For each course, a student has to submit one assignment/<br>attend one seminar/<br>attend one viva-voce                                        |
| COMPONENT 2-<br>TEST PAPER                            | 50%       | 6     | For each course, a student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark. |
| TOTAL                                                 | 100%      | 12    |                                                                                                                                                |

- **Use of Scientific Calculators below 100 functions (that is, upto fx 99) shall be permitted for all the above courses.**

**CORE COURSE 1:  
SET THEORY, DIFFERENTIAL CALCULUS AND  
NUMERICAL METHODS**

| SEMESTER | COURSE CODE     | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|----------|-----------------|----------------|----------|------------|--------------|-----------|-----------|
|          |                 |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>I</b> | <b>1B01 MAT</b> | <b>4</b>       | <b>4</b> | <b>3</b>   | <b>48</b>    | <b>12</b> | <b>60</b> |

**COURSE OUTCOMES**

|     |                                                                                                                                                                    |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Relations and Functions                                                                                                                                 |
| CO2 | Understand limit of a function, limit laws, continuity, Inverse functions and their derivatives                                                                    |
| CO3 | Understand successive differentiation and Leibnitz theorem                                                                                                         |
| CO4 | Understand functions of several variables, limit and continuity, partial derivatives, chain rule, homogenous functions and Euler's theorem on homogenous functions |
| CO5 | Understand bisection method, Regula-falsi method and Newton-Raphson method to solve algebraic and transcendental equations                                         |



# **1B01 MAT: Set Theory, Differential Calculus and Numerical Methods**

## **Unit I - Relations and Functions (22 hours)**

Relations, Types of relations, Partitions, Equivalence relation, Partial ordering relation, Functions, Composition of functions, One-to-one, onto and invertible functions, Mathematical functions, exponential function, logarithmic function (Sections 3.3, 3.6, 3.8, 3.9, 3.10 and sections 4.1 to 4.5 of Text 1).

## **Unit II – Limit, Continuity and Successive differentiation (18 hours)**

Limit of a function and limit laws, continuity, Inverse functions and their derivatives (Sections 2.2, 2.5, 7.1 of Text 2. Proof of Theorem 10 in section 2.5 is omitted).

Successive differentiation, standard results,  $n^{\text{th}}$  derivatives, Leibnitz theorem (Sections 4.1, 4.2 of Text 3).

## **Unit III – Functions of several variables (22 hours)**

Functions of several variables, limit and continuity, partial derivatives, chain rule (theorems without proof) (Sections 14.1, 14.2, 14.3, 14.4 of Text 2).

Homogenous functions, Euler's theorem on homogenous functions (Sections 11.8, 11.8.1 of Text 4).

## **Unit IV - Solution of Algebraic and Transcendental Equations (10 Hours)**

Introduction to solution of algebraic and transcendental equation, Initial approximations,

Bisection method, Regula-falsi method, Newton-Raphson method (Sections 3.2, 3.2.1, 3.3, 3.4, 3.5 of Text 5).

**Texts** 1. S. Lipschutz, Set Theory and Related Topics (2<sup>nd</sup> edition), Schaum's Series

2. G.B, Thomas Jr., M.D. Weir and J.R. Hass, Thomas' Calculus (12<sup>th</sup> edition), Pearson Education

3. Higher Engineering Mathematics, B.S. Grewal (43<sup>rd</sup> edition), Khanna Publishers

4. S Narayan and P.K Mittal , Differential calculus, Revised Edition, S. Chand & Company Ltd

5. S. R. K. Iyengar and R. K. Jain, Mathematical methods (2<sup>nd</sup> edition), Narosa Publishing House.

## **References**

1. H Anton, Bivens and Davis, Calculus, 10<sup>th</sup> edition , Willey

2. E. Kreyszig, Advanced Engineering Mathematics (10<sup>th</sup> edition), Willey

3. S. S. Sastry, Introduction to Numerical Methods (5<sup>th</sup> edition), Prentice Hall of India.
4. V.N. VEDAMURTHY and N.Ch.S.N. Iyengar, Numerical Methods, Vikas Publishing House.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 22                                | <b>48</b>     |
| II    | 21                                |               |
| III   | 24                                |               |
| IV    | 12                                |               |
| Total | <b>79</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)
- *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)
- *Answer any 2 questions* (2 questions x Marks 6 each = 12).

**CORE COURSE 2:  
INTEGRAL CALCULUS AND LOGIC**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| II       | 2B02 MAT    | 4              | 4      | 3          | 48           | 12       | 60    |

**COURSE OUTCOME**

| CO  | CO Statement                                                                                                                                                                                                                            |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Hyperbolic functions                                                                                                                                                                                                         |
| CO2 | Understand Reduction formulae for trigonometric functions and evaluation of definite integrals $\int_0^{\frac{\pi}{2}} \sin^n x \, dx$ , $\int_0^{\frac{\pi}{2}} \cos^n x \, dx$ and $\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x \, dx$ . |
| CO3 | Understand Polar coordinates                                                                                                                                                                                                            |
| CO4 | Understand Double integrals in Cartesian and polar form.                                                                                                                                                                                |
| CO5 | Understand triple integrals in rectangular, cylindrical and spherical co-ordinates                                                                                                                                                      |
| CO6 | Understand Substitution in multiple integrals                                                                                                                                                                                           |
| CO7 | Understand Numerical integration: Trapezoidal rule, Simpson's 1/3 <sup>rd</sup> rule                                                                                                                                                    |
| CO8 | Understand Logic and methods of proofs                                                                                                                                                                                                  |
| CO9 | Understand Propositional functions, truth set and Negation of quantified statements                                                                                                                                                     |

## 2B02 MAT: Integral Calculus and Logic

### Unit I – Integration of hyperbolic functions, Reduction formulae

(20 hours)

Hyperbolic functions (Section 7.7 of Text 1).

Reduction formulae, Integration of  $\sin^n x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^n x \, dx$ , Integration of  $\cos^n x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \cos^n x \, dx$ , Integration of  $\sin^p x \cos^q x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x \, dx$ , integration of  $\tan^n x$ , integration of  $\cot^n x$ , integration of  $\sec^n x$ , integration of  $\operatorname{cosec}^n x$  (Sections 2.8, 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2 of Text 2)

### Unit II – Multiple integrals

(20 hours)

Polar coordinates (Sections 11.3 of Text 1).

Multiple integrals: Double and iterated integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular coordinates, triple integrals in cylindrical and spherical co-ordinates, substitution in multiple integrals (Sections 11.3, 15.1, 15.2, 15.3, 15.4, 15.5, 15.7, 15.8 of Text 1).

### Unit III - Numerical integration

(12 hours)

Numerical integration, Trapezoidal rule, Simpson's 1/3 rd rule (Sections 6.3, 6.3.1, 6.3.2 of Text 3).

### Unit IV – Logic and proofs

(20 hours)

Logic and proofs (Appendix A of Text 4).

Propositional functions and truth set, Negation of quantified statements (Section 10.11, 10.12 of Text 5).

### Texts

1. G.B, Thomas Jr., M.D. Weir and J.R. Hass, Thomas' Calculus (12<sup>th</sup> edition), Pearson Education
2. S. Narayan and P.K. Mittal, Integral Calculus, S. Chand
3. S. R. K. Iyengar and R. K. Jain, Mathematical methods (2<sup>nd</sup> edition), Narosa Publishing House
4. R.G. Bartle and D.R. Sherbert, Introduction to Real Analysis (4<sup>th</sup> edition), Wiley
5. S. Lipschutz, Set Theory and Related Topics (2<sup>nd</sup> edition), Schaum's Series.

## References:

1. S.S. Sastry, Introductory Methods of Numerical Analysis (5<sup>th</sup> edition), PHI.
2. F.B. Hidebrand, Introduction to Numerical Analysis, TMH.
3. E. Kreyzig, Advanced Engineering Mathematics (10<sup>th</sup> Edition), Wiley
4. V.N. Vedamurthy and N.Ch.S.N. Iyengar, Numerical Methods, Vikas Publishing House.

## Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 19                                | <b>48</b>     |
| II    | 22                                |               |
| III   | 14                                |               |
| IV    | 24                                |               |
| Total | <b>79</b>                         |               |

## Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)
- *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)
- *Answer any 2 questions* (2 questions x Marks 6 each = 12).

**CORE COURSE 3:  
ANALYTIC GEOMETRY AND  
APPLICATIONS OF DERIVATIVES**

| SEMESTER   | COURSE CODE     | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|------------|-----------------|----------------|----------|------------|--------------|-----------|-----------|
|            |                 |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>III</b> | <b>3B03 MAT</b> | <b>5</b>       | <b>4</b> | <b>3</b>   | <b>48</b>    | <b>12</b> | <b>60</b> |

**COURSE OUTCOMES**

|      |                                                                                                                                 |
|------|---------------------------------------------------------------------------------------------------------------------------------|
| CO1  | Understand cartesian equation of conics, eccentricity, polar equations for a conic, lines, circles                              |
| CO2  | Understand Tangnts, Normals and Asymptotes                                                                                      |
| CO3  | Understand Curvature, Radius of curvature ,Centre of Curvature, Circle of curvature and Evolutes of Cartesian and polar curves, |
| CO 4 | Understand Rolle's Theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem and Taylors Theorem                      |
| CO5  | Understand extreme values of functions, monotonic functions, first derivative test , concavity and curve sketching              |
| CO6  | Understand Indeterminate forms                                                                                                  |

## **3B03MAT: Analytic Geometry and Applications of Derivatives**

### **Unit I: Conic Sections (25 hours)**

Conic Sections: Parabola, Ellipse, Hyperbola, Conics in Polar Coordinates: Eccentricity, polar equations for a conic, lines, circles (Sections 11.6, 11.7 of Text 1)

### **Unit II: Tangents, Normals and Asymptotes (25 hours)**

Tangents and normals: Equation of tangent, equation of Normal, Angle of intersection of two curves, Lengths of tangents, normal.

Polar Curves: Angle between radius vector and tangent, Length of the perpendicular from pole on the tangent.

Asymptotes.

(Sections 4.6, 4.7, 4.16 of Text 2).

### **Unit III: Curvature and Evolutes (15 hours)**

Curvature, Radius of curvature for Cartesian and polar curves, Centre of Curvature, Circle of curvature, Evolutes (Sections 4.10, 4.11, 4.12 of Text 2).

### **Unit IV: Mean Value Theorems, Extreme values of functions, Curve Sketching and Indeterminate forms (25 hours)**

Fundamental Theorems: Rolle's Theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem, Taylor's Theorem (without proof), Expansions of functions (Sections 4.3, 4.4 of Text 2)

Extreme values of functions, Monotonic functions and first derivative test, concavity and curve sketching, Indeterminate forms (Proof of L'Hospital's rule excluded) (Sections 4.1, 4.3, 4.4, 7.5 of Text 1).

### **Texts**

1. G.B. Thomas Jr., M.D. Weir and J.R. Hass, Thomas' Calculus (12<sup>th</sup> edition), Pearson Education
2. Higher Engineering Mathematics, B.S. Grewal (43<sup>rd</sup> edition), Khanna Publishers.

### **References**

1. S.L. Loney, The Elements of Coordinate Geometry, Part I, A.I.T.B.S. Publishers
2. H Anton, Bivens and Davis, Calculus (10<sup>th</sup> edition), Wiley
3. E. Kreyszig, Advanced Engineering Mathematics (10<sup>th</sup> edition), Wiley
4. S. Narayan and P.K. Mittal, Differential calculus (Revised Edition), S. Chant & Company Ltd.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 19                                | <b>48</b>     |
| II    | 25                                |               |
| III   | 10                                |               |
| IV    | 25                                |               |
| Total | 79                                |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)
- *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)
- *Answer any 2 questions* (2 questions x Marks 6 each = 12).



**CORE COURSE 4:  
NUMBER THEORY AND  
APPLICATIONS OF INTEGRALS**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| IV       | 4B04 MAT    | 5              | 4      | 3          | 48           | 12       | 60    |

**COURSE OUTCOMES**

|     |                                                                                                               |
|-----|---------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Division algorithm, Greatest common Divisor, Euclidean Algorithm, Diophantine equation $ax+by=c$ . |
| CO2 | Understand Primes and their distribution, fundamental theorem of arithmetic, the sieve of Eratosthenes        |
| CO3 | Understand Basic properties of congruence                                                                     |
| CO4 | Understand Picard's little theorem, Wilson's theorem and Euler's theorem                                      |
| CO5 | Understand Substitution and the area between curves, Arc length, Areas and length in polar co-ordinates       |
| CO6 | Understand Volumes using cross sections, volumes using cylindrical shells and areas of surfaces of revolution |

## 4B04 MAT: Number Theory and Applications of Integrals

### Unit I - Number Theory I (22 hours)

Number theory: Division algorithm (proof omitted), Greatest common Divisor, Euclidean Algorithm, Diophantine equation  $ax+by =c$ , primes and their distribution, fundamental theorem of arithmetic, the sieve of Eratosthenes (Sections 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2 of Text 1).

### Unit II – Number Theory II (23 hours)

Basic properties of congruence, the little theorem and pseudo primes, Wilson’s theorem, Euler’s theorem (Proofs of Fermat’s, Wilson’s and Euler’s theorems excluded) (Sections 4.2, 5.2, 5.3, 7.3 of Text 1).

### Unit III – Area between curves and Arc length (23hours)

Substitution and the area between curves, Arc length, Areas and length in polar co-ordinates (Sections 5.6, 6.3, 11.5 of Text 2).

### Unit IV – Volumes of solids and Areas of surfaces of revolution (22 hours)

Volumes using cross sections, areas of surfaces of revolution (Sections 6.1, 6.4 of Text 2).

#### Texts

1. David M Burton, Elementary Number theory, 7<sup>th</sup> edition, Mc Graw Hill
2. G.B, Thomas Jr., M.D. Weir and J.R. Hass, Thomas’ Calculus (12<sup>th</sup> edition), Pearson Education.

#### References

1. T.M. Apostol, Introduction to Analytic Number Theory, Springer
2. N. Koblitz, A Course in Number theory and Cryptography (2<sup>nd</sup> edition), Springer
3. H Anton, Bivens and Davis, Calculus (10<sup>th</sup> edition), Willey
4. S. Narayan, Integral calculus, S. Chand & Company Ltd
5. Higher Engineering Mathematics, B.S. Grewal (43<sup>rd</sup> edition), Khanna Publishers.

#### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 19                                | <b>48</b>     |
| II    | 20                                |               |
| III   | 20                                |               |
| IV    | 20                                |               |
| Total | <b>79</b>                         |               |

## Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)
- *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)
- *Answer any 2 questions* (2 questions x Marks 6 each = 12).

**CORE COURSE 5:  
SET THEORY, THEORY OF EQUATIONS  
AND COMPLEX NUMBERS**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| V        | 5B05 MAT    | 4              | 4      | 3          | 48           | 12       | 60    |

**COURSE OUTCOMES**

|     |                                                                                                                                                                                                                                                                                                                                                        |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand finite and infinite sets, Countable and Uncountable sets, Cantor's theorem.                                                                                                                                                                                                                                                                 |
| CO2 | Understand Roots of equations, Relations connecting the roots and coefficients of an equation, Transformation of equations, The cubic equation, Character and position of roots of an equation.                                                                                                                                                        |
| CO3 | Understand Descarte's rule of signs, De Gua's Rule, Limits to the roots of an equation, Rational roots of equations, Newton's method of divisors, Symmetric functions of roots of an equation, Symmetric functions involving only the difference of the roots of $f(x)=0$ , Equations whose roots are symmetric functions of $\alpha, \beta, \gamma$ . |
| CO4 | Understand Reciprocal equations.                                                                                                                                                                                                                                                                                                                       |
| CO5 | Understand Cubic equation, Equation whose roots are the squares of the difference of the roots, Character of the Roots, Cardan's Solution                                                                                                                                                                                                              |
| CO6 | Understand Roots of complex numbers, General form of De Moivre's theorem, the $n^{\text{th}}$ roots of unity, the $n^{\text{th}}$ roots of -1, Factors of $x^n-1$ and $x^n+1$ , the imaginary cube roots of unity.                                                                                                                                     |
| CO7 | Understand polar form of complex numbers, powers and roots.                                                                                                                                                                                                                                                                                            |

## **5B05 MAT:**

### **Set Theory, Theory of Equations and Complex Numbers**

#### **Unit I - Finite and Infinite Sets** **(14 hours)**

Finite and infinite sets, Countable sets, Uncountable sets, Cantor's theorem (Section 1.3 of Text 1).

#### **Unit II - Theory of equations I** **(20 hours)**

Roots of equations, Relations connecting the roots and coefficients of an equation, Transformation of equations, Special cases, The cubic equation, Character and position of roots of an equation, Some general theorems, Descartes's rule of signs, Corollaries, De Gua's Rule, Limits to the roots of an equation, To find the rational roots of an equation, Newton's method of divisors, Symmetric functions of roots of an equation, Symmetric functions involving only the difference of the roots of  $f(x) = 0$ , Equations whose roots are symmetric functions of  $\alpha, \beta, \gamma$  (Sections 1 to 17 in chapter VI of Text 2).

#### **Unit III - Theory of equations II** **(20 hours)**

Reciprocal equation (Proof of theorems excluded) (Section 1 in chapter XI of Text 2)

The Cubic equation, Equation whose roots are the squares of the difference of the roots, Character of the Roots, Cardan's Solution (Section 5 of chapter VI and sections 1 to 4 of chapter XI I in Text 2).

#### **Unit IV – Complex numbers** **(18 hours)**

*Quick review* of a complex number, equality of complex numbers, fundamental operations, zero product, geometrical representation of complex numbers, addition and subtraction, product and quotients, conjugate numbers (Sections 1 to 14 in chapter V of Text 2) [*Questions should not be included in the End Semester Examination from these topics for Quick review*].

Roots of complex numbers, General form of De Moivre's theorem, the  $n^{\text{th}}$  roots of unity, the  $n^{\text{th}}$  roots of -1, Factors of  $x^n - 1$  and  $x^n + 1$ , the imaginary cube roots of unity (Sections 15 to 20 of chapter V of Text 2).

Polar form of complex numbers, powers and roots (Section 13.2 of Text 3).

#### **Texts**

1. R.G. Bartle and D. R. Sherbert, Introduction to Real Analysis (4<sup>th</sup> edition), Wiley
2. Bernard and Child, Higher Algebra, A.I.T.B.S. Publishers
3. E. Kreyszig, Advanced Engineering Mathematics (10<sup>th</sup> edition), Wiley.

## References

1. S.S. Sastry, Engineering Mathematics, Vol 1 (4<sup>th</sup> edition), PHI
2. H.S. Hall and S.R. Knight, Higher Algebra, A.I.T.B.S. Publishers
3. B.S. Grewal, Higher Engineering Mathematics (43<sup>rd</sup> edition), Khanna Publishers.

## Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 13                                | 48            |
| II    | 24                                |               |
| III   | 22                                |               |
| IV    | 20                                |               |
| Total | 79                                |               |

## Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)
- *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)
- *Answer any 2 questions* (2 questions x Marks 6 each = 12).

## CORE COURSE 6: REAL ANALYSIS I

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| V        | 5B06 MAT    | 5              | 4      | 3          | 48           | 12       | 60    |

### COURSE OUTCOMES

|     |                                                                                                                                                                                                                       |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Algebraic Properties, Order Properties and Absolute values of $\mathbb{R}$ . Understand the Completeness Property of $\mathbb{R}$ and its applications to derive Archimedean Property and Density theorem. |
| CO2 | Understand intervals in the real line.                                                                                                                                                                                |
| CO3 | Understand Sequences and their Limits, Limit Theorems, Monotone Sequences.                                                                                                                                            |
| CO4 | Understand Subsequences and the Bolzano-Weierstrass Theorem, The Cauchy Criterion.                                                                                                                                    |
| CO5 | Understand Infinite Series, Absolute Convergence.                                                                                                                                                                     |
| CO6 | Understand Comparison test, Root test, Ratio test, Integral test and Raabe's test for Absolute convergence.                                                                                                           |
| CO7 | Understand Alternating series test, Dirichlet's test and Abel's test for Non Absolute convergence.                                                                                                                    |
| CO8 | Understand Continuous Functions, composition of continuous functions and continuous functions on intervals.                                                                                                           |

## 5B06 MAT: Real Analysis I

### Unit I - The Real Numbers (20 hours)

Algebraic and Order Properties of  $\mathbb{R}$ , Absolute Value and Real Line, The Completeness Property of  $\mathbb{R}$ , Applications of the Supremum Property, Intervals (Sections 2.1, 2.2, 2.3, 2.4, 2.5 of the Text).

### Unit II – Sequences (30 hours)

Sequences and their Limits, Limit Theorems, Monotone Sequences, Subsequences and the Bolzano-Weierstrass Theorem, The Cauchy Criterion (Sections 3.1, 3.2, 3.3, 3.4, 3.5 of the Text).

### Unit III - Series (20 hours)

Introduction to Infinite Series, Absolute Convergence, Tests for Absolute Convergence, Tests for Non Absolute Convergence (Sections 3.7, 9.1, 9.2, 9.3 of the Text).

### Unit IV - Continuous Functions (20 hours)

Continuous Functions, Combination of Continuous Functions, Continuous Functions on Intervals (Sections 5.1, 5.2, 5.3 of the Text).

### Text

R.G. Bartle and D.R. Sherbert, Introduction to Real Analysis (4<sup>th</sup> edition), Wiley.

### References

1. T.M. Apostol, Mathematical Analysis (2<sup>nd</sup> edition), Addison-Wesley
2. W. Rudin, Principles of Mathematical Analysis (3<sup>rd</sup> edition), McGraw-Hill
3. H.L. Royden, Real Analysis (3<sup>rd</sup> edition), PHI
4. R.R. Goldberg, Methods of Real Analysis, Oxford & IBH Publishing Company
5. D. Chatterjee, Real Analysis, PHI.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 18                                | 48            |
| II    | 25                                |               |
| III   | 20                                |               |
| IV    | 16                                |               |
| Total | 79                                |               |



## Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)
- *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)
- *Answer any 2 questions* (2 questions x Marks 6 each = 12)

## CORE COURSE 7: ABSTRACT ALGEBRA

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| V        | 5B07 MAT    | 5              | 4      | 3          | 48           | 12       | 60    |

### COURSE OUTCOMES

|     |                                                                                             |
|-----|---------------------------------------------------------------------------------------------|
| CO1 | Understand definition and elementary properties of Groups, Subgroups and Cyclic groups      |
| CO2 | Understand Groups of Permutations, orbits, Alternating groups and theorem of Lagrange       |
| CO3 | Understand group homomorphisms , factor Groups                                              |
| CO4 | Understand Fundamental Homomorphism Theorems                                                |
| CO5 | Understand definition and properties of rings and fields                                    |
| CO6 | Understand Ring homomorphisms and isomorphisms                                              |
| CO7 | Understand zero divisors , integral domains , characteristic of a ring and their properties |

## 5B07 MAT: Abstract Algebra

### Unit I (27 hours)

Groups and Subgroups - Binary Operations, Groups, Subgroups, Cyclic Groups (Sections 2, 4, 5, 6 of the Text).

### Unit II (28 hours)

Groups of Permutations, Orbits, Cycles and the Alternating Groups, Cosets and Theorem of Lagrange (Sections 8, 9, 10 of the Text).(Proof of Theorem 9.15 omitted).

### Unit III (20 hours)

Homomorphisms, Factor Groups (Sections 13, 14 of the Text).

### Unit IV (15 hours)

Rings and Fields, Integral Domains (Sections 18, 19 of the Text).

*(Problems involving direct products are omitted from all sections)*

### Text

J.B. Fraleigh, A First Course in Abstract Algebra (7<sup>th</sup> edition), Pearson.

### References

1. I.N. Herstein, Topics in Algebra (2<sup>nd</sup> edition), Wiley
2. M. Artin, Algebra, Prentice Hall
3. D. Chaterjee, Abstract Algebra (2<sup>nd</sup> edition), PHI
4. J.A. Gallian, Contemporary Abstract Algebra, Narosa
5. P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul, Basic Abstract Algebra (2<sup>nd</sup> edition), Cambridge University Press.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 27                                | 48            |
| II    | 26                                |               |
| III   | 16                                |               |
| IV    | 10                                |               |
| Total | 79                                |               |

### **Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 8 questions* (8 questions x Marks 2 each=16)
- Part C - Essay** (7 questions x Marks 4 each = 28)
- *Answer any 4 questions* ( 4 questions x Marks 4 each=16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)
- *Answer any 2 questions* ( 2 questions x Marks 6 each=12).

**CORE COURSE 8:  
DIFFERENTIAL EQUATIONS AND  
LAPLACE TRANSFORMS**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| V        | 5B08 MAT    | 4              | 3      | 3          | 48           | 12       | 60    |

**COURSE OUTCOMES**

|     |                                                                                                                                                           |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Separable ODEs, Exact ODEs, Linear ODEs, Bernoulli equation and methods to solve these ODEs                                                    |
| CO2 | Understand the theorem of Existence and Uniqueness of solutions of first and second order ODEs                                                            |
| CO3 | Understand Homogeneous Linear ODEs of Second Order and solve homogeneous linear ODEs of second order with constant coefficients and Euler-Cauchy equation |
| CO4 | Understand Nonhomogeneous ODEs and solve by variation of parameters                                                                                       |
| CO5 | Understand Laplace Transform and inverse Laplace Transformation                                                                                           |
| CO6 | Understand The first and The second shifting theorems and their applications                                                                              |
| CO7 | Understand the methods to find Laplace transforms of derivatives and integrals of functions                                                               |
| CO8 | Understand the method of differentiating and integrating Laplace transform                                                                                |
| CO9 | Solve ordinary differential equations and integral equations using Laplace transform                                                                      |

## **5B08 MAT: Differential Equations and Laplace Transforms**

### **Unit I - First Order ODEs (25Hours)**

First Order ODEs: Basic concepts (Modelling excluded), Separable ODEs (Modelling excluded), Exact ODEs. Integrating factors, Linear ODEs, Bernoulli equation (except Population Dynamics), Orthogonal Trajectories, Existence and uniqueness of solutions (Sections 1.1, 1.3, 1.4, 1.5, 1.6, 1.7 in Chapter 1 of the Text).

### **Unit II – Second-Order Linear ODEs (22 Hours)**

Second-Order Linear ODEs: Homogeneous Linear ODEs of Second Order, Homogeneous Linear ODEs with Constant Coefficients, Differential Operators, Euler-Cauchy Equations, Statement of Existence and Uniqueness theorem for initial value problems, linear independence of solutions, Wronskian, general solution, Nonhomogeneous ODEs, Method of undetermined coefficients, Solution by Variation of Parameters (Sections 2.1, 2.2, 2.3, 2.5, 2.6, 2.7, 2.10 in Chapter 2 of the Text).

### **Unit III - Laplace Transforms (25 hours)**

Laplace Transform, Inverse Transform, Linearity. s-Shifting, Transforms of Derivatives and Integrals. ODEs, Unit Step Function. t-Shifting, Short Impulses, Dirac's Delta Function, Partial Fractions, Convolution, Integral Equations, Differentiation and Integration of Transforms (Sections 6.1 to 6.6 in Chapter 6 of the Text).

### **Texts**

E. Kreyzig, Advanced Engineering Mathematics, 10<sup>th</sup> Edition, John Wiley

### **References**

1. S.L. Ross, Differential Equations, 3<sup>rd</sup> Edition, Wiley.
2. G. Birkhoff and G.C. Rota, Ordinary Differential Equations, 3<sup>rd</sup> Edition, Wiley and Sons
3. E.A. Coddington, An Introduction to Ordinary Differential Equations, Printice Hall
4. W.E. Boyce and R.C. Diprima, Elementary Differential Equations and Boundary Value Problems, 9<sup>th</sup> Edition, Wiley.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 30                                | <b>48</b>     |
| II    | 28                                |               |
| III   | 21                                |               |
| Total | <b>79</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)
- *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)
- *Answer any 2 questions* (2 questions x Marks 6 each = 12).

## CORE COURSE 9: VECTOR CALCULUS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| V        | 5B09 MAT    | 5              | 4      | 3          | 48           | 12       | 60    |

### COURSE OUTCOMES

|      |                                                                                                                                                    |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1  | Understand lines and planes in space                                                                                                               |
| CO2  | Understand curves in space, their tangents, normal, curvature, tangential and normal curvature of acceleration                                     |
| CO3  | Understand Directional derivatives and gradient vectors, tangent planes and differentials. Solve extreme value problems using Lagrange multipliers |
| CO4  | Understand Partial derivatives with constrained variables and Taylor's formula for two variables                                                   |
| CO5  | Understand Line integrals. Solve for work, circulation and flux using line integrals                                                               |
| CO6  | Understand path independence conservative fields and potential functions                                                                           |
| CO7  | Understand Green's theorem and solve problems using Green's theorem                                                                                |
| CO8  | Understand Surface area and surface integrals                                                                                                      |
| CO9  | Understand Stoke's theorem and solve problems using Stoke's theorem                                                                                |
| CO10 | Understand Divergence theorem and solve problems using Divergence theorem                                                                          |



## 5B09 MAT: Vector Calculus

### Unit I – Geometry of space and motion in space (25 Hours)

Lines and planes in space, curves in space and their tangents, arc length in space, curvature and normal vector of a curve, tangential and normal components of acceleration (Sections 12.5, 13.1, 13.3, 13.4, 13.5 of the Text).

### Unit II - Partial derivatives (25 Hours)

Directional derivatives and gradient vectors, Tangent planes and differentials, Extreme values and saddle points, Lagrange multipliers, Partial derivatives with constrained variables, Taylor's formula for two variables (Sections 14.5, 14.6, 14.7, 14.8, 14.10 of the Text).

### Unit III – Integration in vector fields I (20 Hours)

Line integrals, Vector fields and line integrals: work, circulation, flux, Path independence, conservative fields and potential functions, Green's theorem in the plane (Sections 16.1, 16.2, 16.3, 16.4 of the Text).

### Unit IV - Integration in vector fields II (20 Hours)

Surfaces and area, surface integrals, Stokes' theorem (theorem without proof) (paddle wheel interpretation of  $\nabla \times \mathbf{F}$  is excluded), the Divergence Theorem (theorem without proof) (Gauss' law: one of the four great laws of Electromagnetic Theory, continuity equation of hydrodynamics, unifying the integral theorems are excluded) (Sections 16.5, 16.6, 16.7, 16.8 of the Text).

### Text

G.B, Thomas Jr., M.D. Weir and J.R. Hass, Thomas' Calculus (12<sup>th</sup> edition), Pearson Education

### References

1. E. Kreyzig, Advanced Engineering Mathematics (10<sup>th</sup> Edition), Wiley
2. H. F. Davis and A. D. Snider, Introduction to Vector Analysis (6<sup>th</sup> Edition), Universal Book Stall, New Delhi.
3. F. W. Bedford and T. D. Dwivedi, Vector Calculus, McGraw Hill Book Company
4. S.S. Sastry, Engineering Mathematics , Vol 2 (4<sup>th</sup> edition), PHI
5. B.S. Grewal, Higher Engineering Mathematics (43<sup>rd</sup> edition), Khanna Publishers.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 22                                | <b>48</b>     |
| II    | 25                                |               |
| III   | 18                                |               |
| IV    | 14                                |               |
| Total | <b>79</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
• *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)  
• *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)  
• *Answer any 2 questions* (2 questions x Marks 6 each = 12).

## CORE COURSE 10: REAL ANALYSIS II

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| VI       | 6B10 MAT    | 5              | 4      | 3          | 48           | 12       | 60    |

### COURSE OUTCOMES

|     |                                                                                                 |
|-----|-------------------------------------------------------------------------------------------------|
| CO1 | Understand Uniform Continuity, Monotone and Inverse Functions                                   |
| CO2 | Understand Riemann Integral and Riemann-integrable Functions                                    |
| CO3 | Understand Fundamental Theorem of Calculus                                                      |
| CO4 | Understand Improper Integrals                                                                   |
| CO5 | Understand Beta and Gamma Functions and their properties.                                       |
| CO6 | Understand Transformations of Gamma Function and Duplication formula                            |
| CO7 | Understand Pointwise and Uniform Convergence of sequence of functions and Interchange of Limits |
| CO8 | Understand Series of Functions                                                                  |
| CO9 | Understand the concept of Metric Spaces                                                         |

## 6B10 MAT: Real Analysis II

### **Unit I – Uniform continuity and Monotone functions (20 hours)**

Uniform Continuity, Monotone and Inverse Functions (Sections 5.4, 5.6 of Text 1).

### **Unit II – Riemann Integral (25 hours)**

Riemann Integral, Riemann Integrable functions (proof of Additivity theorem is excluded), The Fundamental Theorem of Calculus (Lebesgue's Integrability Criterion and proof of Composition Theorem are excluded) (Sections 7.1, 7.2, 7.3 of Text 1).

### **Unit III - Improper Integrals and Beta and Gamma Functions (25 hours)**

Improper Integrals (Section 8.7 of Text 2).

Beta and Gamma Functions – Definitions, Properties of Beta and Gamma Functions, Transformations of Gamma Function, Some Important Deductions, Duplication formula (Sections 7.1, 7.2, 7.3, 7.4, 7.5 of Text 3).

### **Unit IV – Sequence and Series of Functions and Metric spaces (20 hours)**

Pointwise and Uniform Convergence, Interchange of Limits, Series of Functions (Sections 8.1, 8.2, 9.4 of Text 1).

Metric Spaces – Definition, examples, neighbourhood of a point (Relevant topics from section 11.4 of the Text).

### **Texts**

1. R.G. Bartle and D.R. Sherbert, Introduction to Real Analysis (4<sup>th</sup> edition), Wiley
2. G.B. Thomas Jr., M.D. Weir and J.R. Hass, Thomas' Calculus (12<sup>th</sup> edition), Pearson Education
3. S. Narayan and P.K. Mittal, Integral Calculus (11<sup>th</sup> edition), S. Chand Publishers.

### **References**

1. T.M. Apostol, Mathematical Analysis (2<sup>nd</sup> edition), Addison-Wesley
2. W. Rudin, Principles of Mathematical Analysis (3<sup>rd</sup> edition), McGraw-Hill
3. H.L. Royden, Real Analysis (3<sup>rd</sup> edition), PHI
4. B.S. Grewal, Higher Engineering Mathematics (43<sup>rd</sup> edition), Khanna Publishers
5. S.S. Sastry, Engineering Mathematics, Vol 2 (4<sup>th</sup> edition), PHI
6. D. Chatterjee, Real Analysis, PHI.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 15                                | <b>48</b>     |
| II    | 22                                |               |
| III   | 24                                |               |
| IV    | 18                                |               |
| Total | <b>79</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)
- *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)
- *Answer any 2 questions* (2 questions x Marks 6 each = 12).

**CORE COURSE 11:  
6B11 MAT: COMPLEX ANALYSIS**

| SEMESTER  | COURSE CODE     | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|-----------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                 |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>VI</b> | <b>6B11 MAT</b> | <b>5</b>       | <b>4</b> | <b>3</b>   | <b>48</b>    | <b>12</b> | <b>60</b> |

**COURSE OUTCOMES**

|     |                                                                                                                                            |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Analytic Function, Cauchy–Riemann Equations. Laplace’s Equation.                                                                |
| CO2 | Understand Exponential Function, Trigonometric Functions, Hyperbolic Functions, Logarithmic functions and General Power of complex numbers |
| CO3 | Understand line integral in the complex plane ,Cauchy’s integral theorem , Cauchy’s integral formula and derivatives of analytic functions |
| CO4 | Understand convergence of Sequences and Series of complex functions                                                                        |
| CO5 | Understand power series, functions given by power series, Taylor series, Maclaurin’s Series and Laurent Series                             |
| CO6 | Understand singularities and zeros of complex functions                                                                                    |
| CO7 | Understand residue integration method and integrate real integrals                                                                         |

## 6B11 MAT: Complex Analysis

### Unit I – Complex Functions and Analyticity (24 hours)

Complex Functions, Limit, Continuity, Derivative, Analytic Function, Cauchy–Riemann Equations, Laplace’s Equation, Exponential Function, Trigonometric and Hyperbolic Functions, Euler’s Formula, Logarithm, General Power, Principal Value (Sections 13.3, 13.4, 13.5, 13.6, 13.7 of the Text).

### Unit II – Complex Integration (24 hours)

Line Integral in the Complex Plane, Cauchy’s Integral Theorem, Cauchy’s Integral Formula, Derivatives of Analytic Functions (Sections 14.1, 14.2, 14.3, 14.4 of the Text).

### Unit III – Power Series, Taylor Series (20 hours)

Sequences, Series, Convergence, Power Series, Functions given by Power Series, Taylor and Maclaurin’s Series (Proof of Taylor’s theorem excluded) (Sections 15.1, 15.2, 15.3, 15.4 of the Text).

### Unit IV - Laurent Series, Residue Integration (22 hours)

Laurent Series (Proof of Laurent’s Theorem excluded), Singularities and Zeros, Infinity, Residue Integration Method (Sections 16.1, 16.2, 16.3 of the Text).

### Text

E. Kreyzig, Advanced Engineering Mathematics, 10th Edition, John Wiley.

### References

1. J.W. Brown and R.V. Churchill, Complex Variables and Applications (7<sup>th</sup> edition), McGraw-Hill
2. S.S. Sastry, Engineering Mathematics, Vol 2 (4<sup>th</sup> edition), PHI
3. W. Rudin, Real and Complex Analysis (3<sup>rd</sup> edition), Tata McGraw-Hill
4. L.V. Ahlfors, Complex Analysis (3<sup>rd</sup> edition), McGraw-Hill
5. J.B. Conway, Functions of One Complex Variable (2<sup>nd</sup> edition), Springer
6. S. Ponnusamy, Foundations of Complex Analysis (2<sup>nd</sup> edition), Narosa.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 21                                | 48            |
| II    | 20                                |               |
| III   | 18                                |               |
| IV    | 20                                |               |
| Total | 79                                |               |

### **Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
• *Answer any 8 questions* (8 questions x Marks 2 each=16)
- Part C - Essay** (7 questions x Marks 4 each = 28)  
• *Answer any 4 questions* ( 4 questions x Marks 4 each=16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)  
• *Answer any 2 questions* ( 2 questions x Marks 6 each=12).



**CORE COURSE 12:  
NUMERICAL METHODS, FOURIER SERIES AND  
PARTIAL DIFFERENTIAL EQUATIONS**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| VI       | 6B12 MAT    | 5              | 4      | 3          | 48           | 12       | 60    |

**COURSE OUTCOMES**

|     |                                                                                                                                                                                                                                                                               |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Interpolation techniques: Interpolation with unevenly spaced points, Lagrange interpolation, Newton's divided differences interpolation, Finite difference operators and finite differences, Newton's interpolation formulae and Central difference interpolation. |
| CO2 | Understand Numerical differentiation using difference formulae                                                                                                                                                                                                                |
| CO3 | Understand Picard's method, Solution by Taylor series method, Euler method and Runge- Kutta methods.                                                                                                                                                                          |
| CO4 | Understand Fourier Series: Arbitrary period, Even and Odd Functions, Half-Range Expansions and Fourier Integrals.                                                                                                                                                             |
| CO5 | Understand Partial Differential equations, Solution by Separating Variables.                                                                                                                                                                                                  |
| CO6 | Understand the use of Fourier Series in solving PDE: D'Alembert's Solution of the Wave Equation. Characteristics and solving Heat Equation by Fourier Series.                                                                                                                 |
| CO7 | Understand Laplacian in Polar Coordinates                                                                                                                                                                                                                                     |

## **6B12 MAT: Numerical Methods, Fourier series and Partial Differential Equations**

### **Unit I- Interpolation (25 Hours)**

Interpolation with unevenly spaced points, Lagrange interpolation, Newton's divided differences interpolation, Finite difference operators and finite differences, Newton's interpolation formulae, Central difference interpolation. (Sections 4.2, 4.2.1, 4.2.3, 4.3.1, 4.3.2, 4.3.3 of Text 1).

### **Unit II - Numerical Solution of Differential Equations (25 Hours)**

Introduction, Picard's method, Solution by Taylor series method, Euler method, Runge-Kutta methods (Sections 7.1, 7.2, 7.3, 7.4, 7.5 of Text 1).

### **Unit III - Fourier Series (20 Hours)**

Fourier Series, Arbitrary period, Even and Odd Functions, Half-Range Expansions, Fourier Integrals (Sections 11.1, 11.2, 11.7 of Text 2).

### **Unit IV – Partial Differential Equations (20 Hours)**

Basic Concepts, Solution by Separating Variables. Use of Fourier Series, D'Alembert's Solution of the Wave Equation. Characteristics, Heat Equation: Solution by Fourier Series (Steady two-dimensional Heat problems, Laplace's equation, unifying power of methods, Electro statistics and Elasticity are excluded), Laplacian in Polar Coordinates (circular membrane, Bessel's equation are excluded). (Sections 12.1, 12.3, 12.4, 12.6, 12.10 of Text 2).

### **Texts**

1. S. R. K. Iyengar and R. K. Jain, Mathematical methods, Narosa Publishing House
2. E. Kreyzig, Advanced Engineering Mathematics (10<sup>th</sup> edition), John Wiley.

### **References**

1. V.N. Vedomurthy and N.Ch.S.N. Iyengar, Numerical Methods, Vikas Publishing House
2. S.S. Sastry, Introductory Methods of Numerical Analysis (5<sup>th</sup> edition), PHI
3. B.S. Grewal, Higher Engineering Mathematics (43<sup>rd</sup> edition), Khanna Publishers
4. S.S. Sastry, Engineering Mathematics , Vol 2 (4<sup>th</sup> edition), PHI

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 24                                | <b>48</b>     |
| II    | 24                                |               |
| III   | 16                                |               |
| IV    | 15                                |               |
| Total | <b>79</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
• *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)  
• *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)  
• *Answer any 2 questions* (2 questions x Marks 6 each = 12).

## CORE COURSE 13: LINEAR ALGEBRA

| SEMESTER  | COURSE CODE     | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|-----------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                 |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>VI</b> | <b>6B13 MAT</b> | <b>5</b>       | <b>4</b> | <b>3</b>   | <b>48</b>    | <b>12</b> | <b>60</b> |

### COURSE OUTCOMES

|     |                                                                                                                                                                 |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand the concept of Vector spaces, subspaces, linear combinations and system of equations.                                                                |
| CO2 | Understand the concept of Linear Dependence and Linear Independence, Bases and Dimension, Maximal Linearly Independent Subsets and solves problems.             |
| CO3 | Understand the concept of Linear Transformations, Null Spaces, and Ranges, The Matrix Representation of a Linear Transformation.                                |
| CO4 | Understand Rank of a matrix, Elementary transformations of a matrix, Invariance of rank through elementary transformations, Normal form, Elementary matrices.   |
| CO5 | Understand the concept System of linear homogeneous equations Null space and nullity of matrix, Range of a matrix, Systems of linear non homogeneous equations. |
| CO6 | Understand Eigen values, Eigen vectors, Properties of Eigen values, Cayley-Hamilton theorem.                                                                    |

## **6B13 MAT: Linear Algebra**

### **Unit I – Vector Spaces (20 Hours)**

Introduction, Vector spaces, Subspaces, Linear Combinations and Systems of Linear Equations (Sections 1.1, 1.2, 1.3 of Text 1).

### **Unit II – Bases and Dimension (20 Hours)**

Linear Dependence and Linear Independence, Bases and Dimension, Maximal Linearly Independent Subsets (Sections 1.5, 1.6, 1.7 of Text 1).

### **Unit III - Linear Transformations, Matrices (25 Hours)**

Linear Transformations, Null Spaces, and Ranges (Proof of Theorem 2.3 excluded), The Matrix Representation of a Linear Transformation (Sections 2.1, 2.2 of Text 1) (Operations of Linear Transformations and related theorems are excluded).

Introduction, Rank of a matrix, Elementary transformations of a matrix, Invariance of rank through elementary transformations, Elementary transformations of a matrix do not alter its rank, Multiplication of the elements of a row by a non zero number does not alter the rank, Addition to the elements of a row the products by a number of the corresponding elements of a row does not alter the rank, Reduction to normal form (Proof of theorem excluded), Elementary Matrices, Elementary Transformations and elementary matrices, Employment of only row (column) transformations, The rank of a product, A Convenient method for computing the inverse of a non singular matrix by elementary row transformations (Sections 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13 of Text 2).

### **Unit IV - System of linear equations, Eigen values and Eigen vectors (25 Hours)**

Introduction, System of linear homogeneous equations, Null space and nullity of matrix, Sylvester's law of nullity, Range of a matrix, Systems of linear non homogeneous equations (Sections 6.1, 6.2, 6.3, 6.4, 6.5, 6.6 of Text 2)

Eigen values, eigen vectors, Properties of eigen values, Cayley-Hamilton theorem(without proof). (Sections 2.13, 2.14, 2.15 of Text 3)

### **Texts**

1. S.H. Friedberg, A. J. Insel and L.E. Spence, Linear Algebra (4<sup>th</sup> edition), PH Inc
2. S. Narayan and Mittal, A Text Book of Matrices (Revised edition), S. Chand

- B.S. Grewal, Higher Engineering Mathematics (41<sup>st</sup> edition), Khanna Publishers.

### References

- R. Larson and D.C. Falvo, Elementary Linear Algebra ( 6<sup>th</sup> edition), Houghton Mifflin Harcourt Publishing Company
- J.R. Kirkwood and B.H. Kirkwood, Elementary Linear Algebra, CRC Press
- S. Kumaresan, Linear Algebra – A Geometrical approach, Prentice Hall of India
- S. Axler, Linear Algebra Done Right (3<sup>rd</sup> edition), Springer
- K. Hoffman and R. Kunze, Linear Algebra (2<sup>nd</sup> edition), PHI.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 18                                | <b>48</b>     |
| II    | 17                                |               |
| III   | 22                                |               |
| IV    | 22                                |               |
| Total | <b>79</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
 • *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
 • *Answer any 8 questions* (8 questions x Marks 2 each=16)
- Part C - Essay** (7 questions x Marks 4 each = 28)  
 • *Answer any 4 questions* ( 4 questions x Marks 4 each=16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)  
 • *Answer any 2 questions* ( 2 questions x Marks 6 each=12).

## DISCIPLINE SPECIFIC ELECTIVE COURSES

Discipline specific elective courses are:

1. **6B14A MAT: GRAPH THEORY**
2. **6B14B MAT: OPERATIONS RESEARCH**
3. **6B14C MAT: CRYPTOGRAPGY**
4. **6B14D MAT: FUZZY MATHEMATICS**
5. **6B14E MAT: PROGRAMMING IN PYTHON.**

*One* of the above courses is to be chosen as Discipline Specific Elective Course.

### DISCIPLINE SPECIFIC ELECTIVE COURSE 1: GRAPH THEORY

| SEMESTER  | COURSE CODE      | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                  |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>VI</b> | <b>6B14A MAT</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>48</b>    | <b>12</b> | <b>60</b> |

#### COURSE OUTCOMES

|     |                                                                                                                  |
|-----|------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand a graph, subgraph ,different types of graphs and their properties                                     |
| CO2 | Understand and represent graph as matrix                                                                         |
| CO3 | Understand a path, cycle, trees, bridges and their properties                                                    |
| CO4 | Understand cut vertices and connectivity of graphs                                                               |
| CO5 | Understand Eulerian graphs, Hamiltonian graphs, The Chinese Postman Problem and The Travelling Salesman Problem. |
| CO6 | Understand planar graphs, Euler’s formula, The Platonic bodies and Kuratowski’s Theorem                          |
| CO7 | Model real world problems using the concept of graphs                                                            |
| CO8 | Solve real world problems using the concept of graphs                                                            |

## **6B14A MAT: Graph Theory**

### **Unit I - An Introduction to Graphs (20 hours)**

The Definition of a graph, Graphs as models, More definitions, Vertex Degrees, Sub graphs , Matrix representation of graphs (Theorems omitted).  
(Sections 1.1, 1.2, 1.3, 1.4, 1.5, 1.7 of the Text).

### **Unit II - Trees and connectivity (25 hours)**

Paths and Cycles, Definition of trees and simple properties, Bridges, spanning trees, Cut vertices and connectivity.  
(Sections 1.6, 2.1, 2.2, 2.3, 2.6 of the Text).

### **Unit III - Euler Tour and Hamiltonian cycles (22 hours)**

Euler tours (Excluding Fleury's algorithm), The Chinese Postman Problem, Hamiltonian Graphs, The Travelling salesman Problem (Algorithm Omitted).  
(Sections 3.1, 3.2, 3.3, 3.4 of the Text).

### **Unit IV - Planar Graphs (23 hours)**

Plane and planar Graphs, Euler's formula, The platonic bodies, Kuratowski's theorem (Proof of Theorem 5.13 and 5.14 are omitted).  
(Sections 5.1, 5.2, 5.3, and 5.4).

### **Text**

J. Clark and D.A. Holton, A First Look at Graph Theory, Allied Publishers.

### **References**

1. R. Balakrishnan and K. Ranganathan, A Text Book of Graph Theory (2<sup>nd</sup> edition), Springer.
2. J.A. Bondy and U.S.R. Murthy, Graph Theory with Applications, Macmillan
3. F. Harary, Graph Theory, Narosa
4. K.R. Parthasarathy, Basic Graph Theory, Tata-McGraw Hill.
5. G. Chartrand and P. Zhang, Introduction to Graph Theory, Tata McGraw Hill



### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 19                                | 48            |
| II    | 21                                |               |
| III   | 19                                |               |
| IV    | 20                                |               |
| Total | 79                                |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
• *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)  
• *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)  
• *Answer any 2 questions* (2 questions x Marks 6 each = 12).

**DISCIPLINE SPECIFIC ELECTIVE COURSE 2:  
6B14B MAT: OPERATIONS RESEARCH**

| SEMESTER  | COURSE CODE      | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                  |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>VI</b> | <b>6B14B MAT</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>48</b>    | <b>12</b> | <b>60</b> |

**COURSE OUTCOMES**

|      |                                                                                                                                                                                                                                 |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1  | Understand convex sets, convex functions, their properties, local and global extrema and quadratic forms                                                                                                                        |
| CO2  | Understand LPP, formulate and solve using graphical method                                                                                                                                                                      |
| CO3  | Understand General LPP, canonical and standard forms of LPP                                                                                                                                                                     |
| CO4  | Understand simplex method and solve LPP                                                                                                                                                                                         |
| CO5  | Understand basic solution, degenerate solution, basic feasible solution, optimum basic feasible solution , fundamental properties of solution and simplex method                                                                |
| CO6  | Understand primal-dual pair, formulation of dual and duality theorems                                                                                                                                                           |
| CO7  | Understand LP formulation of transportation problem and its solution                                                                                                                                                            |
| CO8  | Understand Mathematical formulation of Assignment problem and Hungarian Assignment method                                                                                                                                       |
| CO9  | Understand problem of sequencing , Processing 'n' jobs through '2' machines, Processing 'n' jobs through 'k' machines                                                                                                           |
| CO10 | Understand basic terms in Game theory, The Maximin-Minimax Principle, Solution of game with saddle point, Solution of 2x2 game without saddle point, Graphic solution of 2xn and mx2 games and Arithmetic method for nxn Games. |

## **6B14B MAT: Operations Research**

### **Unit I - Linear Programming Problem (30 hours)**

Convex sets and their properties, Convex Functions, Local and Global Extrema, Quadratic Forms.

Linear Programming Problem – Mathematical formulation, Graphical solution, General Linear Programming Problem, Slack and Surplus Variables, Canonical and standard form of LPP, Insights into the simplex method.

Basic Solution, Degenerate Solution, Basic Feasible Solution, Associated cost vector, Improved basic Feasible solution, Optimum Basic Feasible Solution, Fundamental Properties of solution (Proof of theorems omitted), Simplex method – The computational Procedure, The Simplex Algorithm.

General Primal-Dual Pair, Formulating a dual problem (Sections 0:13, 0:15, 0:16, 0:17, 2:1, 2:2, 2:3, 2:4, 3:1, 3:2, 3:4, 3:5, 3:6, 4:1, 4:2, 4:3, 5:1, 5:2, 5:3 of the Text).

### **Unit II - Transportation Problem (25 hours)**

LP formulation of the Transportation Problem, Existence of solution in T.P, Duality in Transportation problem, The Transportation Table, Loops in Transportation Tables, Triangular basis in a T.P (proof of theorem Omitted), Solution of a Transportation problem, North-west corner Method, Least –Cost Method, VAM, Test For Optimality, Degeneracy in TP, MODI Method.

(Sections 10:1,10:2,10:3,10:4,10:5,10:6,10:7,10:8,10:9,10:10,10:12,10:13 of the Text)

### **Unit III - Assignment Problem and Sequencing Problem (20 hours)**

**Assignment Problem:** Mathematical Formulation of Assignment Problem, Hungarian Assignment Method.

**Sequencing Problem:** Problem of sequencing, Basic terms used in sequencing, Processing ‘n’ jobs through ‘2’ machines, Processing ‘n’ jobs through ‘k’ machines, Maintenance Crew Scheduling.

(Sections 11:1, 11:2, 11:3, 12:1, 12:2, 12:3, 12:4, 12:5, 12:7 of the Text)

### **Unit IV - Games and Strategies (15 hours)**

Two-person Zero-sum Games, Basic terms in Game theory, The Maximin-Minimax Principle, Solution of game with saddle point, Solution of 2x2 game without saddle point, Graphic solution of 2xn and mx2 games, Dominance Property, Modified Dominance Property, Arithmetic Method for nxn Games. (Proofs of all theorems in this unit are omitted).

(Sections 17:1, 17:2, 17:3, 17:4, 17:5, 17:6, 17:7, 17:8 of the Text)

**Text**

K. Swarup, P.K.Gupta and M. Mohan, Operations Research (18<sup>th</sup> edition), Sulthan Chand and Sons.

**References**

1. J.K. Sharma, Operations Research - Theory and Applications, McMillan
2. H.A. Thaha, Operations Research, An Introduction (8<sup>th</sup> edition), Prentice Hall
3. G. Hadley, Linear Programming, Oxford & IBH Publishing Company.

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 25                                | <b>48</b>     |
| II    | 22                                |               |
| III   | 18                                |               |
| IV    | 14                                |               |
| Total | <b>79</b>                         |               |

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1each = 5)  
 • *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
 • *Answer any 8 questions* (8 questions x Marks 2 each=16)
- Part C - Essay** (7 questions x Marks 4 each = 28)  
 • *Answer any 4 questions* ( 4 questions x Marks 4 each=16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)  
 • *Answer any 2 questions* ( 2 questions x Marks 6 each=12).

## DISCIPLINE SPECIFIC ELECTIVE COURSE 3: CRYPTOGRAPHY

| SEMESTER  | COURSE CODE      | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                  |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>VI</b> | <b>6B14C MAT</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>48</b>    | <b>12</b> | <b>60</b> |

### COURSE OUTCOMES

|            |                                                                                                                                                                                                                                               |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Understand Simple Cryptosystems namely, The Shift Cipher, The Substitution Cipher, The Affine Cipher, The Vigenere Cipher, The Hill Cipher, The Permutation Cipher and Stream Ciphers                                                         |
| <b>CO2</b> | Understand basics of Shannon's Theory, Elementary Probability Theory, Perfect Secrecy, Entropy, Huffman Encodings and Entropy, Properties of Entropy, Spurious Keys and unicity Distance, Product Cryptosystems.                              |
| <b>CO3</b> | Understand The Euclidean Algorithm, The Chinese Remainder Theorem                                                                                                                                                                             |
| <b>CO4</b> | Understand Legendre and Jacobi Symbols and quadratic residues                                                                                                                                                                                 |
| <b>CO5</b> | Understand The RSA System and Factoring (25 Hours): Introduction to Public-key Cryptography, The RSA Cryptosystem, Implementing RSA, Primality Testing, The Solovay-Strassen Algorithm, The Miller Rabin Algorithm, Square roots modulo $n$ . |

## **6B14C MAT: Cryptography**

### **Unit I - Some Simple Cryptosystems (20 Hours)**

Introduction, The Shift Cipher, The Substitution Cipher, The Affine Cipher, The Vigenere Cipher, The Hill Cipher, The Permutation Cipher, Stream Ciphers (Section 1.1 of Chapter 1 in the Text).

### **Unit II - Shannon's Theory (25 Hours)**

Introduction, Elementary Probability Theory, Perfect Secrecy, Entropy, Huffman Encodings and Entropy, Properties of Entropy, Spurious Keys and Unicity Distance, Product Cryptosystems (Chapter 2 in the Text).

### **Unit III - More on Number Theory (20 Hours)**

The Euclidean Algorithm, The Chinese Remainder Theorem, Other Useful Facts (Proof of Lagrange's theorem omitted), Legendre and Jacobi Symbols (Sections 5.2 and 5.4.1 of Chapter 5 in the Text).

### **Unit IV - The RSA System and Factoring (25 Hours)**

Introduction to Public-key Cryptography, The RSA Cryptosystem, Implementing RSA, Primality Testing, The Solovay-Strassen Algorithm, The Miller Rabin Algorithm, Square roots modulo  $n$  (Sections 5.1, 5.3, 5.4.2, 5.4.3, 5.5 of Chapter 5 in the Text).

### **Text**

Douglas R. Stinson, Cryptography: Theory and Practice- Third Edition, CRC Press, 2006.

### **References:**

1. David M. Burton, Elementary Number Theory- Seventh Edition, Mc Graw Hill
2. William Stallings, Cryptography and Network Security Principles and Practices- Fourth Edition, Prentice Hall
3. Christof Paar-Jan Pelzl, Understanding Cryptography- A Text for Students and Practitioners, Springer.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 19                                | 48            |
| II    | 21                                |               |
| III   | 19                                |               |
| IV    | 20                                |               |
| Total | 79                                |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
• *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)  
• *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)  
• *Answer any 2 questions* (2 questions x Marks 6 each = 12).

**DISCIPLINE SPECIFIC ELECTIVE COURSE 4:  
FUZZY MATHEMATICS**

| SEMESTER  | COURSE CODE      | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                  |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>VI</b> | <b>6B14D MAT</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>48</b>    | <b>12</b> | <b>60</b> |

**COURSE OUTCOMES**

|     |                                                                                                                                                                   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Fuzzy Subsets, L-fuzzy Sets, Visual representation of a Fuzzy Subset, Operations on Fuzzy Subsets, Empty Fuzzy Subset 0                                |
| CO2 | Understand Universal Fuzzy Subset, Disjoint Fuzzy Subsets, Disjunctive Sum                                                                                        |
| CO3 | Understand $\alpha$ Level Set, Properties of Fuzzy Subsets of a Set, Algebraic Product and Sum of Two Fuzzy Subsets, Properties Satisfied by Addition and Product |
| CO4 | Understand Cartesian Product of Fuzzy Subsets                                                                                                                     |
| CO5 | Understand Fuzzy Relations, Binary Fuzzy Relations, Binary Relations on a Single Set, Fuzzy Equivalence Relations                                                 |
| CO6 | Understand Fuzzy Subgroup, Fuzzy Subgroupoids                                                                                                                     |
| CO7 | Understand The Lattice of Fuzzy Subgroups, Fuzzy Subgroup, Fuzzy Subrings                                                                                         |



## **6B14D MAT: Fuzzy Mathematics**

### **Unit I - Fuzzy Subsets and Fuzzy Mappings I (25 hours)**

Introduction, Fuzzy Subsets, L-fuzzy Sets, Visual Representation of a Fuzzy Subset, Operations on Fuzzy Subsets, Empty Fuzzy Subset 0 and Universal Fuzzy Subset, Disjoint Fuzzy Subsets, Disjunctive Sum (Sections 1.1, 1.2, 1.5, 1.6, 1.7, 1.7.1, 1.7.2, 1.8 of Text 1).

### **Unit II - Fuzzy Subsets and Fuzzy Mappings II (23 hours)**

$\alpha$  Level Set, Properties of Fuzzy Subsets of a Set, Algebraic Product and Sum of Two Fuzzy Subsets, Properties Satisfied by Addition and Product, Cartesian Product of Fuzzy Subsets (Sections 1.9, 1.10, 1.11, 1.12, 1.13 in Text 1. Proof of theorems in Section 1.13 omitted).

### **Unit III - Fuzzy Relations (22 hours)**

Crisp and Fuzzy Relations, Binary Fuzzy Relations, Binary Relations on a Single Set, Fuzzy Equivalence Relations (Sections 5.1, 5.3, 5.4, 5.5 of Text 2).

### **Unit IV - Fuzzy Groups and Fuzzy Rings (20 hours)**

Introduction, Fuzzy Subgroup, Fuzzy Sub groupoids, The Lattice of Fuzzy Subgroups, Fuzzy Subgroup, Fuzzy Sub rings (Section 3.1, 3.2, 3.2.1, 3.2.2, 3.3.2, 3.5 except Theorems 3.5.2, 3.5.3, 3.5.4, 3.5.5 in Text 1).

### **Texts**

1. S. Nanda and N.R. Das, Fuzzy Mathematical Concepts, Narosa Pub. House
2. G.J. Klir and B Yuan, Fuzzy Sets and Fuzzy Logic: Theory and Applications.

### **References**

1. K.H. Lee, First Course on Fuzzy Theory and Applications, Springer-Verlag
2. H.J. Zimmermann, Fuzzy Set Theory-And Its Applications (2<sup>nd</sup> revised edition), Allied Publishers Limited.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 21                                | 48            |
| II    | 20                                |               |
| III   | 19                                |               |
| IV    | 19                                |               |
| Total | <b>79</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
• *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)  
• *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)  
• *Answer any 2 questions* (2 questions x Marks 6 each = 12).

## DISCIPLINE SPECIFIC ELECTIVE COURSE 5: PROGRAMMING IN PYTHON

| SEMESTER  | COURSE CODE      | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                  |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>VI</b> | <b>6B14E MAT</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>48</b>    | <b>12</b> | <b>60</b> |

### COURSE OUTCOMES

|     |                                                                                                                                                                                                                                                                                                                                                                         |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand the basics of Python Variables, Indentation in Python, Input, Output and Import Functions Operators                                                                                                                                                                                                                                                          |
| CO2 | Understand Python programming for numbers, Dictionaries and Mathematical functions                                                                                                                                                                                                                                                                                      |
| CO3 | Understand Flow Control, if, if..else, if ..else, Loops – for loop, Range Function, while, Section 3.3 Nested Loop, Break and Continue Statements in Python                                                                                                                                                                                                             |
| CO4 | Understand Data visualization – The Matplot lib Module, Plotting mathematical functions, Famous Curves, 2D plot using colors, Mesh grids, 3D Plots using Python                                                                                                                                                                                                         |
| CO5 | Understand Python programming for Solving equations using Newton-Raphson's Method, Bisection Method, Method of false position, Trapezoidal rule of Numerical Integration, Simpson's Three Eighth rule of Numerical Integration, Euler's Modified Method to solve first order differential equation, Runge-Kutta Method of Order 4, Lagrange's Method for Interpolation. |

## **6B14E MAT: Programming in Python**

### **Unit I (30 Hours)**

Features of Python, Variables, Indentation in Python, Input, Output and Import Functions, Operators, Numbers, List, Tuples, Set, Dictionaries, Mathematical Functions (Sections 1.1, 1.5, 1.7, 1.11, 1.12, 2.1, 2.3, 2.5, 2.6 of Text 1. 1.12.4 and 1.12.7 omitted).

### **Unit II (18 hours)**

Flow Control, if, if..else, Loops – for loop, Range Function, while, Nested Loop, Break and Continue Statements (Section 3.1, 3.2, 3.3, 3.4 of Text 1).

### **UNIT III (20 Hours)**

Data visualization – The Matplot lib Module, Plotting mathematical functions, Famous Curves, 2D plot using colors, Mesh grids, 3D Plots. (Relevant sections from Text 2).

### **Practicals ( 10 Programmes) ( 22 Hours)**

1. Solution of  $Ax = B$  using Doolittle method
2. Newton-Raphson's Method
3. Bisection Method
4. Method of false position
5. Trapezoidal rule of Numerical Integration
6. Simpson's Three Eighth rule of Numerical Integration
7. Euler's Modified Method to solve first order differential equation
8. Runge-Kutta Method of Order 4
9. Lagrange's Method for Interpolation
10. Taylor Series Method for initial value problems.

### **Texts**

1. Dr. Jeeva Jose, Taming Python by Programming, Khanna Publications
2. B.P. Ajith Kumar, Python for Education – Learning Mathematics and Physics using Python and writing them in Latex (Free download from [www.iuac.res.in/phoenix](http://www.iuac.res.in/phoenix)).

### **Reference**

- J. Kiusalaas, Numerical methods in Engineering with Python, Cambridge University Press.

### Marks including choice

| Unit  | Marks in End Semester Examination* |               |
|-------|------------------------------------|---------------|
|       | Aggregate Marks                    | Maximum Marks |
| I     | 25                                 | <b>48</b>     |
| II    | 14                                 |               |
| III   | 16                                 |               |
| IV    | 24                                 |               |
| Total | <b>79</b>                          | 48            |

*\*No End Semester Practical Examination shall be conducted for this course.*

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
• *Answer any 8 questions* (8 questions x Marks 2 each = 16)
- Part C - Essay** (7 questions x Marks 4 each = 28)  
• *Answer any 4 questions* (4 questions x Marks 4 each = 16)
- Part D - Long Essay** (4 questions x Marks 6 each = 24)  
• *Answer any 2 questions* (2 questions x Marks 6 each = 12).

## 6B15 MAT: PROJECT

A student of B.Sc. Mathematics should compulsorily do a project work on a topic of his/her choice and prepare a project dissertation for completing the B.Sc. Mathematics Programme. The project work should satisfy the following criteria.

1. The topic of study should not be a part of the existing syllabus. But it can be an extension of a topic of the syllabus.
2. After the completion of the study, the student shall submit a project dissertation to the university in typed form.
3. The dissertation should have at least 15 pages excluding the page of table of contents.
4. The dissertation can be prepared using any typesetting software like LaTeX, MS Word or Libre Office Writer.
5. The project work can be done individually if the student so wishes. It can be done as a group having maximum 3 students.
6. The dissertation should contain a Title Page, Certificate from the Project Guide/Supervisor countersigned by the Head of the Department, Table of Contents, Preface/Introduction and References.

### Evaluation of the project work and dissertation

#### 1. Internal Evaluation

Internal evaluation of the project has the following components.

| Sl. No. | Components                            | Percentage of marks allotted | Marks allotted |
|---------|---------------------------------------|------------------------------|----------------|
| 1       | Relevance of the topic and references | 20                           | 1.4            |
| 2       | Layout                                | 10                           | 0.7            |
| 3       | Content                               | 20                           | 1.4            |
| 4       | Presentation and Viva-voce*           | 50                           | 3.5            |
|         | <b>Total</b>                          | <b>100</b>                   | <b>7</b>       |

\*Presentation and Viva-voce are to be conducted individually even if the project is done as a group.

## 2. External Evaluation

External evaluation of the project has the following components.

| Sl. No.      | Components                                  | Percentage of marks | Marks allotted |
|--------------|---------------------------------------------|---------------------|----------------|
| 1            | Relevance and depth of the topic and layout | 25                  | 7              |
| 2            | Seminar presentation*                       | 25                  | 7              |
| 3            | Viva-voce*                                  | 50                  | 14             |
| <b>Total</b> |                                             | <b>100</b>          | <b>28</b>      |

\*Viva-voce and Seminar presentation are to be conducted individually even if the project is done as a group.

*The student should get a minimum of 40% of the aggregate marks and 40% separately for End Semester examination and 10% for CE for pass in the project.*

## **PART B**

### **MATHEMATICS COMPLEMENTARY ELECTIVE COURSES**

**FOR  
BSc PHYSICS, CHEMISTRY, STATISTICS, ELECTRONICS,  
COMPUTER SCIENCE AND BCA PROGRAMMES**

#### **WORK AND CREDIT DISTRIBUTION**

**( 2019 ADMISSION ONWARDS )**

#### **1. BSc PHYSICS PROGRAMME**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>         | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> |
|--------------------|-----------------------------|-----------------|-----------------------|---------------|-------------------|
| 1C01 MAT-PH        | MATHEMATICS FOR PHYSICS I   | I               | 4                     | 3             | 3                 |
| 2C02 MAT-PH        | MATHEMATICS FOR PHYSICS II  | II              | 4                     | 3             | 3                 |
| 3C03 MAT-PH        | MATHEMATICS FOR PHYSICS III | III             | 5                     | 3             | 3                 |
| 4C04 MAT-PH        | MATHEMATICS FOR PHYSICS IV  | IV              | 5                     | 3             | 3                 |

#### **2. BSc CHEMISTRY PROGRAMME**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>           | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> |
|--------------------|-------------------------------|-----------------|-----------------------|---------------|-------------------|
| 1C01 MAT-CH        | MATHEMATICS FOR CHEMISTRY I   | I               | 4                     | 3             | 3                 |
| 2C02 MAT-CH        | MATHEMATICS FOR CHEMISTRY II  | II              | 4                     | 3             | 3                 |
| 3C03 MAT-CH        | MATHEMATICS FOR CHEMISTRY III | III             | 5                     | 3             | 3                 |
| 4C04 MAT-CH        | MATHEMATICS FOR CHEMISTRY IV  | IV              | 5                     | 3             | 3                 |

#### **3. BSc STATISTICS PROGRAMME**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>            | <b>SEMESTER</b> | <b>HOURS PER WEEK</b> | <b>CREDIT</b> | <b>EXAM HOURS</b> |
|--------------------|--------------------------------|-----------------|-----------------------|---------------|-------------------|
| 1C01 MAT-ST        | MATHEMATICS FOR STATISTICS I   | I               | 4                     | 3             | 3                 |
| 2C02 MAT-ST        | MATHEMATICS FOR STATISTICS II  | II              | 4                     | 3             | 3                 |
| 3C03 MAT-ST        | MATHEMATICS FOR STATISTICS III | III             | 5                     | 3             | 3                 |
| 4C04 MAT-ST        | MATHEMATICS FOR STATISTICS IV  | IV              | 5                     | 3             | 3                 |



#### 4. BSc ELECTRONICS PROGRAMME

| COURSE CODE | COURSE TITLE                    | SEMESTER | HOURS PER WEEK | CREDIT | EXAM HOURS |
|-------------|---------------------------------|----------|----------------|--------|------------|
| 1C01 MAT-EL | MATHEMATICS FOR ELECTRONICS I   | I        | 4              | 3      | 3          |
| 2C02 MAT-EL | MATHEMATICS FOR ELECTRONICS II  | II       | 4              | 3      | 3          |
| 3C03 MAT-EL | MATHEMATICS FOR ELECTRONICS III | III      | 5              | 3      | 3          |
| 4C04 MAT-EL | MATHEMATICS FOR ELECTRONICS IV  | IV       | 5              | 3      | 3          |

#### 5. BSc COMPUTER SCIENCE PROGRAMME

| COURSE CODE | COURSE TITLE                         | SEMESTER | HOURS PER WEEK | CREDIT | EXAM HOURS |
|-------------|--------------------------------------|----------|----------------|--------|------------|
| 1C01 MAT-CS | MATHEMATICS FOR COMPUTER SCIENCE I   | I        | 4              | 3      | 3          |
| 2C02 MAT-CS | MATHEMATICS FOR COMPUTER SCIENCE II  | II       | 4              | 3      | 3          |
| 3C03 MAT-CS | MATHEMATICS FOR COMPUTER SCIENCE III | III      | 5              | 3      | 3          |
| 4C04 MAT-CS | MATHEMATICS FOR COMPUTER SCIENCE IV  | IV       | 5              | 3      | 3          |

#### 6. BCA PROGRAMME

| COURSE CODE  | COURSE TITLE            | SEMESTER | HOURS PER WEEK | CREDIT | EXAM HOURS |
|--------------|-------------------------|----------|----------------|--------|------------|
| 1C01 MAT-BCA | MATHEMATICS FOR BCA I   | I        | 4              | 4      | 3          |
| 2C02 MAT-BCA | MATHEMATICS FOR BCA II  | II       | 4              | 4      | 3          |
| 3C03 MAT-BCA | MATHEMATICS FOR BCA III | III      | 4              | 4      | 3          |
| 4C04 MAT-BCA | MATHEMATICS FOR BCA IV  | IV       | 4              | 4      | 3          |

### EVALUATION

| ASSESSMENT | WEIGHTAGE |
|------------|-----------|
| EXTERNAL   | 4         |
| INTERNAL   | 1         |

### INTERNAL ASSESSMENT

| COMPONENT                                             | WEIGHTAGE | MARKS     | REMARKS                                                                                                                                        |
|-------------------------------------------------------|-----------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------|
| COMPONENT1-<br>ASSIGNMENT /<br>SEMINAR /<br>VIVA-VOCE | 50%       | 5         | For each course, a student has to submit one assignment/<br>attend one seminar/<br>attend one viva-voce                                        |
| COMPONENT 2-<br>TEST PAPER                            | 50%       | 5         | For each course, a student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark. |
| TOTAL                                                 | 100%      | <b>10</b> |                                                                                                                                                |

- **Use of Scientific Calculators below 100 functions ( that is, upto fx 99) shall be permitted for all the above courses.**

## MATHEMATICS COMPLEMENTARY ELECTIVE COURSES FOR BSc PHYSICS PROGRAMME

### COMPLEMENTARY ELECTIVE COURSE 1:

### MATHEMATICS FOR PHYSICS I

| SEMESTER | COURSE CODE          | HOURS<br>PER<br>WEEK | CREDIT   | EXAM<br>HOURS | MARKS           |           |           |
|----------|----------------------|----------------------|----------|---------------|-----------------|-----------|-----------|
|          |                      |                      |          |               | END SEM<br>EXAM | INTERNAL  | TOTAL     |
| <b>I</b> | <b>1C01 MAT - PH</b> | <b>4</b>             | <b>3</b> | <b>3</b>      | <b>40</b>       | <b>10</b> | <b>50</b> |

### COURSE OUTCOMES

|     |                                                                                                                                                |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand the concept of Differentiation and successive differentiation.                                                                      |
| CO2 | Understand Fundamental theorem – Rolle’s theorem, Lagrange’s mean-value theorem, Cauchy’s mean-value theorem,.                                 |
| CO3 | Understand the Taylor’s theorem , expansions of functions – Maclaurin’s series, expansion by use of known series                               |
| CO4 | Understand the Matrices and System of Equations, Linear Transformations                                                                        |
| CO5 | Understand Rank of a matrix, elementary transformations, normal form of a matrix, inverse of a matrix, solution of linear system of equations. |
| CO6 | Understand Linear transformations, orthogonal transformation, vectors – linear dependence                                                      |
| CO7 | Understand Derivative of arc, curvature, Polar coordinates, Cylindrical and Spherical co-ordinates                                             |

## 1C01 MAT-PH: Mathematics for Physics I

### Unit I - Differential Calculus - Differentiation and successive differentiation (18 hours)

**Text: Differential Calculus, Shanti Narayan and P. K. Mittal**

*Quick review* of basics of differentiation – Derivatives of standard functions, rules of differentiation, parametric differentiation. (*Questions should not be asked in the End Semester Examinations from the above sections for quick review*) (Relevant portions from sections 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10).

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the  $n$ th derivative of the product of two functions (Sections 4.1, 4.2)

### Unit II - Differential Calculus – Applications of differential Calculus (18 hours)

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem, Cauchy's mean-value theorem, Taylor's theorem (Generalised mean value theorem)(without proof), expansions of functions – Maclaurin's series, expansion by use of known series, Taylor's series, Indeterminate forms - form  $0/0$ , form  $\infty/\infty$ , form reducible to  $0/0$  form - form  $0\cdot\infty$ , form  $\infty-\infty$ , forms  $0^0, 1^\infty, \infty^0$ . (Sections 4.3, 4.4, 4.5)

### Unit III - Linear Algebra – Matrices and System of Equations, Linear Transformations (20 hours)

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Rank of a matrix, elementary transformation of a matrix, equivalent matrix, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in  $n$  unknowns, system of linear homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence (Sections 2.7, 2.8, 2.9, 2.10, 2.11, 2.12)

**Unit IV - Curvature and Geometry****(16 hours)****Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**Derivative of arc, curvature (radius of curvature only for Cartesian curve  $y=f(x)$ ), centre of curvature

(Sections 4.9, 4.10, 4.11, 4.12)

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.**

Polar coordinates, Cylindrical and spherical co-ordinates

(Section 11.3, relevant portions from section 15.7).

**References**

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai.
2. Text of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company.
4. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley.
5. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India.

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 18                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 18                                |               |
| IV    | 14                                |               |
| Total | <b>66</b>                         |               |

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 7 questions* (7 questions x Marks 2 each = 14)
- Part C - Essay** (7 questions x Marks 3 each = 28)
- *Answer any 4 questions* (4 questions x Marks 3 each = 12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)
- *Answer any 2 questions* (2 questions x Marks 5 each = 10).

**COMPLEMENTARY ELECTIVE COURSE 2:  
MATHEMATICS FOR PHYSICS II**

| SEMESTER  | COURSE CODE          | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|----------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                      |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>II</b> | <b>2C02 MAT - PH</b> | <b>4</b>       | <b>3</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|     |                                                                                                                                                      |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand partial derivatives, homogeneous functions, Euler's theorem, total derivative, differentiation of implicit functions, change of variables |
| CO2 | Understand Integration and Integration by Successive Reduction , Integration of Trigonometric Functions                                              |
| CO3 | Comprehend Applications of Integration                                                                                                               |
| CO4 | Comprehend Eigen values, Eigen vectors, properties of Eigen values,                                                                                  |
| CO5 | Understand Cayley- Hamilton theorem, Diagonal form, similarity of matrices, powers of a matrix, canonical form, nature of a quadratic form           |

## 2C02 MAT-PH: Mathematics for Physics II

### Unit I - Differential Calculus – Partial Differentiation (18 hours)

**Text:** Differential Calculus, Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.

Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.

(Sections 5.1, 5.2, 5.4, 5.5, 5.6)

### Unit II - Integral Calculus - Integration and Integration by Successive Reduction (18 hours)

**Text:** Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.

*Quick review of basics of Integration (Questions should not be asked in the End Semester Examinations from the above sections for quick review)*

(Sections 8.1, 8.2, 8.3, 8.4, 8.5)

**Text:** Integral Calculus, Santhi Narayanan and P.K. Mittal

**Integration of Trigonometric Functions:** Integration of  $\sin^n x$  where  $n$  is a positive integer, Integration of  $\sin^n x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^n x dx$ , Integration of  $\cos^n x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \cos^n x dx$ , Integration of  $\sin^p x \cos^q x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x dx$ , integration of  $\tan^n x$ , integration of  $\cot^n x$ , integration of  $\sec^n x$ , integration of  $\operatorname{cosec}^n x$

(Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2)

### Unit III - Integral Calculus – Applications of Integration (18 hours)

**Text:** Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.

Substitutions and the area between curves, volumes using cross sections, arc length, areas of surfaces of revolution, areas and length in polar coordinates

(Section 5.6, 6.1, 6.3, 6.4, 11.5)

### Unit IV - Linear Algebra – Eigen Values and Cayley Hamilton Theorem (18 hours)

**Text:** Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices,

powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form.

(Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18).

### References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai.
2. Text of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company.
4. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley.
5. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 16                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 16                                |               |
| IV    | 18                                |               |
| Total | <b>66</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1each = 5)  
 • *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
 • *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 28)  
 • *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
 • *Answer any 2 questions* ( 2 questions x Marks 5 each=10).



## COMPLEMENTARY ELECTIVE COURSE 3:

### MATHEMATICS FOR PHYSICS III

| SEMESTER | COURSE CODE   | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|---------------|----------------|--------|------------|--------------|----------|-------|
|          |               |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| III      | 3C03 MAT - PH | 5              | 3      | 3          | 40           | 10       | 50    |

#### COURSE OUTCOMES

|     |                                                                  |
|-----|------------------------------------------------------------------|
| CO1 | Understand the concept of Multiple Integrals and solves problems |
| CO2 | Understand Vector Differentiation                                |
| CO3 | Understand Laplace Transforms and its Applications               |
| CO4 | Understand Fourier Series and Half range expansions              |

### 3C03 MAT-PH: Mathematics for Physics III

**Unit I - Integral Calculus – Multiple Integrals (26 hours)**  
**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.**

Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular co-ordinates, substitutions in multiple integrals  
(Sections 15.1, 15.2, 15.3, 15.4, 15.5, 15.8)

**Unit II - Vector Calculus – Vector Differentiation (22 hours)**  
**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.**

Lines and planes in space, curves in space and their tangents, curvature and normal vector of a curve, tangential and normal components of acceleration, directional derivatives and gradient vectors.  
(Sections 12.5, 13.1, 13.3 to 13.5, 14.5)

**Unit III - Laplace Transforms and its Applications (24 hours)**

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley.**

**Laplace Transforms:** Laplace Transform, Linearity, first shifting theorem (*s*-Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem (*t*- Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Systems of ODEs, Laplace Transform, General Formulas, Table of Laplace Transforms.

(Chapter 6 Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9)(Proofs are omitted)

**Unit IV - Fourier Series (18 hours)**

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley.**

**Fourier Series** Fourier series, arbitrary period, , Even and Odd functions, Half-range Expansions. (Proofs are omitted)

(Chapter 11 Sections 11.1, 11.2)

**References**

1. Introduction to Vector Analysis, H. F. Davis and Arthur David Snider, Universal Book Stall, New Delhi.
2. Vector Analysis, M. R. Spiegel, Schaum's Outline Series, Asian Student edition
3. Vector Calculus, F.W. Bedford and T.D. Dwivedi, McGraw Hill.
4. Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 18                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 18                                |               |
| IV    | 14                                |               |
| Total | <b>66</b>                         |               |

### **Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1each = 5)
- *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)
- *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 28)
- *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)
- *Answer any 2 questions* ( 2 questions x Marks 5 each=10).

**COMPLEMENTARY ELECTIVE COURSE 4:  
MATHEMATICS FOR PHYSICS IV**

| SEMESTER  | COURSE CODE          | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|----------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                      |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>IV</b> | <b>4C04 MAT - PH</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|            |                                                                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Understand Wave Equation, Solution by Separating Variables, D-Alembert's solution of the wave equation.                                             |
| <b>CO2</b> | Understand Heat Equation and Solution by Fourier Series                                                                                             |
| <b>CO3</b> | Understand Line integrals , path independence, conservative fields and potential functions, Green's theorem in the plane                            |
| <b>CO4</b> | Understand Surface area, surface integrals, Stoke's theorem, Divergence theorem                                                                     |
| <b>CO5</b> | Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule                                                                              |
| <b>CO6</b> | Understand Numerical Solutions of Ordinary Differential Equations by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods. |

## 4C04 MAT-PH: Mathematics for Physics IV

### **Unit I - Partial differential Equations (20 hours)**

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley.**

Basic Concepts, Modeling: Vibrating String, Wave Equation, Solution by Separating Variables, Use of Fourier Series, D'Alembert's solution of the wave equation, Heat Equation, Solution by Fourier Series.

(Chapter 12 sections 12.1, 12.2, 12.3, 12.4, 12.5, 12.6)

(*Excluding* steady two dimensional heat problems and Laplace equation of 12.5).

### **Unit II - Vector Calculus – Vector Integration (22 hours)**

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.**

Line integrals (mass, moment and moment of inertia are excluded), vector fields and line integrals: work, circulation and flux, path independence, conservative fields and potential functions, Green's theorem in the plane (Proof of Green's theorem is excluded)

(Sections 16.1, 16.2, 16.3, 16.4)

### **Unit III - Vector Calculus – Vector Integration (24 hours)**

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.**

Surfaces and area, surface integrals, Stoke's theorem, the divergence theorem and unified theory (Gauss's Law: One of the four great laws of Electromagnetic Theory, continuity equation of Hydrodynamics, Unifying the integral theorems are excluded) (Proofs of all theorems are excluded)

(Sections 16.5, 16.6, 16.7, 16.8)

### **Unit IV - Numerical Analysis (24 hours)**

**Text: Introductory Methods of Numerical Analysis (fifth edition), S.S. Sastry PHI Learning.**

**Numerical Integration:** Numerical Integration, Trapezoidal Rule, Simpson's 1/3- Rule

(Chapter 6 Sections 6.4, 6.4.1, 6.4.2)

**Numerical Solutions of Ordinary Differential Equations:** Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.

(Sections 8.1, 8.2, 8.4, 8.4.2, 8.5)

## References

1. Introduction to Vector Analysis, H. F. Davis and Arthur David Snider, Universal Book Stall, New Delhi.
2. Vector Analysis, M. R. Spiegel, Schaum's Outline Series, Asian Student edition
3. Vector Calculus, F.W. Bedford and T.D. Dwivedi, McGraw Hill.
4. Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.
5. Mathematical methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub.

## Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 16                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 16                                |               |
| IV    | 18                                |               |
| Total | <b>66</b>                         |               |

## Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (11 questions x Marks 2 each = 22)  
• *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 28)  
• *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
• *Answer any 2 questions* ( 2 questions x Marks 5 each=10).

## MATHEMATICS COMPLEMENTARY ELECTIVE COURSES FOR BSc CHEMISTRY PROGRAMME

### COMPLEMENTARY ELECTIVE COURSE 1: MATHEMATICS FOR CHEMISTRY I

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| I        | 1C01 MAT-CH | 4              | 3      | 3          | 40           | 10       | 50    |

#### Course outcomes

|            |                                                                                                                                                                                                                                                                                                           |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Understand Successive differentiation and Leibnitz's theorem for the nth derivative of the product of two functions                                                                                                                                                                                       |
| <b>CO2</b> | Understand Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem and Cauchy's mean value theorem.                                                                                                                                                                                          |
| <b>CO3</b> | Understand Taylor's theorem, expansions of functions – Maclaurin's series, expansion by use of known series and Taylor's series.                                                                                                                                                                          |
| <b>CO4</b> | Understand the method of finding limits of Indeterminate forms.                                                                                                                                                                                                                                           |
| <b>CO5</b> | Understand Polar, Cylindrical and Spherical co-ordinates.                                                                                                                                                                                                                                                 |
| <b>CO6</b> | Understand Rank of a matrix, elementary transformation of a matrix, equivalent matrices, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix and partition method of finding the inverse.                                                                            |
| <b>CO7</b> | Understand solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear homogeneous equations.       |
| <b>CO8</b> | Understand Linear transformations, orthogonal transformation and linear dependence of vectors.                                                                                                                                                                                                            |
| <b>CO9</b> | Understand methods of curve fitting, graphical method, laws reducible to the linear law, principles of least squares, method of least squares and apply the principle of least squares to fit the straight line $y=a+bx$ , to fit the parabola $y=a+bx+cx^2$ , to fit $y=ax^b$ , $y=ae^{bx}$ and $xy^n=b$ |

## 1C01 MAT-CH: Mathematics For Chemistry I

**Unit I - Differential Calculus - Differentiation and successive differentiation (18 hrs)**

**Text: Differential Calculus, Shanti Narayan and P.K. Mittal**

*Quick review* of basics of differentiation – Derivatives of standard functions, rules of differentiation, parametric differentiation. (*Questions should not be asked in the End Semester Examinations from the above sections for quick review*) (Relevant portions from sections 4.3,4.4,4.5,4.6,4.7, 4.8,4.9,4.10)

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the nth derivative of the product of two functions (Sections 4.1, 4.2)

**Unit II : Differential Calculus – Applications of Differentiation (18 hrs)**

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem, Cauchy's mean-value theorem, Taylor's theorem (Generalised mean value theorem)(without proof), expansions of functions – Maclaurin's series, expansion by use of known series, Taylor's series, Indeterminate forms - form  $0/0$ , form  $\infty/\infty$ , forms reducible to  $0/0$  form - form  $0 \cdot \infty$ , form  $\infty - \infty$ , forms  $0^0, 1^\infty, \infty^0$ .

**Unit III Linear Algebra – Matrices and System of Equations, Linear Transformations (20 hrs)**

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Rank of a matrix, elementary transformation of a matrix, equivalent matrix, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence (Sections 2.7, 2.8, 2.9, 2.10, 2.11, 2.12)



**Unit IV Curve Fitting****(16 hrs)****Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Introduction, graphical method, laws reducible to the linear law, principles of least squares, method of least squares, to fit the straight line  $y=a+bx$ , to fit the parabola  $y=a+bx+cx^2$  (Sections 24.1, 24.2, 24.3, 24.4, 24.5)

**References**

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Text of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company
4. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley
5. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India
6. Fundamentals of Mathematical Statistics, S.C. Gupta and V.K. Kapoor, Sultan Chand.

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 16                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 20                                |               |
| IV    | 14                                |               |
| Total | <b>66</b>                         |               |

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1each = 5)
- *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)
- *Answer any 4 questions* (4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)
- *Answer any 1 question* (2 questions x Marks 5each=10).

**COMPLEMENTARY ELECTIVE COURSE 2:  
MATHEMATICS FOR CHEMISTRY II**

| SEMESTER  | COURSE CODE        | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|--------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                    |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>II</b> | <b>2C02 MAT-CH</b> | <b>4</b>       | <b>3</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|     |                                                                                                                                                                                                                                                    |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Functions of two or more variables, limits and continuity.                                                                                                                                                                              |
| CO2 | Understand partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions and change of variables.                                                                  |
| CO3 | Understand Reduction formulae for trigonometric functions and evaluation of definite integrals $\int_0^{\frac{\pi}{2}} \sin^n x dx$ , $\int_0^{\frac{\pi}{2}} \cos^n x dx$ and $\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x dx$ .                     |
| CO4 | Understand Substitutions and the area between curves, arc length, areas and length in polar coordinates.                                                                                                                                           |
| CO5 | Understand Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form and triple integrals in rectangular co-ordinates.                                      |
| CO6 | Understand Eigen values, Eigen vectors, properties of Eigen values, Cayley- Hamilton theorem, reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form and nature of a quadratic form |

## 2C02 MAT-CH: Mathematics for Chemistry II

### Unit I - Differential Calculus – Partial Differentiation (18 hours)

**Text: Differential Calculus, Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.

(Sections 5.1, 5.2, 5.4, 5.5, 5.6)

### Unit II - Integral Calculus - Integration and Integration by Successive Reduction (18 hours)

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services**

**Quick review of basics of Integration (Questions should not be asked in the End Semester Examinations from the above sections for quick review)**

(Sections 8.1, 8.2, 8.3, 8.4, 8.5 )

**Text: Integral Calculus, Santhi Narayanan and P.K. Mittal**

**Integration of Trigonometric Functions:** Integration of  $\sin^n x$  where  $n$  is a positive integer, Integration of  $\sin^n x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^n x dx$ , Integration of  $\cos^n x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \cos^n x dx$ , Integration of  $\sin^p x \cos^q x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x dx$ , integration of  $\tan^n x$ , integration of  $\cot^n x$ , integration of  $\sec^n x$ , integration of  $\operatorname{cosec}^n x$

(Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2)

### Unit III - Integral Calculus – Applications of Integration and Multiple Integrals (20 hours)

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.**

Substitutions and the area between curves, arc length, polar coordinates, areas of surfaces of revolution, areas and length in polar coordinates (Section 5.6, 6.3, 11.3, 11.5).

Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular co-ordinates (Sections 15.1, 15.2, 15.3, 15.4, 15.5).

**Unit IV - Linear Algebra – Eigen Values****(16 hours)****Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form (Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18.)

**References**

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Text of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company
4. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley
5. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 16                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 20                                |               |
| IV    | 14                                |               |
| Total | <b>66</b>                         |               |

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
 • *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
 • *Answer any 7 questions* (7 questions x Marks 2 each = 14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
 • *Answer any 4 questions* (4 questions x Marks 3 each = 12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
*Answer any 2 questions* (2 questions x Marks 5 each = 10).

**COMPLEMENTARY ELECTIVE COURSE 3:  
MATHEMATICS FOR CHEMISTRY III**

| SEMESTER   | COURSE CODE        | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|------------|--------------------|----------------|----------|------------|--------------|-----------|-----------|
|            |                    |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>III</b> | <b>3C03 MAT-CH</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|     |                                                                                                                                                                                                                                                                                                                              |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Ordinary differential equations, Geometrical meaning of $y'=f(x, y)$ and Direction Fields.                                                                                                                                                                                                                        |
| CO2 | Understand Methods of solving Differential Equations: Separable ODEs, Exact ODEs, Integrating Factors, Linear ODEs and Bernoulli Equation.                                                                                                                                                                                   |
| CO3 | Understand Orthogonal Trajectories, Existence and Uniqueness of Solutions.                                                                                                                                                                                                                                                   |
| CO4 | Understand Second order ODEs, Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian, Nonhomogeneous ODEs and Solution by variation of Parameters                                     |
| CO5 | Understand Laplace Transform, Linearity, first shifting theorem, Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem, Convolution, Integral Equations, Differentiation and integration of Transforms and to solve special linear ODE's with variable coefficients and Systems of ODEs |
| CO6 | Understand Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions.                                                                                                                                                                                                                                  |

## 3CO3 MAT-CH: Mathematics for Chemistry III

### Unit I - First Order Ordinary Differential Equations (25 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig.**

Basic concepts, Geometrical meaning of  $y'=f(x, y)$ . Direction Fields (numerical method by Euler is excluded), Separable ODEs (modelling is excluded), Exact ODEs, Integrating Factors, Linear ODEs, Bernoulli Equation (population dynamics is excluded).

(Sections 1.1, 1.2, 1.3, 1.4, 1.5)

### Unit II: Second Order Ordinary Differential Equations (20 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley.**

Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian (statement of Theorems only, proofs omitted), Nonhomogeneous ODEs, Solution by variation of Parameters.

(Sections 2.1 to 2.10 *except* 2.4, 2.8 and 2.9)

### Unit III: Laplace Transforms and its Applications (25 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley.**

Laplace Transform, Linearity, first shifting theorem ( $s$ -Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem ( $t$ - Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Systems of ODEs, Laplace Transform, General Formulas, Table of Laplace Transforms.

(Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9 (Proofs are omitted))

### Unit IV Fourier Series (20 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley.**

Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions. (Proofs are omitted)

( Sections 11.1, 11.2 )

### References

1. Higher Engineering Mathematics (41<sup>st</sup> edition), B .S. Grewal, Khanna Pub.

2. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce and R.C. Deprima, Wiley
3. Differential Equations, S.L. Ross, Wiley
4. An Introduction to Ordinary Differential Equations, E.A. Coddington, Printice Hall
5. A Text of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 19                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 18                                |               |
| IV    | 13                                |               |
| Total | <b>66</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1each = 5)
- *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)
- *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)
- *Answer any 2 questions* ( 2 questions x Marks 5 each=10).

**COMPLEMENTARY ELECTIVE COURSE 4:  
MATHEMATICS FOR CHEMISTRY IV**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| IV       | 4C04 MAT-CH | 5              | 3      | 3          | 40           | 10       | 50    |

**COURSE OUTCOMES**

|     |                                                                                                                                                                               |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Partial Differential Equations, Modeling, Vibrating String, Wave Equation..                                                                                        |
| CO2 | Solve PDE by Separating Variables, by use of Fourier Series, D-Alembert's solution of the wave equation and Heat Equation.                                                    |
| CO3 | Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule                                                                                                        |
| CO4 | Understand Numerical methods to find Solutions of Ordinary Differential Equations: Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods. |
| CO5 | Understand volumes of solid using cross sections and areas of surfaces of revolution                                                                                          |



## 4C04 MAT-CH: Mathematics for Chemistry IV

### Unit I - Partial differential Equations (30 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley.**

Basic Concepts, Modeling: Vibrating String, Wave Equation, Solution by Separating Variables, Use of Fourier Series, D'Alembert's solution of the wave equation, Heat Equation, Solution by Fourier Series.

( sections 12.1, 12.2, 12.3, 12.4, 12.5, 12.6) (*Excluding* steady two dimensional heat problems and Laplace equation of 12.5).

### Unit II - Numerical Analysis (30 hrs)

**Text: Introductory Methods of Numerical Analysis (fifth edition), S.S. Sastry, PHI Learning**

**Numerical Integration** - Trapezoidal Rule, Simpson's 1/3-Rule

(Sections 6.4, 6.4.1, 6.4.2)

**Numerical Solutions of Ordinary Differential Equations:** Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.

(Sections 8.1, 8.2, 8.4, 8.4.2, 8.5)

### Unit III - Group Theory

**Text: Group Theory in Chemistry, M.S. Gopinathan and V. Ramakrishnan, Vishal Pub. Co. (30 hrs)**

Symmetry elements and symmetry operations: Identity, rotation, reflection, improper rotation and inversion.

**Group theory** - Definition of group, order of a group, classes and similarity transformations, point group classifications, subgroups- group multiplication table. Matrix representation of symmetry operations – rotation, reflection, identity.

(Sections 1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.2).

### References

1. Higher Engineering Mathematics (41<sup>st</sup> edition), B .S. Grewal, Khanna Pub.
2. Mathematical methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub.
3. Molecular Symmetry and Group Theory, Robert L. Carter, Wiley.
4. Chemical Applications of Group Theory (3<sup>rd</sup> edition), F. Albert Cotton, Wiley

5. Group Theory and Symmetry in Chemistry, Gurudeep Raj, Ajay Bhagi and Vinod Jain, Krishna Prakashan Media.

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 22                                | <b>40</b>     |
| II    | 22                                |               |
| III   | 22                                |               |
| Total | <b>66</b>                         |               |

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 7 questions* (7 questions x Marks 2 each = 14)
- Part C - Essay** (7 questions x Marks 3 each = 21)
- *Answer any 4 questions* (4 questions x Marks 3 each = 12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)
- *Answer any 2 questions* (2 questions x Marks 5 each = 10).

# MATHEMATICS COMPLEMENTARY ELECTIVE COURSES FOR BSc STATISTICS PROGRAMME

## COMPLEMENTARY ELECTIVE COURSE 1: MATHEMATICS FOR STATISTICS I

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| I        | 1C01 MAT-ST | 4              | 3      | 3          | 40           | 10       | 50    |

### COURSE OUTCOMES

|     |                                                                                                                                                                                                                                   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Differentiation and Successive Differentiation                                                                                                                                                                         |
| CO2 | Understand Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the nth derivative of the product of two Sections                                          |
| CO3 | Understand Applications of Differentiation                                                                                                                                                                                        |
| CO5 | Understand Matrices and System of Equations, Linear Transformations                                                                                                                                                               |
| CO6 | Understand Lines and planes in space, curves in space and their tangents, curvature and normal vector of a curve, tangential and normal components of acceleration, directional derivative, gradient vectors, divergence and curl |

## 1C01 MAT-ST: Mathematics for Statistics I

### **Unit I- Differential Calculus - Differentiation and Successive Differentiation (16 hours)**

**Text: Differential Calculus, Shanti Narayan and P.K. Mittal**

**Quick review** of basics of differentiation – Derivatives of standard functions, rules of differentiation, parametric differentiation. **(Questions should not be asked in the End Semester Examinations from the above sections for quick review).** Relevant portions from sections 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the  $n^{\text{th}}$  derivative of the product of two functions.

(Sections 4.1, 4.2)

### **Unit II- Differential Calculus – Applications of Differentiation (20 hours)**

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem, Cauchy's mean-value theorem, Taylor's theorem (Generalised mean value theorem)(without proof), expansions of functions – Maclaurin's series, expansion by use of known series, Taylor's series.

Indeterminate forms - form  $0/0$ , form  $\infty/\infty$ , forms reducible to  $0/0$  form - form  $0 \cdot \infty$ , form  $\infty - \infty$ , forms  $0^0$ ,  $1^\infty$ ,  $\infty^0$

(Sections 4.3, 4.4, 4.5)

### **Unit III- Linear Algebra - Matrices and System of Equations, Linear Transformations (20 hours)**

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Rank of a matrix, elementary transformation of a matrix, equivalent matrices elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in  $n$  unknowns, system of linear homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence

(Sections 2.7, 2.8, 2.9, 2.10, 2.11, 2.12)

**Unit IV- Vector Differential Calculus (16 hours)**

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.**

Lines and planes in space, curves in space and their tangents, curvature and normal vector of a curve, tangential and normal components of acceleration, directional derivatives and gradient vectors (Sections 12.5, 13.1, 13.3, 13.4, 13.5, 14.5)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley.**

Divergence and curl (Sections 9.8 and 9.9)

**Reference**

1. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India
2. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand
3. Introduction to Vector Analysis, H. F. Davis and Arthur David Snider, Universal Book Stall, New Delhi.
4. Vector Analysis, M. R. Spiegel, Schaum's Outline Series, Asian Student edition
5. Vector Calculus, F.W. Bedford and T.D. Dwivedi, McGraw Hill.

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 17                                | 40            |
| II    | 20                                |               |
| III   | 17                                |               |
| IV    | 12                                |               |
| Total | 66                                |               |

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
• *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
• *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
• *Answer any 2 questions* ( 2 questions x Marks 5 each=10).

## COMPLEMENTARY ELECTIVE COURSE 2: MATHEMATICS FOR STATISTICS II

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| II       | 2C02 MAT-ST | 4              | 3      | 3          | 40           | 10       | 50    |

### COURSE OUTCOMES

|     |                                                                                                                                                                                                                                                                |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Partial Differentiation: Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables |
| CO2 | Understand Integration and Integration by Successive Reduction, Integration of Trigonometric Functions                                                                                                                                                         |
| CO3 | Understand Applications of Integration and Multiple Integrals                                                                                                                                                                                                  |
| CO4 | Understand Eigen Values and Eigen vectors, Cayley-Hamilton Theorem                                                                                                                                                                                             |

## 2C02 MAT-ST: Mathematics for Statistics II

### Unit I- Differential Calculus - Partial Differentiation (17 hours)

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal**

Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.

(Sections 5.1, 5.2, 5.4, 5.5, 5.6)

### Unit II- Integral Calculus – Integration and Integration by Successive Reduction (17 hours)

**Text: Integral Calculus, Santhi Narayanan and P.K. Mittal, S. Chand**

Quick review of basics of Integration (*Questions should **not** be asked in the End Semester Examinations from the above sections for quick review*)

(Sections 8.1, 8.2, 8.3, 8.4, 8.5)

Integration of Trigonometric Functions: Integration of  $\sin^n x$  where  $n$  is a positive integer, Integration of  $\sin^n x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^n x dx$ , Integration of  $\cos^n x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \cos^n x dx$ , Integration of  $\sin^p x \cos^q x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x dx$ , integration of  $\tan^n x$ , integration of  $\cot^n x$ , integration of  $\sec^n x$ , integration of  $\operatorname{cosec}^n x$   
 (Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2)

### **Unit III Integral Calculus – Applications of Integration and Multiple Integrals (20 hours)**

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services, 2016**

Substitutions and the area between curves, arc length, areas and length in polar coordinates (Section 5.6, 6.3, 11.5)

Multiple Integrals- Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular co-ordinates, triple integrals in cylindrical and spherical co-ordinates, substitutions in multiple integrals  
 (Sections 15.1, 15.2, 15.3, 15.4, 15.5, 15.7, 15.8)

### **Unit IV**

#### **Linear Algebra – Eigen Values and Cayley-Hamilton Theorem (18 hours)**

**Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.**

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form

(Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18)

### **Reference**

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India
3. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co
4. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 17                                | <b>40</b>     |
| II    | 17                                |               |
| III   | 20                                |               |
| IV    | 12                                |               |
| Total | <b>66</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 7 questions* (7 questions x Marks 2 each = 14)
- Part C - Essay** (7 questions x Marks 3 each = 21)
- *Answer any 4 questions* (4 questions x Marks 3 each = 12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)
- *Answer any 2 questions* (2 questions x Marks 5 each = 10).



**COMPLEMENTARY ELECTIVE COURSE 3:  
MATHEMATICS FOR STATISTICS III**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| III      | 3C03 MAT-ST | 5              | 3      | 3          | 40           | 10       | 50    |

**COURSE OUTCOMES**

|     |                                                                                                                                                                               |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Geometrical meaning of First order ordinary differential equation $y'=f(x, y)$ . Direction Fields , Separable ODEs , Exact ODEs, Linear ODEs, Bernoulli Equation   |
| CO2 | Understand Homogeneous Linear ODEs of second order, Differential Operators, Euler-Cauchy Equation, Wronskian solution by variation of Parameters                              |
| CO3 | Understand Laplace Transform, first shifting theorem ,Transforms of Derivatives and Integrals, unit step Function, Convolution, General Formulas, Table of Laplace Transforms |
| CO4 | Understand Fourier series, arbitrary period, , Even and Odd functions, Half-range Expansions                                                                                  |

## 3C03 MAT-ST: Mathematics for Statistics III

### Unit I- First Order Ordinary Differential Equations (24 hours)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig , Wiley**

Basic concepts, Geometrical meaning of  $y'=f(x, y)$ . Direction Fields (numerical method by Euler excluded), Separable ODEs (modelling is excluded), Exact ODEs, Integrating Factors, Linear ODEs, Bernoulli Equation (population dynamics is excluded)

Chapter 1 Sections 1.1, 1.2, 1.3, 1.4, 1.5

### Unit II- Second Order Ordinary Differential Equations (24 hours)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley**

Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian (statement of Theorems only, proofs are omitted), Nonhomogeneous ODEs, Solution by variation of Parameters. Sections 2.1 to 2.10 except 2.4, 2.8 and 2.9

### Unit III- Laplace Transforms and its Applications (24 hours)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley**

Laplace Transform, Linearity, first shifting theorem ( $s$ -Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem ( $t$ - Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Systems of ODEs, Laplace Transform, General Formulas, Table of Laplace Transforms.

Chapter 6 Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9 (Proofs of theorems are omitted)

### Unit IV Fourier Series (18 hours)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley**

Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions. (Proofs are omitted)

Chapter 11 Sections 11.1, 11.2

### References

1. Higher Engineering Mathematics (41<sup>st</sup> edition), B .S. Grewal, Khanna Pub.

2. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce and R.C. Deprima, Wiley
3. Differential Equations, S.L. Ross, Wiley
4. An Introduction to Ordinary Differential Equations, E.A. Coddington, Printice Hall
5. A Textbook of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 18                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 18                                |               |
| IV    | 14                                |               |
| Total | <b>66</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1each = 5)
- *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)
- *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)
- *Answer any 2 questions* ( 2 questions x Marks 5 each=10).

**COMPLEMENTARY ELECTIVE COURSE 4:  
MATHEMATICS FOR STATISTICS IV**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| IV       | 4C04 MAT-ST | 5              | 3      | 3          | 40           | 10       | 50    |

**COURSE OUTCOMES**

|     |                                                                                                                                    |
|-----|------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Partial Differential Equations ,Basic Concepts, solution by separation of variables                                     |
| CO2 | Understand Solution of Algebraic and Transcendental Equation : Bisection Method, Method of false position, Newton-Raphson Method   |
| CO3 | Understand Finite differences , forward differences, Backward differences, Interpolation, Divided differences and their properties |
| CO4 | Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule                                                             |
| CO5 | Understand Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta method                                |
| CO6 | Understand Volume and Surface Area of Revolution                                                                                   |

## **4C04 MAT-ST: Mathematics for Statistics IV**

### **Unit I- Partial Differential Equations (18 hours)**

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley**

Basic Concepts, solution by separation of variables, use of Fourier series  
Sections 12.1, 12.3

### **Unit II- Numerical Analysis (28 hours)**

**Text: Introductory Methods of Numerical Analysis (5<sup>th</sup> edition), S.S. Sastry, PHI Learning.**

Solution of Algebraic and Transcendental Equation: Introduction, Bisection Method, Method of false position, Newton-Raphson Method

Chapter 2 Sections 2.1, 2.2, 2.3 and 2.5

Finite Differences and Interpolation: Introduction, finite differences - forward differences, Backward differences, Interpolation with unevenly spaced points  
Newton's formulae for interpolation, Interpolation with unevenly spaced points - Lagrange's interpolation formula, Divided differences and their properties, Newton's general interpolation formula

Sections 3.1, 3.3, 3.3.1, 3.3.2, 3.6, 3.9, 3.9.1, 3.10, 3.10.1

### **Unit III- Numerical Analysis (26 hours)**

**Text: Introductory Methods of Numerical Analysis (5<sup>th</sup> edition), S.S. Sastry, PHI Learning**

Numerical Integration - Trapezoidal Rule, Simpson's 1/3-Rule

Chapter 6 Sections 6.4, 6.4.1, 6.4.2

Numerical Solutions of Ordinary Differential Equations: Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.

Sections 8.1, 8.2, 8.4, 8.4.2, 8.5

### **Unit IV- Integral Calculus – Volume and Surface Area of Revolution (18 hours)**

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.**

Volumes using cross sections, areas of surfaces of revolution.

Sections 6.1, 6.4

## References

1. Higher Engineering Mathematics (41<sup>st</sup> edition), B .S. Grewal, Khanna Pub
2. Mathematical methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub.
3. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India
4. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai

## Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 13                                | <b>40</b>     |
| II    | 20                                |               |
| III   | 20                                |               |
| IV    | 13                                |               |
| Total | <b>66</b>                         |               |

## Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)
- *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)
- *Answer any 2 questions* ( 2 questions x Marks 5 each=10).

# MATHEMATICS COMPLEMENTARY ELECTIVE COURSES FOR BSc ELECTRONICS PROGRAMME

## COMPLEMENTARY ELECTIVE COURSE 1: MATHEMATICS FOR ELECTRONICS I

| SEMESTER | COURSE CODE        | HOURS<br>PER<br>WEEK | CREDIT   | EXAM<br>HOURS | MARKS           |           |           |
|----------|--------------------|----------------------|----------|---------------|-----------------|-----------|-----------|
|          |                    |                      |          |               | END SEM<br>EXAM | INTERNAL  | TOTAL     |
| <b>I</b> | <b>1C01 MAT-EL</b> | <b>4</b>             | <b>3</b> | <b>3</b>      | <b>40</b>       | <b>10</b> | <b>50</b> |

### COURSE OUTCOMES

|     |                                                                                                                                                                                   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand functions of two or more variables, limits, continuity, partial derivatives,.                                                                                          |
| CO2 | Understand homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables                          |
| CO3 | Understand lines , planes curves in space , their tangents, curvature and normal, tangential and normal components of acceleration, directional derivatives and gradient vectors. |
| CO4 | Understand Rank of a matrix, elementary transformation of a matrix, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, |
| CO5 | Understand Cramer's rule, matrix inversion method to find solution of linear system of equations                                                                                  |
| CO6 | Understand Rouche's theorem, procedure to test the consistency of a system of equations                                                                                           |
| CO7 | Understand linear transformations, orthogonal transformation,                                                                                                                     |
| CO8 | Understand linear dependence and independence.                                                                                                                                    |
| CO9 | Understand Probability distributions and curve fitting                                                                                                                            |

# 1C01 MAT-EL: Mathematics for Electronics I

## Unit I - Differential Calculus

(16 hours)

**Text: Differential Calculus, Shanti Narayan and P.K. Mittal**

**Quick review** of basics of differentiation – Derivatives of standard functions, rules of differentiation, parametric differentiation. (*Questions should not be asked in the End Semester Examinations from the above sections for quick review*)

(Relevant portions from sections 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10)

**Text: Differential Calculus, Higher Engineering Mathematics (41<sup>th</sup> edition), B.S. Grewal, Khanna Pub**

**Partial Differentiation:** Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.

(Sections 5.1, 5.2, 5.4, 5.5, 5.6)

## Unit II - Vector Differentiation and Geometry

(16 hours)

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services**

Lines and planes in space, curves in space and their tangents, curvature and normal vector of a curve, tangential and normal components of acceleration, directional derivatives and gradient vectors.

(Sections 12.5, 13.1, 13.3, 13.4, 13.5, 14.5)

## Unit III: Linear Algebra – Matrices and System of Equations, Linear Transformations

(25 hours)

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub**

Rank of a matrix, elementary transformation of a matrix, equivalent matrices, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in  $n$  unknowns, system of linear



homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence

(Sections 2.7, 2.8, 2.9, 2.10, 2.11, 2.12)

**Unit IV: Probability distributions and curve fitting (15 hours)**

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Introduction, graphical method, laws reducible to the linear law, principles of least squares, method of least squares, to fit the straight line  $y=a+bx$ , to fit the parabola  $y=a+bx+cx^2$ , fitting of  $y=ax^b$ ,  $y=ae^{bx}$ ,  $xy^n=b$

(Sections 24.1, 24.2, 24.3, 24.4, 24.5)

Random variable, Discrete probability distribution, continuous probability distribution, expectation, variance,  $r^{\text{th}}$  moment, mean deviation from mean.

(Sections 26.7, 26.8, 26.9, 26.10)

**References**

1. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley
2. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India
3. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand and Co.
4. Introduction to Vector Analysis, H. F. Davis and Arthur David Snider, Universal Book Stall, New Delhi.
5. Vector Analysis, M. R. Spiegel, Schaum's Outline Series, Asian Student edition
6. Vector Calculus, F.W. Bedford and T.D. Dwivedi, McGraw Hill.
7. Fundamentals of Mathematical Statistics, S.C. Gupta and V.K. Kapoor, Sultan Chand

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 16                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 20                                |               |
| IV    | 14                                |               |
| Total | <b>66</b>                         |               |

### **Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 7 questions* (7 questions x Marks 2 each = 14)
- Part C - Essay** (7 questions x Marks 3 each = 21)
- *Answer any 4 questions* (4 questions x Marks 3 each = 12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)
- *Answer any 2 questions* (2 questions x Marks 5 each = 10).

## COMPLEMENTARY ELECTIVE COURSE 2: MATHEMATICS FOR ELECTRONICS II

| SEMESTER  | COURSE CODE        | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|--------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                    |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>II</b> | <b>2C02 MAT-EL</b> | <b>4</b>       | <b>3</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

### COURSE OUTCOMES

|     |                                                                                                                   |
|-----|-------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand the reduction formulae to integrate powers of trigonometric functions                                  |
| CO2 | Understand the method to find area between curves, arc length both in Polar and Cartesian coordinates             |
| CO3 | Understand the method of evaluating multiple integrals                                                            |
| CO4 | Understand the concept of eigen values and eigen vectors, properties of eigen values and Cayley- Hamilton theorem |
| CO5 | Understand reduction to diagonal form and reduction of quadratic form to canonical form.                          |
| CO6 | Understand line integrals in vector fields and Green's theorem in the plane                                       |
| CO7 | Understand Surfaces and area, surface integrals, Stoke's theorem, the divergence theorem and unified theory       |

## 2C02 MAT-EL: Mathematics for Electronics II

### **Unit I - Integral Calculus – Integration and Integration by Successive Reduction (18 hours)**

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services, 2016**

Quick review of basics of Integration (*Questions should **not** be asked in the End Semester Examinations from the above sections for quick review*)

**Text: Integral Calculus, Santhi Narayanan and P.K. Mittal**

**Integration of Trigonometric Functions:** Integration of  $\sin^n x$  where  $n$  is a positive integer, Integration of  $\cos^n x$  where  $n$  is a positive integer, Integration of  $\sin^p x \cos^q x$  where  $p, q$  are positive integers, Integration of  $\tan^n x$  and  $\cot^n x$  where  $n$  is a positive integer, Integration of  $\sec^n x$  where  $n$  is a positive integer. (Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2)

### **Unit II - Integral Calculus – Applications of Integration and Multiple Integrals (18 hours)**

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services**

Substitutions and the area between curves, arc length, Polar coordinates, areas and length in polar coordinates  
(Section 5.6, 6.3, 11.3, 11.5)

Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular co-ordinates.  
(Sections 15.1, 15.2, 15.3, 15.4, 15.5)

### **Unit III Linear Algebra (18 hours)**

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form  
(Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18)

**Unit IV Vector Calculus – Vector Integration****(18 hours)****Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services**

Line integrals (mass, moment and moment of inertia excluded), vector fields and line integrals: work, circulation and flux, path independence, conservative fields and potential functions, Green's theorem in the plane.

(Sections 16.1, 16.2, 16.3, 16.4)

Surfaces and area, surface integrals, Stoke's theorem (theorem without proof) (paddle wheel interpretation of  $\nabla \times \mathbf{F}$  is excluded), the Divergence Theorem (theorem without proof) (Gauss' law: one of the four great laws of Electromagnetic Theory, continuity equation of hydrodynamics and unifying the integral theorems are excluded).

(Sections 16.5, 16.6, 16.7, 16.8 of the Text).

**References**

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley
3. Introduction to Vector Analysis, H. F. Davis and Arthur David Snider, Universal Book Stall, New Delhi.
4. Vector Analysis, M. R. Spiegel, Schaum's Outline Series, Asian Student edition
5. Vector Calculus, F.W. Bedford and T.D. Dwivedi, McGraw Hill.
6. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 16                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 18                                |               |
| IV    | 16                                |               |
| Total | <b>66</b>                         |               |

### **Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 7 questions* (7 questions x Marks 2 each = 14)
- Part C - Essay** (7 questions x Marks 3 each = 21)
- *Answer any 4 questions* (4 questions x Marks 3 each = 12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)
- *Answer any 2 questions* (2 questions x Marks 5 each = 10).

**COMPLEMENTARY ELECTIVE COURSE 3:  
MATHEMATICS FOR ELECTRONICS III**

| SEMESTER   | COURSE CODE        | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|------------|--------------------|----------------|----------|------------|--------------|-----------|-----------|
|            |                    |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>III</b> | <b>3C03 MAT-EL</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|      |                                                                                                                                                           |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1  | Understand Separable ODEs, Exact ODEs, Linear ODEs, Bernoulli equation and methods to solve these ODEs                                                    |
| CO2  | Understand Homogeneous Linear ODEs of Second Order and solve homogeneous linear ODEs of second order with constant coefficients and Euler-Cauchy equation |
| CO3  | Understand Nonhomogeneous ODEs and solve by variation of parameters                                                                                       |
| CO4  | Understand Laplace Transform and inverse Laplace Transformation                                                                                           |
| CO5  | Understand The first and The second shifting theorems and their applications                                                                              |
| CO6  | Understand the methods to find Laplace transforms of derivatives and integrals of functions                                                               |
| CO7  | Understand the method of differentiating and integrating Laplace transform                                                                                |
| CO8  | Understand convolution, convolution theorem and applications of convolution Theorem                                                                       |
| CO9  | Solve ordinary differential equations and integral equations using Laplace transform                                                                      |
| CO10 | Understand Fourier series and Fourier Transform                                                                                                           |

## 3C03 MAT-EL: Mathematics for Electronics III

### Unit I - First Order Ordinary Differential Equations (26 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig**

Basic concepts, Geometrical meaning of  $y'=f(x,y)$ . Direction Fields (numerical method by Euler excluded), Separable ODEs (modelling excluded) Exact ODEs, Integrating Factors, Linear ODEs, Bernoulli Equation (population dynamics excluded) (Sections 1.1, 1.2, 1.3, 1.4, 1.5)

### Unit II - Second Order Ordinary Differential Equations (22 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley**

Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian (statement of Theorems only, proofs omitted), Nonhomogeneous ODEs, Solution by variation of Parameters.

(Sections 2.1 to 2.10 *except* 2.4, 2.8 and 2.9)

### Unit III - Laplace Transforms and its Applications (24 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley**

**Laplace Transforms:** Laplace Transform, Linearity, first shifting theorem ( $s$ -Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem ( $t$ - Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Systems of ODEs, Laplace Transform, General Formulas, Table of Laplace Transforms.

(Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9 (Proofs omitted))

### Unit IV Fourier Series and Fourier Transforms (18 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley**

Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions. (Proofs are omitted) (Sections 11.1, 11.2)



Fourier integral, Fourier cosine and sine transform (discrete only), Inverse transform (Sections 11.7, 11.8, 11.9. Convolution is excluded).

### References

1. Higher Engineering Mathematics (41<sup>st</sup> edition), B .S. Grewal, Khanna Pub.
2. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce and R.C. Deprima, Wiley
3. Differential Equations, S.L. Ross, Wiley
4. An Introduction to Ordinary Differential Equations, E.A. Coddington, Printice Hall
5. A Textbook of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 19                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 17                                |               |
| IV    | 14                                |               |
| Total | <b>66</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1each = 5)  
 • *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
 • *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
 • *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
*Answer any 2 questions* ( 2 questions x Marks 5 each=10).

**COMPLEMENTARY ELECTIVE COURSE 4:  
MATHEMATICS FOR ELECTRONICS IV**

| SEMESTER  | COURSE CODE        | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|--------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                    |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>IV</b> | <b>4C04 MAT-EL</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|     |                                                                                                                                                                 |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Partial Differential equations, its solution by Separating Variables and the use of Fourier Series in solving PDE                                    |
| CO2 | Understand LPP, formulate and solve using graphical method                                                                                                      |
| CO3 | Understand General LPP, canonical and standard forms of LPP                                                                                                     |
| CO4 | Understand simplex method and solve LPP                                                                                                                         |
| CO5 | Understand basic solution, degenerate solution, basic feasible solution, optimum basic feasible solution, fundamental properties of solution and simplex method |
| CO6 | Understand LP formulation of transportation problem and method to solve                                                                                         |
| CO7 | Understand the concept of Numerical Integration, Trapezoidal Rule, Simpson's 1/3 Rule                                                                           |
| CO8 | Understand Taylor's series method, Euler's method, Modified Euler's method and Runge-Kutta methods to solve ordinary differential equations.                    |

## **4C04 MAT-EL: Mathematics for Electronics IV**

### **Unit I - Partial differential Equations (20 hrs)**

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley**

Basic Concepts, solution by separation of variables, use of Fourier series  
(Sections 12.1, 12.3)

### **Unit II - Linear Programming (25 hrs)**

**Text: Operations Research (18<sup>th</sup> thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.**

Mathematical formulation of daily life situations – simple cases only  
(Questions should be avoided for end semester examination) Canonical and standard form, Graphical solution method, Simplex method – computational procedure (Proof of theorems excluded)  
(Sections 2.1, 2.2, 2.3, 2.4, 3.2, 4.3)

### **Unit III Linear Programming (20 hrs)**

**Text: Operations Research (18<sup>th</sup> thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.**

Transportation problem – introduction, transportation table, loops, solution to a Transportation Problem, finding an initial basic feasible solution, transportation algorithm (MODI method) (Proofs of theorems are excluded)  
(Sections 10.5, 10.6, 10.8, 10.9, 10.13)

### **Unit IV Numerical Analysis (25 hrs)**

**Text: Introductory Methods of Numerical Analysis (fifth edition), S.S. Sastry, PHI Learning**

**Numerical Integration-** Trapezoidal Rule, Simpson's 1/3 -Rule.  
(Sections 6.4, 6.4.1, 6.4.2)

**Numerical Solutions of Ordinary Differential Equations:** Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods. (Sections 8.1, 8.2, 8.4, 8.4.2, 8.5)

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 12                                | <b>40</b>     |
| II    | 19                                |               |
| III   | 16                                |               |
| IV    | 19                                |               |
| Total | <b>66</b>                         |               |

### References

1. Higher Engineering Mathematics (41<sup>st</sup> edition), B .S. Grewal, Khanna Pub
2. Linear Programming, G. Hadley, Oxford & IBH Publishing Company, New Delhi.
3. Operations Research, S. Kalavathy, Vikas Pub.
4. Mathematical Methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub.

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
• *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
• *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
• *Answer any 2 questions* ( 2 questions x Marks 5 each=10).

**MATHEMATICS**  
**COMPLEMENTARY ELECTIVE COURSES FOR**  
**BSc COMPUTER SCIENCE PROGRAMME**

**COMPLEMENTARY ELECTIVE COURSE 1:**  
**MATHEMATICS FOR COMPUTER SCIENCE I**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| I        | 1C01 MAT-CS | 4              | 3      | 3          | 40           | 10       | 50    |

**COURSE OUTCOMES**

|            |                                                                                                                                                                                                                                                                                                                |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Understand Successive differentiation and Leibnitz's theorem for the nth derivative of the product of two functions                                                                                                                                                                                            |
| <b>CO2</b> | Understand Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem and Cauchy's mean value theorem.                                                                                                                                                                                               |
| <b>CO3</b> | Understand Taylor's theorem, expansions of functions – Maclaurin's series, expansion by use of known series and Taylor's series.                                                                                                                                                                               |
| <b>CO4</b> | Understand the method of finding limits of Indeterminate forms.                                                                                                                                                                                                                                                |
| <b>CO5</b> | Understand Polar, Cylindrical and Spherical co-ordinates.                                                                                                                                                                                                                                                      |
| <b>CO6</b> | Understand Rank of a matrix, elementary transformation of a matrix, equivalent matrices, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix and partition method of finding the inverse.                                                                                 |
| <b>CO7</b> | Understand solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear homogeneous equations.            |
| <b>CO8</b> | Understand Linear transformations, orthogonal transformation and linear dependence of vectors.                                                                                                                                                                                                                 |
| <b>CO9</b> | Understand methods of curve fitting, graphical method, laws reducible to the linear law, principles of least squares, method of least squares and apply the principle of least squares to fit the straight line $y = a+bx$ , to fit the parabola $y=a+bx+cx^2$ , to fit $y = ax^b$ , $y =ae^{bx}$ and $xy^n=b$ |

# 1C01 MAT-CS: Mathematics for Computer Science I

## Unit I Differential Calculus – Differentiation and Successive Differentiation (18 Hours)

**Text: Differential Calculus, Shanti Narayan and P.K. Mittal**

**Quick review** of basics of differentiation – Derivatives of standard functions, rules of differentiation, parametric differentiation. (*Questions should not be asked in the End Semester Examinations from the above sections for quick review*)(Relevant portions from sections 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10)

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal,**

Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the nth derivative of the product of two Sections 4.1, 4.2

## Unit II: Differential Calculus – Applications of Derivatives (22 Hours)

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem, Cauchy's mean-value theorem, Taylor's theorem (Generalised mean value theorem)(without proof), expansions of functions – Maclaurin's series, expansion by use of known series, Taylor's series, Indeterminate forms - form  $0/0$ , form  $\infty/\infty$ , form reducible to  $0/0$  form - form  $0.\infty$ , form  $\infty-\infty$ , forms  $0^0, 1^\infty, \infty^0$  (Sections 4.3, 4.4, 4.5).

## Unit III Linear Algebra - Matrices and System of Equations, Linear Transformations (20 Hours)

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Rank of a matrix, elementary transformation of a matrix, equivalent matrix, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence  
Sections 2.8, 2.9, 2.10, 2.11, 2.12, 2.13

## Unit IV Fitting of Curves

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Introduction, graphical method, laws reducible to the linear law, principles of least squares, method of least squares, to fit the straight line  $y=a+bx$ , to fit the parabola  $y=a+bx+cx^2$

Sections 24.1, 24.2, 24.3, 24.4, 24.5

### References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company
4. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley
5. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India
6. Fundamentals of Mathematical Statistics, S.C. Gupta and V.K. Kapoor, Sultan Chand

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 18                                | <b>40</b>     |
| II    | 20                                |               |
| III   | 18                                |               |
| IV    | 10                                |               |
| Total | <b>66</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
• *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
• *Answer any 4 questions* (4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
• *Answer any 2 questions* (2 questions x Marks 5 each=10).

**COMPLEMENTARY ELECTIVE COURSE 2:  
MATHEMATICS FOR COMPUTER SCIENCE II**

| SEMESTER  | COURSE CODE        | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|--------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                    |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>II</b> | <b>2C02 MAT-CS</b> | <b>4</b>       | <b>3</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|            |                                                                                                                                                                                                                                                    |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Understand Functions of two or more variables, limits and continuity.                                                                                                                                                                              |
| <b>CO2</b> | Understand partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions and change of variables.                                                                  |
| <b>CO3</b> | Understand Reduction formulae for trigonometric functions and evaluation of definite integrals $\int_0^{\frac{\pi}{2}} \sin^n x \, dx$ , $\int_0^{\frac{\pi}{2}} \cos^n x \, dx$ and $\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x \, dx$ .            |
| <b>CO4</b> | Understand Substitutions and the area between curves, arc length, areas and length in polar coordinates.                                                                                                                                           |
| <b>CO5</b> | Understand Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form and triple integrals in rectangular co-ordinates.                                      |
| <b>CO6</b> | Understand Eigen values, Eigen vectors, properties of Eigen values, Cayley- Hamilton theorem, reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form and nature of a quadratic form |



## 2C02 MAT-CS: Mathematics for Computer Science II

### Unit I Differential Calculus – Partial Differentiation

**Text:** Differential Calculus, Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.

**Partial Differentiation:** Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.

Sections 5.1, 5.2, 5.4, 5.5, 5.6

### Unit II Integral Calculus – Integration and Integration by Successive Reduction

**Text:** Integral Calculus, Santhi Narayanan and P.K. Mittal, S. Chand and Co.

*Quick review of basics of Integration (Questions should **not** be asked in the End Semester Examinations from the above sections for quick review)*

Sections 8.1, 8.2, 8.3, 8.4, 8.5

**Integration of Trigonometric Functions:** Integration of  $\sin^n x$ , where  $n$  is a positive integer, evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^n x dx$ , Integration of  $\cos^n x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \cos^n x dx$ , Integration of  $\sin^p x \cos^q x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x dx$ , integration of  $\tan^n x$ , integration of  $\cot^n x$ , integration of  $\sec^n x$ , integration of  $\operatorname{cosec}^n x$

Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2

### Unit III Integral Calculus – Applications of Integration and Multiple Integrals

**Text:** Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services

Substitutions and the area between curves, arc length, Polar coordinates, areas and length in polar coordinates

Section 5.6, 6.3, 11.3, 11.5

Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular co-ordinates

Sections 15.1, 15.2, 15.3, 15.4, 15.5

## Unit IV Linear Algebra - Eigen Values and Cayley-Hamilton Theorem

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal**

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form

Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18.

### References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company
4. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley
5. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 17                                | 40            |
| II    | 20                                |               |
| III   | 17                                |               |
| IV    | 12                                |               |
| Total | 66                                |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
• *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
• *Answer any 4 questions* (4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
• *Answer any 2 questions* (2 questions x Marks 5 each=10).

**COMPLEMENTARY ELECTIVE COURSE 3:  
MATHEMATICS FOR COMPUTER SCIENCE III**

| SEMESTER   | COURSE CODE        | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|------------|--------------------|----------------|----------|------------|--------------|-----------|-----------|
|            |                    |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>III</b> | <b>3C03 MAT-CS</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|            |                                                                                                                                                                                                                                                                                                                              |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Understand Ordinary differential equations, Geometrical meaning of $y'=f(x, y)$ and Direction Fields.                                                                                                                                                                                                                        |
| <b>CO2</b> | Understand Methods of solving Differential Equations: Separable ODEs, Exact ODEs, Integrating Factors, Linear ODEs and Bernoulli Equation.                                                                                                                                                                                   |
| <b>CO3</b> | Understand Orthogonal Trajectories, Existence and Uniqueness of Solutions.                                                                                                                                                                                                                                                   |
| <b>CO4</b> | Understand Second order ODEs, Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian, Non homogeneous ODEs and Solution by variation of Parameters                                    |
| <b>CO5</b> | Understand Laplace Transform, Linearity, first shifting theorem, Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem, Convolution, Integral Equations, Differentiation and integration of Transforms and to solve special linear ODE's with variable coefficients and Systems of ODEs |
| <b>CO6</b> | Understand Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions.                                                                                                                                                                                                                                  |
| <b>CO7</b> | Understand Partial Differential Equations and to solve PDEs by separation of variables and by use of Fourier series.                                                                                                                                                                                                         |

## 3C03 MAT-CS: Mathematics for Computer Science III

### Unit I First Order Ordinary Differential Equations

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, 2015**

Basic concepts, Geometrical meaning of  $y'=f(x, y)$ . Direction Fields (numerical method by Euler excluded), Separable ODEs (modelling excluded) Exact ODEs, Integrating Factors, Linear ODEs, Bernoulli Equation (population dynamics excluded) Chapter 1 Sections 1.1, 1.2, 1.3, 1.4, 1.5

### Unit II: Second Order Ordinary Differential Equations

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley, 2015**

Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian (statement of Theorems only, proofs omitted), Non homogeneous ODEs, Solution by variation of Parameters.

Sections 2.1 to 2.10 *except* 2.4, 2.8 and 2.9

### Unit III: Laplace Transforms and its Applications

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley**

**Laplace Transforms:** Laplace Transform, Linearity, first shifting theorem ( $s$ -Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem ( $t$ - Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Systems of ODEs, Laplace Transform, General Formulas, Table of Laplace Transforms.

Chapter 6 Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9 (Proofs omitted)

### Unit IV Fourier Series and Partial Differential Equations

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley**

Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions. (Proofs omitted)

Chapter 11 Sections 11.1, 11.2

Partial Differential Equations - Basic Concepts, solution by separation of variables, use of Fourier series Sections 12.1, 12.3

### References

1. Higher Engineering Mathematics (41<sup>st</sup> edition), B .S. Grewal, Khanna Pub.

2. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce and R.C. Deprima, Wiley
3. Differential Equations, S.L. Ross, Wiley
4. An Introduction to Ordinary Differential Equations, E.A. Coddington, Printice Hall
5. A Textbook of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 18                                | <b>40</b>     |
| II    | 15                                |               |
| III   | 15                                |               |
| IV    | 18                                |               |
| Total | <b>66</b>                         |               |

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1each = 5)  
 • *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
 • *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
 • *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
 • *Answer any 2 questions* ( 2 questions x Marks 5 each=10).

**COMPLEMENTARY COURSE 4:  
MATHEMATICS FOR COMPUTER SCIENCE IV**

| SEMESTER  | COURSE CODE        | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|--------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                    |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>IV</b> | <b>4C04 MAT-CS</b> | <b>5</b>       | <b>3</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|            |                                                                                                                                                                                                                    |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Understand the concept of a graph, graphs as models, vertex degrees, sub graphs, paths and cycles, matrix representation of graphs, trees and connectivity – definition and simple properties.                     |
| <b>CO2</b> | Understand Linear Programming Problems, their canonical and standard forms.                                                                                                                                        |
| <b>CO3</b> | Understand Methods to solve LPP : Graphical solution method and Simplex method                                                                                                                                     |
| <b>CO4</b> | Understand Transportation problems, transportation table, loops. Solve a Transportation Problem by finding an initial basic feasible solution and then by using the transportation algorithm known as MODI method. |
| <b>CO5</b> | Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule                                                                                                                                             |
| <b>CO6</b> | Understand Numerical methods to find Solutions of Ordinary Differential Equations: Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.                                      |

## **4C04 MAT-CS: Mathematics for Computer Science IV**

### **Unit I**

**Text: A First Look at Graph Theory, John Clark and Derek Allan Holton, Allied Pub.**

The definition of a graph, graphs as models, More definitions (problems on isomorphism excluded), vertex degrees, subgraphs, paths and cycles, matrix representation of graphs, trees and connectivity – definition and simple properties (Proofs of theorems 2.1, 2.2, 2.3, 2.5 and that of corollary 2.4 are excluded) (Problems involving proofs are excluded)

Sections 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1

### **Unit II Linear Programming**

**Text: Operations Research (18<sup>th</sup> thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.**

Mathematical formulation of daily life situations – simple cases only (Questions should be avoided for end semester examination from this topic)

Canonical and standard form, Graphical solution method, Simplex method – computational procedure (Proofs of theorems are excluded)

Sections 2.1, 2.2, 2.3, 2.4, 3.2, 4.3

### **Unit III Linear programming**

**Text: Operations Research (18<sup>th</sup> thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.**

Transportation problem – introduction, transportation table, loops, solution to a Transportation Problem, finding an initial basic feasible solution, transportation algorithm (MODI method)

(Proofs of theorems excluded)

Sections 10.5, 10.6, 10.8, 10.9, 10.13

### **Unit IV Numerical Analysis**

**Text: Introductory Methods of Numerical Analysis (fifth edition), S.S. Sastry PHI Learning**

#### **Numerical Integration-**

Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule

Chapter 6 Sections 6.4, 6.4.1, 6.4.2

**Numerical Solutions of Ordinary Differential Equations:** Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.

Sections 8.1, 8.2, 8.4, 8.4.2, 8.5

## References

1. Introduction to Graph Theory, F. Harary, Narosa Pub.
2. Graph Theory with Applications, J.A. Bondy and U.S.R. Murty, Macmillan
3. Linear Programming, G. Hadley, Oxford & IBH Publishing Company, New Delhi.
4. Operations Research, S. Kalavathy, Vikas Pub.
5. Mathematical Methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub.

## Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 16                                | 40            |
| II    | 18                                |               |
| III   | 16                                |               |
| IV    | 16                                |               |
| Total | 66                                |               |

## Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
• *Answer any 7 questions* (7 questions x Marks 2 each = 14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
• *Answer any 4 questions* (4 questions x Marks 3 each = 12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
• *Answer any 2 questions* (2 questions x Marks 5 each = 10).



**MATHEMATICS  
COMPLEMENTARY ELECTIVE COURSES FOR  
BCA PROGRAMME**

**COMPLEMENTARY ELECTIVE COURSE 1:  
MATHEMATICS FOR BCA I**

| SEMESTER | COURSE CODE         | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|----------|---------------------|----------------|----------|------------|--------------|-----------|-----------|
|          |                     |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>I</b> | <b>1C01 MAT-BCA</b> | <b>4</b>       | <b>4</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|      |                                                                                                                                                                                                                                                                                                     |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO 1 | Understand differentiation, derivative of functions namely constant function, trigonometric function, inverse trigonometric functions, $y = \log x$ , hyperbolic functions and parametrically defined function, Logarithmic differentiation and derivative of implicitly defined functions.         |
| CO 2 | Understand Successive differentiation and Leibnitz's theorem for the nth derivative of the product of two functions.                                                                                                                                                                                |
| CO 3 | Understand Basics of Boolean Algebra: Definition, duality and basic theorems.                                                                                                                                                                                                                       |
| CO 4 | Understand Rank of a matrix, elementary transformation of a matrix, equivalent matrices, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix and partition method of finding the inverse.                                                                      |
| CO 5 | Understand solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear homogeneous equations. |
| CO 6 | Understand Linear transformations, orthogonal transformation and linear dependence of vectors.                                                                                                                                                                                                      |

# 1C01 MAT-BCA: Mathematics for BCA I

## Unit I - Differential Calculus – Differentiation

**Text: Differential Calculus, Shanti Narayan and P.K. Mittal**

Basics of differentiation – Derivative of a constant function, some general theorems on derivation (theorems without proof), derivatives of trigonometric functions, derivatives of inverse trigonometric functions, derivative of  $y = \log x$ , hyperbolic functions, derivation of parametrically defined functions, logarithmic differentiation, derivation of implicitly defined functions.

(Sections 4.2, 4.3 except 4.3.5, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10)

## Unit II - Differential Calculus– Successive Differentiation

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal**

Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the  $n$ th derivative of the product of two functions

(Sections 4.1, 4.2)

## Unit III - Boolean Algebra

**Text: Set Theory and Related Topics, S. Lipschitz, Schaum's Series**

Introduction, basic definition, duality, basic theorems

(Sections 11.1, 11.2, 11.3, 11.4)

## Unit IV - Linear Algebra - Matrices and System of Equations, Linear Transformations

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal**

Rank of a matrix, elementary transformation of a matrix, equivalent matrix, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in  $n$  unknowns, system of linear homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence

(Sections 2.7, 2.8, 2.9, 2.10, 2.11, 2.12)

## References

1. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley
2. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India
3. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co

4. Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.
5. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 15                                | <b>40</b>     |
| II    | 17                                |               |
| III   | 13                                |               |
| IV    | 21                                |               |
| Total | <b>66</b>                         |               |

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
 • *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
 • *Answer any 7 questions* (7 questions x Marks 2 each = 14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
 • *Answer any 4 questions* (4 questions x Marks 3 each = 12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
 • *Answer any 2 questions* (2 questions x Marks 5 each = 10).

**COMPLEMENTARY ELECTIVE COURSE 2:  
MATHEMATICS FOR BCA II**

| SEMESTER  | COURSE CODE         | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|---------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                     |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>II</b> | <b>2C02 MAT-BCA</b> | <b>4</b>       | <b>4</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|     |                                                                                                                                                                                                                                                    |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Functions of two or more variables, limits and continuity.                                                                                                                                                                              |
| CO2 | Understand partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions and change of variables.                                                                  |
| CO3 | Understand basics of integration, Integration by parts, trigonometric integrals, trigonometric substitutions and integration of rational functions by partial fractions.                                                                           |
| CO4 | Understand Polar co-ordinates.                                                                                                                                                                                                                     |
| CO5 | Understand Reduction formulae for trigonometric functions and evaluation of definite integrals $\int_0^{\frac{\pi}{2}} \sin^n x dx$ , $\int_0^{\frac{\pi}{2}} \cos^n x dx$ and $\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x dx$ .                     |
| CO6 | Understand Double and Iterated Integrals over rectangles, double integrals over general regions and triple integrals in rectangular co-ordinates.                                                                                                  |
| CO7 | Understand Eigen values, Eigen vectors, properties of Eigen values, Cayley- Hamilton theorem, reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form and nature of a quadratic form |

## 2C02 MAT-BCA: Mathematics for BCA II

### Unit I- Differential Calculus - Partial Differentiation

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal**

Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.

(Sections 5.1, 5.2, 5.4, 5.5, 5.6)

### Unit II - Integral Calculus – Integration and Integration by Successive Reduction

**Text: Integral Calculus, Santhi Narayanan and P.K. Mittal, S. Chand**

Basics of Integration – Integration by parts, trigonometric integrals, trigonometric substitutions, integration of rational functions by partial fractions (Sections 8.1, 8.2, 8.3, 8.4, 8.5)

**Integration of Trigonometric Functions:** Integration of  $\sin^n x$  where  $n$  is a positive integer,

Integration of  $\sin^n x$ , evaluation of the definite integral  $\int_0^{\frac{\pi}{2}} \sin^n x dx$ ,

Integration of  $\cos^n x$ , evaluation of the definite integral

$\int_0^{\frac{\pi}{2}} \cos^n x dx$ , Integration of  $\sin^p x \cos^q x$ , evaluation of the definite integral

$\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x dx$ , integration of  $\tan^n x$  (Derivation of formulae omitted)

(Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1)

### Unit III Integral Calculus – Multiple Integrals

**Text: Thomas' Calculus (12<sup>th</sup> edition), Maurice D. Weir and Joel Hass, Pearson India Education Services, 2016**

Polar co-ordinates, Double and Iterated Integrals over rectangles, double integrals over general regions, triple integrals in rectangular co-ordinates

(Sections 11.3, 15.1, 15.2, 15.5)

### Unit IV - Linear Algebra - Eigen Values and Cayley-Hamilton Theorem (22 hrs)

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal**

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form,

(Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18)

## References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Calculus (10<sup>th</sup> edition), Anton, Bivens, Davis, Wiley-India
3. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co
4. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company
5. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley

## Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 16                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 16                                |               |
| IV    | 18                                |               |
| Total | <b>66</b>                         |               |

## Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
• *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
• *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
• *Answer any 2 questions* ( 2 questions x Marks 5 each=10).

**COMPLEMENTARY ELECTIVE COURSE 3:  
MATHEMATICS FOR BCA III**

| SEMESTER   | COURSE CODE         | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|------------|---------------------|----------------|----------|------------|--------------|-----------|-----------|
|            |                     |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>III</b> | <b>3C03 MAT-BCA</b> | <b>4</b>       | <b>4</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|     |                                                                                                                                                                                                                                                                                                                              |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand Ordinary differential equations, Geometrical meaning of $y'=f(x, y)$ and Direction Fields.                                                                                                                                                                                                                        |
| CO2 | Understand Methods of solving Differential Equations: Separable ODEs, Exact ODEs, Integrating Factors, Linear ODEs and Bernoulli Equation.                                                                                                                                                                                   |
| CO3 | Understand Second order ODEs, Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian and Nonhomogeneous ODEs.                                                                         |
| CO4 | Understand Laplace Transform, Linearity, first shifting theorem, Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem, Convolution, Integral Equations, Differentiation and integration of Transforms and to solve special linear ODE's with variable coefficients and Systems of ODEs |
| CO5 | Understand Fourier series, arbitrary period and Even and Odd functions                                                                                                                                                                                                                                                       |

## 3C03 AMT-BCA: Mathematics for BCA III

### Unit I - First Order Ordinary Differential Equations (22 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley, 2015**

Basic concepts, Geometrical meaning of  $y'=f(x, y)$ . Direction Fields (numerical method by Euler excluded), Separable ODEs (modelling excluded) Exact ODEs, Integrating Factors, Linear ODEs, Bernoulli Equation (population dynamics excluded)

(Sections 1.1, 1.2, 1.3, 1.4, 1.5)

### Unit II - Second Order Ordinary Differential Equations (16 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley, 2015**

Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian (statement of theorems only, proof omitted), Nonhomogeneous ODEs.

(Sections 2.1 to 2.9 *except* 2.4, 2.8)

### Unit III - Laplace Transforms and its Applications (20 hrs)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley, 2015**

Laplace Transform, Linearity, first shifting theorem ( $s$ -Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem ( $t$ - Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Laplace Transform, General Formulas, Table of Laplace Transforms.

(Chapter 6 Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.8, 6.9 (Proofs omitted))

### Unit IV Fourier Series (14 hours)

**Text: Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley, 2015**

Fourier series, arbitrary period, Even and Odd functions. (Proofs omitted)

(Chapter 11 Sections 11.1, 11.2 (half range expansions excluded))

### References

1. Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.
2. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce and R.C. Deprima, Wiley



3. Differential Equations, S.L. Ross, Wiley
4. An Introduction to Ordinary Differential Equations, E.A. Coddington, Printice Hall
5. A Textbook of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 20                                | <b>40</b>     |
| II    | 16                                |               |
| III   | 16                                |               |
| IV    | 14                                |               |
| Total | <b>66</b>                         |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1each = 5)  
 • *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
 • *Answer any 7 questions* (7 questions x Marks 2 each=14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
 • *Answer any 4 questions* ( 4 questions x Marks 3 each=12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
 • *Answer any 2 questions* ( 2 questions x Marks 5 each=10).

**COMPLEMENTARY ELECTIVE COURSE 4:  
MATHEMATICS FOR BCA IV**

| SEMESTER  | COURSE CODE         | HOURS PER WEEK | CREDIT   | EXAM HOURS | MARKS        |           |           |
|-----------|---------------------|----------------|----------|------------|--------------|-----------|-----------|
|           |                     |                |          |            | END SEM EXAM | INTERNAL  | TOTAL     |
| <b>IV</b> | <b>4C04 MAT-BCA</b> | <b>4</b>       | <b>4</b> | <b>3</b>   | <b>40</b>    | <b>10</b> | <b>50</b> |

**COURSE OUTCOMES**

|      |                                                                                                                                                                                                                                                      |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO 1 | Understand principle of counting, permutations, combinations, basic terminology.                                                                                                                                                                     |
| CO 2 | Understand the meaning of probability, probability and set notations, random experiment, sample space, event, axioms, notations, addition law of probability, theorem of total probability, independent events and multiplication law of probability |
| CO 3 | Understand LPP, canonical and standard form, Graphical solution method, Simplex method and computational procedure.                                                                                                                                  |
| CO 4 | Understand Network routing problems: introduction, network flow problem, minimal spanning tree problem and shortest route problems.                                                                                                                  |
| CO 5 | Understand Numerical Integration, Trapezoidal Rule and Simpson's 1/3-Rule.                                                                                                                                                                           |
| CO 6 | Understand Numerical methods to find Solutions of Ordinary Differential Equations: Solution by Euler's method and Runge-Kutta methods.                                                                                                               |
| CO 7 | Understand volumes of solid using cross sections and areas of surfaces of revolution                                                                                                                                                                 |

## 4C04 AMT-BCA: Mathematics for BCA IV

### Unit I- Probability (18 hours)

**Text: Higher Engineering Mathematics (41<sup>st</sup> edition), B.S. Grewal, Khanna Pub.**

Probability – introduction, principle of counting, permutations, combinations, basic terminology, definition of probability, statistical definition of probability, probability and set notations, random experiment, sample space, event, axioms, notations, addition law of probability or theorem of total probability (proof excluded), independent events, multiplication law of probability.

(Sections 26.1, 26.2, 26.3, 26.4, 26.5)

### Unit II- Linear Programming (24 hours)

**Text: Operations Research (18<sup>th</sup> thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.**

Mathematical formulation of daily life situations – simple cases only (*Questions should be avoided for end semester examination from this section*).

Canonical and standard form, Graphical solution method, Simplex method – computational procedure (Proof of theorems excluded)

(Sections 2.1, 2.2, 2.3, 2.4, 3.2, 4.3)

### Unit III - Linear programming (14 hours)

**Text: Operations Research (18<sup>th</sup> thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.**

Network routing problems – introduction, network flow problem, minimal spanning tree problem, shortest route problems (algorithm omitted)

(Sections 24.1, 24.2, 24.3, 24.4)

### Unit IV - Numerical Analysis (16 hours)

**Text: Introductory Methods of Numerical Analysis (fifth edition), S.S. Sastri PHI Learning, 2015**

Numerical Integration: Trapezoidal Rule, Simpson's 1/3- Rule

(Sections 6.4, 6.4.1, 6.4.2)

Numerical Solutions of Ordinary Differential Equations: Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods. (Sections 8.1, 8.2, 8.4, 8.4.2, 8.5)

## References

1. Introduction to Probability and Statistics, S. Lipschutz, J. Schiller, Schaum's Outline series
2. Linear Programming, G. Hadley, Oxford & IBH Publishing Company, New Delhi.
3. Operations Research, S. Kalavathy, Vikas Pub.
4. Mathematical methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub
5. Advanced Engineering Mathematics (10<sup>th</sup> edition), E. Kreyszig, Wiley

## Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 16                                | <b>40</b>     |
| II    | 20                                |               |
| III   | 14                                |               |
| IV    | 16                                |               |
| Total | <b>66</b>                         |               |

## Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)  
• *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)  
• *Answer any 7 questions* (7 questions x Marks 2 each = 14)
- Part C - Essay** (7 questions x Marks 3 each = 21)  
• *Answer any 4 questions* (4 questions x Marks 3 each = 12)
- Part D - Long Essay** (4 questions x Marks 5 each = 20)  
• *Answer any 2 questions* (2 questions x Marks 5 each = 10).

## PART C

### MATHEMATICS GENERIC ELECTIVE COURSES

#### WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

Any *one* Generic Elective Course from the following five courses can be chosen.

| COURSE CODE | COURSE TITLE                          | SEMESTER | HOURS PER WEEK | CREDIT | EXAM HOURS |
|-------------|---------------------------------------|----------|----------------|--------|------------|
| 5D01 MAT    | HISTORY OF MATHEMATICS                | V        | 2              | 2      | 2          |
| 5D02 MAT    | QUANTITATIVE ARITHMETIC AND REASONING | V        | 2              | 2      | 2          |
| 5D03 MAT    | LINEAR PROGRAMMING                    | V        | 2              | 2      | 2          |
| 5D04 MAT    | GRAPH THEORY                          | V        | 2              | 2      | 2          |
| 5D05 MAT    | BUSINESS MATHEMETICS                  | V        | 2              | 2      | 2          |

#### EVALUATION

| ASSESSMENT | WEIGHTAGE |
|------------|-----------|
| EXTERNAL   | 4         |
| INTERNAL   | 1         |

#### INTERNAL ASSESSMENT

| COMPONENT                                             | WEIGHTAGE | MARKS | REMARKS                                                                                                                                        |
|-------------------------------------------------------|-----------|-------|------------------------------------------------------------------------------------------------------------------------------------------------|
| COMPONENT1-<br>ASSIGNMENT /<br>SEMINAR /<br>VIVA-VOCE | 50%       | 2.5   | For each course, a student has to submit one assignment/<br>attend one seminar/<br>attend one viva-voce                                        |
| COMPONENT 2-<br>TEST PAPER                            | 50%       | 2.5   | For each course, a student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark. |
| TOTAL                                                 | 100%      | 5     |                                                                                                                                                |

## GENERIC ELECTIVE COURSE 1: HISTORY OF MATHEMATICS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| V        | 5D01 MAT    | 2              | 2      | 2          | 20           | 5        | 25    |

### COURSE OUTCOMES

|     |                                                                                                                                                                                             |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand the history of Early Number Systems and Symbols.                                                                                                                                 |
| CO2 | Understand the history of Mathematics in Early Civilizations.                                                                                                                               |
| CO3 | Understand the history of the Beginnings of Greek Mathematics                                                                                                                               |
| CO4 | Understand the Euclidean Geometry, Euclid's Foundation for Geometry, Euclid's Proof of the Pythagorean Theorem                                                                              |
| CO5 | Understand Infinity of Primes, Measurement of the Earth, Archimedes, The Ancient World's Genius, contributions of Hardy and Ramanujan, Examination, The Rejuvenation of English Mathematics |

### 5D01 MAT: History of mathematics

**Unit I** **(18 hours)**

Early Number Systems and Symbols, Mathematics in Early Civilizations  
(section 1.2, 1.3, 2.1 to 2.5)

**Unit II** **(18 hours)**

The Beginnings of Greek Mathematics, The Alexandrian School:Euclid, Hardy and Ramanujan, The Tripos Examination, The Rejuvenation of English Mathematics, A Unique Collaboration: Hardy and Littlewood, India's Prodigy, Ramanujan (section 3.1, 3.2, 4.1 to 4.5, 13.1)

**Text**

David M Burton, The History of Mathematics – An Introduction, Seventh Edition, Mc Graw Hill.

## References

1. Luke Hodgkin, A History of Mathematics from Mesopotamia to modernity, Oxford University Press.
2. Katz, Victor J., A History of Mathematics: An Introduction (3<sup>rd</sup> edition), Addison-Wesley
3. Berlinghoff, William P., and Fernando Q. Gouvêa, Math Through the Ages: A Gentle History for Teachers and Others, Expanded Edition, Oxtan House and MAA

## Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 17                                | 20            |
| II    | 16                                |               |
| Total | 33                                |               |

## Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 6 questions* (6 questions x Marks 2 each = 12)
- Part C - Essay** (2 questions x Marks 4 each = 8)
- *Answer any 1 question* (1 question x Marks 4 each = 4)

**GENERIC ELECTIVE COURSE 2:**  
**QUANTITATIVE ARITHMETIC AND REASONING**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| V        | 5D02 MAT    | 2              | 2      | 2          | 20           | 5        | 25    |

**COURSE OUTCOMES**

|     |                                                                           |
|-----|---------------------------------------------------------------------------|
| CO1 | Understand average, Problems on ages, Profit and loss and solves problems |
| CO2 | Understand Profit and loss, Ratio and proportion, Chain rule              |
| CO3 | Comprehend Time and work, Time and distance and solves problems           |
| CO4 | Comprehend Problems on trains, Boats and streams, Calendar, Clocks        |

**5D02 MAT: Quantitative Arithmetic and Reasoning**

**Unit I** **(18 hours)**

Average, Problems on ages, Profit and loss, Ratio and proportion, Chain rule (Chapters 6, 8, 11, 12, 14 of the Text).

**Unit II** **(18 hours)**

Time and work, Time and distance, Problems on trains, Boats and streams, Calendar, Clocks (Chapters 15, 17, 18, 19, 27, 28 of the Text).

**Text**

R.S. Aggarwal, Quantitative Aptitude for Competitive Examinations, S. Chand.



### Marks including choice

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 17                                | 20            |
| II    | 16                                |               |
| Total | 33                                |               |

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 6 questions* (6 questions x Marks 2 each = 12)
- Part C - Essay** (2 questions x Marks 4 each = 8)
- *Answer any 1 question* (1 question x Marks 4 each = 4)

- Use of Calculators shall not be permitted for this course.

## GENERIC ELECTIVE COURSE 3: LINEAR PROGRAMMING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| V        | 5D03 MAT    | 2              | 2      | 2          | 20           | 5        | 25    |

### COURSE OUTCOMES

|     |                                                                                                                                                  |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand General linear programming problem – canonical and standard forms of L.P.P, Solutions and fundamental properties of solutions of LPP. |
| CO2 | Understand Graphical solution method, Simplex method, Duality in linear programming, Formulating a dual problem.                                 |
| CO3 | Understand General transportation problem, the transportation tables, Loops in transportation table and solves transportation problem            |
| CO4 | Understand Degeneracy in transportation problem, Transportation algorithm (MODI method) and solves problems                                      |

### 5D03 MAT: Linear Programming

#### **Unit I - Linear programming (20 hours)**

Formulation of LPP from daily life situations (simple cases only and there should not be any question from this topic in the End Semester Examination). General linear programming problem – canonical and standard forms of L.P.P, Graphical solution method, Simplex method. (Sections 2.1, 2.2, relevant topics from 2.3 and 2.4, 3.2, 3.4, 3.5, 4.1, 4.3 of the Text. Proofs of all theorems are omitted).

#### **Unit II - Transportation problems (16 hours)**

General transportation problem, the transportation tables, Loops in transportation table, Solution of a transportation problem, Finding an initial basic feasible solution, Degeneracy in transportation problem, Transportation algorithm (MODI method). (Sections 10.1, 10.2, 10.5, 10.6, 10.9, 10.12, 10.13 of the Text. Proofs of all theorems are omitted)

**Text**

K. Swarup, P.K. Gupta and M. Mohan, Operations Research (18<sup>th</sup> edition), Sulthan Chand and Sons.

**References**

1. J. K. Sharma, Operations Research Theory and Applications. McMillan
2. G. Hadley, Linear Programming, Oxford & IBH Publishing Company
3. H. A. Thaha, Operations Research, An Introduction (8<sup>th</sup> edition), Prentice Hall

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 17                                | <b>20</b>     |
| II    | 16                                |               |
| Total | <b>33</b>                         |               |

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 6 questions* (6 questions x Marks 2 each=12)
- Part C - Essay** (2 questions x Marks 4 each = 8)
- *Answer any 1 question* ( 1question x Marks 4 each=4).
- **Use of Scientific Calculators below 100 functions ( that is, upto fx 99) shall be permitted for this courses.**

**GENERIC ELECTIVE COURSE 4:**  
**GRAPH THEORY**

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| V        | 5D04 MAT    | 2              | 2      | 2          | 20           | 5        | 25    |

**COURSE OUTCOMES**

|     |                                                                                                                                          |
|-----|------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand how to transform daily life problems into Graph Theoretical (Mathematical) Models                                             |
| CO2 | Understand the evolution of Graph Theory as a subject                                                                                    |
| CO3 | Understand the representation of Chinese Postman Problem, Marriage Problem, Travelling Salesman Problem and Personnel Assignment Problem |
| CO4 | Understand the concepts of planar graphs and Jordan curve                                                                                |
| CO5 | Comprehend Problem of colouring maps and Graph Colouring                                                                                 |

**5D04 MAT: Graph Theory**

**Unit I**

**(18 hours)**

1. Representing a telephone network so as to identify vulnerability to accidental disruption
2. Representing a set of jobs and a set of people so as to assign jobs to qualified persons
3. Representing a salesman's destinations in such a way that a shortest round trip through all destinations can be found out
4. Representing supply lines of electricity, gas and water so that each house gets the supply and the lines do not cross

5. Representing radio frequencies to assign frequencies to radio or TV broadcasting companies so that the frequencies do not interfere with each other
6. Representing the air route between cities so as to find out the cheapest route between cities
7. Konigsberg bridge problem
8. Checking whether it is possible to draw a closed figure without lifting pencil from the paper – Euler graph
9. Finding the shortest path for a postman to start from his Post Office, deliver the letters and return to the Post Office – Chinese Postman Problem.  
(*Relevant portions from sections 1.2, 3.1, 3.2*)

## **Unit II**

**(18 hours)**

10. Finding the path of minimum total distance for a travelling salesman involving a number of towns – Travelling Salesman Problem
11. Representing the problem of getting a set of boys married with a set of girls in such a way that a boy is married to his girlfriend – Marriage problem
12. Representing the problem of assigning qualified teachers to a set of classes – Personnel Assignment Problem
13. The problem whether we can join points inside a continuous non self intersecting curve whose origin and terminus coincide with a point exterior to it – Jordan curve theorem
14. The fact that there are only five regular polyhedra
15. The problem of colouring maps – Graph Colouring
16. Representing the streets of a city in such a way that one can drive from any part of the city to any other part  
(*Relevant portions from Sections 3.4, 4.2, 4.3, 5.1, 5.3, 6.1, 6.6, 7.4 of the Text*)

*(Necessary concepts may be introduced by the teacher to supplement the content. However, Theorems and their proofs are not included in the syllabus. The syllabus is meant only to give an idea of the applications of the subject Graph Theory in real life problems).*

## **Text**

A First Look at Graph Theory, John Clark and Derek Allan Holton, Allied Pub., 1995

## **References**

1. R. Balakrishnan and K. Ranganathan, A Text Book of Graph Theory (2<sup>nd</sup> edition), Springer.

2. J.A. Bondy and U.S.R. Murthy, Graph Theory with Applications, Macmillan
3. F. Harary, Graph Theory, Narosa
4. K.R. Parthasarathy, Basic Graph Theory, Tata-McGraw Hill.
5. G. Chartrand and P. Zhang, Introduction to Graph Theory, Tata McGraw Hill.

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 17                                | <b>25</b>     |
| II    | 16                                |               |
| Total | <b>33</b>                         |               |

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1each = 5)
- *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 6 questions* (6 questions x Marks 2 each=12)
- Part C - Essay** (2 questions x Marks 4 each = 8)
- *Answer any 1 question* ( 1question x Marks 4 each=4).

## GENERIC ELECTIVE COURSE 5: BUSINESS MATHEMATICS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS        |          |       |
|----------|-------------|----------------|--------|------------|--------------|----------|-------|
|          |             |                |        |            | END SEM EXAM | INTERNAL | TOTAL |
| V        | 5D05 MAT    | 2              | 2      | 2          | 20           | 5        | 25    |

### COURSE OUTCOMES

|     |                                                                                                                                                                                     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand the concept of Limit and continuity, methods of finding limits definition, Differentiation- rules of differentiation, Parametric function logarithmic differentiation.   |
| CO2 | Understand the Successive differentiation, Local maximum and local minimum and solves problems                                                                                      |
| CO3 | Understand the Rules of integration, Some standard results, Consumer's surplus, Producer's surplus, Consumer's surplus                                                              |
| CO4 | Understand rate of interest, Continuous compounding, Compound interest, Present value, interest and discount, Rate of discount, Equation of value, Depreciation and solves problems |

### 5D05 MAT: Business Mathematics

#### Unit I

**(18 hours)**

Functions, Limit and continuity: Constants and variables, functions, Limit of a function, methods of finding limits definition, Differentiation- rules of differentiation, Parametric function logarithmic differentiation, Successive differentiation, Local maximum and local minimum, (except concavity, convexity and points of inflexion), solved examples. (Sections 3.1 to 3.2, 3.6, 4.1, 4.3, 4.4, 4.7,4.8, 5.2,5.3)

#### Unit II

**(18 hours)**

Integral Calculus: Rules of integration, Some standard results, Consumer's surplus, Producer's surplus, Consumer's surplus under pure competition, Consumer's surplus under monopoly. Nominal rate of interest, Effective rate of interest, Continuous compounding, Compound interest, Present value, interest

and discount, Rate of discount, Equation of value, Depreciation. (Sections 6.1 to 6.2, 6.4, 7.2to 7.5, 8.1 to 8.9)

**Text**

B. M. Aggarwal, Business Mathematics and Statistics, Ane Books Pvt. Ltd.

**References**

1. A. C. Chiang and K. Wainwright, Fundamental Methods of Mathematical Economics
2. Knut Sydestar and Peter Hummond with Arne Storm, Essential Mathematics for Economic Analysis, Fourth Edition, Pearson

**Marks including choice**

| Unit  | Marks in End Semester Examination |               |
|-------|-----------------------------------|---------------|
|       | Aggregate Marks                   | Maximum Marks |
| I     | 17                                | <b>20</b>     |
| II    | 16                                |               |
| Total | <b>33</b>                         |               |

- Part A - Short answer** (5 questions x Mark 1each = 5)
- *Answer any 4 questions* (4 questions x Mark 1each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 6 questions* (6 questions x Marks 2 each=12)
- Part C - Essay** (2 questions x Marks 4 each = 8)
- *Answer any 1 question* ( 1question x Marks 4 each=4).
- **Use of Scientific Calculators below 100 functions ( that is, upto fx 99) shall be permitted for this course.**





KANNUR UNIVERSITY  
(Abstract)

B.Sc. Physics Programme-Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

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Academic Branch

No.Acad.C2/12291/2019

Dated, Civil Station P.O 21/ 06/ 2019

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- Read:-
1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
  2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
  3. U.O.No. Acad.C2/429/2017 Vol.II dated 03-06-2019
  4. The Minutes of the Meeting of the Board of Studies in Physics(UG) held on 06/06/2019
  5. Syllabus of B.Sc Physics Programme Submitted by the Chairperson, Board of Studies in Physics (UG) dated 12.06.2019

**ORDER**

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG Programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies and Workshops, discussion etc.

3. The Revised Regulation for UG Programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently ,as per paper read (4) above, the Board of Studies in Physics (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc. Physics Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Physics (UG) submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc. Physics Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper (Core/Complementary Elective/Generic Elective Course) of B.Sc. Physics Programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.Sc. Physics Programme are uploaded in the University website ([www.kannuruniversity.ac.in](http://www.kannuruniversity.ac.in))

Orders are issued accordingly.

Sd/-

DEPUTY REGISTRAR (ACADEMIC)  
For REGISTRAR

To


The Principals of Colleges offering B.Sc. Physics programme

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in B.Sc. Physics (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer (for uploading in the website)
6. SF/DF/FC



Forwarded/By Order

  
SECTION OFFICER



# **KANNUR UNIVERSITY**

**BOARD OF STUDIES -PHYSICS (UG)**

**SYLLABUS FOR PHYSICS CORE,  
COMPLEMENTARY ELECTIVE  
& GENERIC ELECTIVE COURSES  
OF BSc PROGRAMME**

**CHOICE BASED CREDIT AND SEMESTER SYSTEM  
(OBE – Outcome Based Education – system)**

**(2019 ADMISSION ONWARDS-)**

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**KANNUR UNIVERSITY**  
**VISION AND MISSION STATEMENTS**

**Vision:** To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

**Mission:**

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

**KANNUR UNIVERSITY**  
**PROGRAMME OUTCOMES (PO)**

**PO 1.Critical Thinking:**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and the ability to view positions, problems and social issues from plural perspectives.

**PO 2.Effective Citizenship:**

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

**PO 3.Effective Communication:**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

**PO 4.Interdisciplinarity:**

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

## **PREFACE**

The Board of Studies in Physics (UG) strives to offer students with a solid scientific and technical foundation and to promote them to build up vision in tackling problems and seeking solutions through the reformed outcome based curriculum and syllabus. This curriculum and syllabus clearly states the graduate attributes/outcomes and is developed after numerous workshops and discussions with different stakeholders.

The B.Sc. Physics degree course will open up exciting higher studies/employment opportunities for students. The course offers essential knowledge in theoretical Physics as well as practical knowledge to the students to apply it in real-life state of affairs. B.Sc. Physics aspirant needs to have basic knowledge in mathematical tools and techniques to pursue various courses in this programme.

The teachers should place much greater emphasis on supporting curricular activities aimed for achieving the desired attributes and programme outcomes, even if these are not part of the end semester examinations. Rote learning should be discouraged. The act of seeking new information and creation of new knowledge should be encouraged.

Appropriate three-day induction programmes/bridge courses can be offered to the first year B.Sc. Physics students to cope with the UG programme in Physics. The concerned Department/Institution has a flexibility to frame/adopt the bridge courses by adjusting the teaching hours accordingly.

The Board of Studies in Physics (UG) considered the introduction of outcome based curriculum and syllabus in affiliated colleges for the UG programme in Physics and resolved to implement the same from 2019 admission onwards.

Sheela M Joseph  
Chairperson  
Board of Studies, Physics (UG)  
Kannur University

**Kannur University**  
**Programme Specific Outcome of BSc Physics Programme**

**PSO1:** Understand and apply the principles of Classical mechanics, Quantum mechanics, Thermodynamics, Nuclear physics and Electrodynamics

**PSO 2:** Understand and apply the principles of Solid state physics, Optics, Photonics and Spectroscopy

**PSO 3:** Understand the principles of Electronics, Design and test electronic circuits

**PSO 4:** Understand and apply the principles of Mathematical Physics and Computational Physics and do Error analysis in measurements

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## KANNUR UNIVERSITY BSc PHYSICS PROGRAMME

### WORK AND CREDIT DISTRIBUTION STATEMENT

(BSc:Common English: 22, Additional Common: 16, Core: 56,

First complementary Elective: 12,Second complementary Elective:12, Generic Elective: 2)

| Semester                                    | Course Title*                                 | Credits | Hours per week | Total Credits | Total Hours |
|---------------------------------------------|-----------------------------------------------|---------|----------------|---------------|-------------|
| I                                           | Common Course(English)I                       | 4       | 5              | 18            | 25          |
|                                             | Common Course(English)II                      | 3       | 4              |               |             |
|                                             | Common Course (Addl Lang) VII                 | 4       | 4              |               |             |
|                                             | Core Course(Theory 1B01PHY)                   | 2       | 2              |               |             |
|                                             | Core Course(Practical 4B05PHY*)               | -       | 2              |               |             |
|                                             | First Complementary Elective Theory Maths I   | 3       | 4              |               |             |
|                                             | Second Complementary Elective Theory I        | 2       | 2              |               |             |
| Second Complementary Elective Practical I * | -                                             | 2       |                |               |             |
| II                                          | Common Course(English)III                     | 4       | 5              | 18            | 25          |
|                                             | Common Course(English)IV                      | 3       | 4              |               |             |
|                                             | Common Course (Addl Lang) VIII                | 4       | 4              |               |             |
|                                             | Core Course(Theory 2B02PHY)                   | 2       | 2              |               |             |
|                                             | Core Course(Practical 4B05PHY*)               | -       | 2              |               |             |
|                                             | First Complementary Elective Theory Maths II  | 3       | 4              |               |             |
|                                             | Second Complementary Elective Theory II       | 2       | 2              |               |             |
| Second Complementary Elective Practical I * | -                                             | 2       |                |               |             |
| III                                         | Common Course(English)V                       | 4       | 5              | 16            | 25          |
|                                             | Common Course (Addl Lang) IX                  | 4       | 5              |               |             |
|                                             | Core Course(Theory 3B03PHY)                   | 3       | 3              |               |             |
|                                             | Core Course(Practical 4B05PHY*)               | -       | 2              |               |             |
|                                             | First Complementary Elective Theory Maths III | 3       | 5              |               |             |
|                                             | Second Complementary Elective Theory III      | 2       | 3              |               |             |
|                                             | Second Complementary Elective Practical I *   | -       | 2              |               |             |
| IV                                          | Common Course(English)VI                      | 4       | 5              | 24            | 25          |
|                                             | Common Course (Addl Lang) X                   | 4       | 5              |               |             |
|                                             | Core Course(Theory 4B04PHY)                   | 3       | 3              |               |             |
|                                             | Core Course(Practical 4B05PHY)                | 4       | 2              |               |             |
|                                             | First Complementary Elective Theory Maths IV  | 3       | 5              |               |             |
|                                             | Second Complementary Elective Theory IV       | 2       | 3              |               |             |
|                                             | Second Complementary Elective Practical I     | 4       | 2              |               |             |



|       |                                       |   |   |     |     |
|-------|---------------------------------------|---|---|-----|-----|
| V     | Generic Elective Course!!             | 2 | 2 | 17  | 25  |
|       | Core Course (Theory-5B06PHY)          | 4 | 4 |     |     |
|       | Core Course (Theory-5B07PHY)          | 4 | 4 |     |     |
|       | Core Course (Theory-5B08PHY)          | 4 | 4 |     |     |
|       | Core Course (Theory-5B09PHY)          | 3 | 3 |     |     |
|       | Core Course (Practical II-6B15PHY**)  | - | 4 |     |     |
|       | Core Course (Practical III 6B16PHY**) | - | 4 |     |     |
| VI    | Core Course (Theory-6B10PHY)          | 4 | 4 | 27  | 25  |
|       | Core Course (Theory-6B11PHY)          | 4 | 4 |     |     |
|       | Core Course (Theory-6B12PHY)          | 4 | 4 |     |     |
|       | Core Course (Theory-6B13PHY)          | 3 | 3 |     |     |
|       | Discipline Specific elective 6B14PHY) | 2 | 2 |     |     |
|       | Core Course (Practical II-6B15PHY)    | 4 | 4 |     |     |
|       | Core Course (Practical III 6B16PHY)   | 4 | 4 |     |     |
|       | Project&Study Tour*** 6B17PHY         | 2 | - |     |     |
| Total |                                       |   |   | 120 | 150 |

\* External examination will be conducted at the end of Fourth Semester

\*\* External examination will be conducted at the end of Sixth Semester

\*\*\* Study tour report (Industrial visit/ Scientific Institution visit) should be submitted along with the project report

!!Generic elective courses offered by Physics is shown in PART C

First Complementary Elective (Compulsory):          Mathematics

Second Complementary Elective:    Chemistry/ Electronics/ Computer Science

**PART A:  
PHYSICS CORE COURSES  
WORK AND CREDIT DISTRIBUTION**

**(2019 ADMISSION ONWARDS)**

| Course code | Course title                             | Sem | Hours per week | Credit | Exam hours | Marks |     |       |
|-------------|------------------------------------------|-----|----------------|--------|------------|-------|-----|-------|
|             |                                          |     |                |        |            | CE    | ESE | Total |
| 1B01PHY     | MECHANICS I                              | I   | 2              | 2      | 3          | 10    | 40  | 50    |
| 2B02PHY     | MATHEMATICAL PHYSICS AND ERROR ANALYSIS  | II  | 2              | 2      | 3          | 10    | 40  | 50    |
| 3B03PHY     | MECHANICS II                             | III | 3              | 3      | 3          | 10    | 40  | 50    |
| 4B04PHY     | ELECTRONICS I                            | IV  | 3              | 3      | 3          | 10    | 40  | 50    |
| 4B05PHY     | GENERAL PHYSICS PRACTICAL I*             | IV  | 2              | 4      | 3          | 10    | 40  | 50    |
| 5B06PHY     | QUANTUM MECHANICS                        | V   | 4              | 4      | 3          | 10    | 40  | 50    |
| 5B07PHY     | ELECTROSTATICS AND MAGNETOSTATICS        | V   | 4              | 4      | 3          | 10    | 40  | 50    |
| 5B08PHY     | THERMODYNAMICS AND STATISTICAL MECHANICS | V   | 4              | 4      | 3          | 10    | 40  | 50    |
| 5B09PHY     | ELECTRONICS II                           | V   | 3              | 3      | 3          | 10    | 40  | 50    |
| 6B10PHY     | SOLID STATE PHYSICS AND SPECTROSCOPY     | VI  | 4              | 4      | 3          | 10    | 40  | 50    |
| 6B11PHY     | OPTICS AND PHOTONICS                     | VI  | 4              | 4      | 3          | 10    | 40  | 50    |
| 6B12PHY     | NUCLEAR, PARTICLE & ASTROPHYSICS         | VI  | 4              | 4      | 3          | 10    | 40  | 50    |
| 6B13PHY     | ELECTRODYNAMICS AND CIRCUIT THEORY       | VI  | 3              | 3      | 3          | 10    | 40  | 50    |
| 6B14PHY     | DISCIPLINE SPECIFIC ELECTIVE !           | VI  | 2              | 2      | 3          | 10    | 40  | 50    |
| 6B15PHY     | GENERAL PHYSICS PRACTICAL II**           | VI  | 4              | 4      | 3          | 10    | 40  | 50    |
| 6B16PHY     | ELECTRONICS PRACTICAL III**              | VI  | 4              | 4      | 3          | 10    | 40  | 50    |
| 6B17PHY     | PROJECT*** & STUDY TOUR                  | VI  | -              | 2      | -          | 5     | 20  | 25    |

\*External examination will be conducted at the end of Fourth Semester

\*\* External examination will be conducted at the end of Sixth Semester

\*\*\*External examination will be conducted at the end of Sixth Semester.

Study tour report (Industrial visit/ Scientific Institution visit) should be submitted along with the project report.

!Options available are listed in table I

**Table I**

| <b>COURSE CODE</b> | <b>COURSE TITLE</b>       |
|--------------------|---------------------------|
| <b>6B14 PHY(1)</b> | <b>PYTHON PROGRAMMING</b> |
| <b>6B14 PHY(2)</b> | <b>NANOSCIENCE</b>        |
| <b>6B14 PHY(3)</b> | <b>MATERIAL SCIENCE</b>   |
| <b>6B14 PHY(4)</b> | <b>COSMOLOGY</b>          |
| <b>6B14 PHY(5)</b> | <b>PLASMA PHYSICS</b>     |

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> |
|-------------------|------------------|
| EXTERNAL          | 80%              |
| INTERNAL          | 20%              |

**CONTINUOUS INTERNAL ASSESSMENT-THEORY**

| <b>COMPONENT</b>                                      | <b>WEIGHTAGE</b> | <b>REMARKS</b> |
|-------------------------------------------------------|------------------|----------------|
| COMPONENT 1<br>Test paper                             | 60%              | Best of two    |
| COMPONENT 2<br>Open book problem solving/Seminar/Viva | 40%              | One            |

**CONTINUOUS INTERNAL ASSESSMENT- PRACTICAL**

| <b>COMPONENT*</b>          | <b>WEIGHTAGE**</b> | <b>REMARKS</b>                                                                                                                  |
|----------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------|
| COMPONENT 1<br>Lab Skill   | 25%                |                                                                                                                                 |
| COMPONENT 2<br>Punctuality | 25%                |                                                                                                                                 |
| COMPONENT 3<br>Record      | 25%                | A logbook of practicals should be maintained which must include theory, observation, tabulation, calculation, graph, result etc |
| COMPONENT 4<br>Examination | 25%                | A model exam should be conducted before external examination & considered for internals                                         |

### CONTINUOUS INTERNAL ASSESSMENT- PROJECT

| <b>COMPONENT*</b>                | <b>WEIGHTAGE**</b> | <b>REMARKS</b>                                 |
|----------------------------------|--------------------|------------------------------------------------|
| COMPONENT 1<br>Topic             | 20%                | Relevance of topic                             |
| COMPONENT 2<br>Punctuality       | 20%                |                                                |
| COMPONENT 3<br>Scheme & report   | 20%                |                                                |
| COMPONENT 4<br>Viva-voce         | 20%                |                                                |
| COMPONENT 5<br>Study tour report | 20%                | Industrial visit/ Scientific Institution visit |

## CORE COURSE I: MECHANICS I

| SEMESTER | COURSE CODE    | HOURS PER WEEK | CREDIT   | EXAM HRS |
|----------|----------------|----------------|----------|----------|
| <b>I</b> | <b>1B01PHY</b> | <b>2</b>       | <b>2</b> | <b>3</b> |

### COURSE OUTCOME

- CO 1: Understand Newton's laws of motion, the concepts of linear and angular momentum and torque**
- CO2: Determine the Centre mass of a given configuration**
- CO3: Understand the principle of work, energy and power**
- CO4: Determine angular momentum of a body about any given axis**

### **Unit I – Newton's Laws-The foundations of Classical Mechanics** **12Hrs**

Newton's First Law, Second Law and Third Law – Astronauts in space-Standards and units – Some applications of Newton's laws-Astronauts tug of war-freight train-constraints-block on string – The everyday forces of physics-turtle in an elevator-block and string-dangling rope-block and wedge with friction-spring and block-spring gun-Illustration of initial conditions – Dynamics of a system of particles – The Bola – Centre of mass – Drum major's baton – Centre of mass motion– Conservation of momentum – Spring Gun recoil

[Book of Study, sections 2.1 – 2.5, 3.1 – 3.3]

### **Unit II – Work and Energy** **10 Hrs**

Integrating the equation of motion in one dimension – Mass thrown upward in a uniform gravitational field; Solving the equation of simple harmonic motion – Work-energy theorem in one dimension – Vertical motion in an inverse square field – Integrating the equation of motion in several dimensions – Work-energy theorem –; Escape velocity – Applying the work-energy theorem – Work done by a uniform force; Work done by a central force; Potential energy – Potential energy of a uniform force field; Potential energy of an inverse square force – What potential energy tells us about force – Stability – Energy diagrams – Small oscillations in a bound system – Molecular vibrations – Nonconservative forces – General law of conservation of energy – Power -conservation laws & particle collisions[Book of Study, sections 4.1 – 4.14].

### **Unit III – Angular Momentum** **10Hrs**

Angular momentum of a particle – Angular momentum of a sliding block; – Torque – Central force motion and the law of equal areas – Torque on a sliding block; Torque due to gravity – Angular momentum and fixed axis rotation – Moments of inertia of some simple objects – The parallel axis theorem– Dynamics of pure rotation about an axis – Atwood's machine with a massive pulley – The simple pendulum – The physical pendulum – Motion involving both translation and rotation –Angular momentum of a rolling wheel – Drum rolling down a plane – Work-energy theorem for a rigid body –

Drum rolling down a plane : energy method – The vector nature of angular velocity and angular momentum – Rotation through finite angles – Rotation in the xy-plane – Vector nature of angular velocity – Conservation of angular momentum

[Book of Study, sections 6.1 – 6.7, 7.1 -7.2, 7.5]

**Book of Study:**

1. An Introduction to Mechanics, 1<sup>st</sup>Edn. – Special Edition 2009 .-Daniel Kleppner and Robert J. Kolenkow – McGraw-Hill

**Books for Reference :**

1. Berkeley Physics Course : Vol.1 : Mechanics, 2<sup>nd</sup>Edn. – Kittel *et al.* – McGraw-Hill
2. Fundamentals of Physics by Resnick and Halliday

**MARKS INCLUDING CHOICE**

| Unit | Marks |
|------|-------|
| I    | 22    |
| II   | 18    |
| III  | 20    |

**PATTERN OF QUESTIONS**

|                                                                                                                                              |                               |                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>           | <b>(6 questions x Mark 1 = 6)</b>       |
|                                                                                                                                              | <b>Answer all questions</b>   | <b>(6 questions x Mark 1 = 6)</b>       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>            | <b>(8 questions x Marks 2 each =16)</b> |
|                                                                                                                                              | <b>Answer any 6 questions</b> | <b>(6questions x Marks 2 each=12)</b>   |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>               | <b>(6 questions x Marks 3 each =18)</b> |
|                                                                                                                                              | <b>Answer any 4 questions</b> | <b>( 4 questions x Marks 3 each=12)</b> |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>             | <b>(4 questions x Marks 5 each =20)</b> |
|                                                                                                                                              | <b>Answer any 2 questions</b> | <b>( 2 questions x Marks 5 each=10)</b> |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -60</b></li> <li>• <b>Maximum marks of the course-40</b></li> </ul> |                               |                                         |

**CORE COURSE II: MATHEMATICAL PHYSICS AND ERROR ANALYSIS**

| SEMESTER  | COURSE CODE    | HOURS PER WEEK | CREDIT   | EXAM HRS |
|-----------|----------------|----------------|----------|----------|
| <b>II</b> | <b>2B02PHY</b> | <b>2</b>       | <b>2</b> | <b>3</b> |

**COURSE OUTCOME**

- CO 1: Understand vector operations and vector algebra**
- CO2: Determine derivative and integral of various functions**
- CO3: State fundamental theorems of calculus**
- CO4: Compare differential operators in various coordinate systems**
- CO5: Understand the basic concepts of modeling**
- CO6: Solve first order and second order ODEs**
- CO7: Estimate uncertainties in measured values**

**Unit I– Vector Calculus**

**10 Hrs**

**Vector Algebra:** Vector operations-Vector algebra: Component form–Triple products–Position, Displacement and Separation vectors

**Differential Calculus:** “Ordinary “derivatives–Gradient–The Del operator–Divergence–Curl–Product rules– Second derivatives

**Integral Calculus:** Line integral, surface integral and volume integral–Fundamental theorem of calculus–Fundamental theorem for Gradients–Fundamental theorem for divergences: Gauss’s Divergence Theorem (no proof needed)–Fundamental theorem for curls: Stoke’s theorem (no proof needed)—Divergence-less vector fields–Curl-less vector fields– Potentials.  
**[Book I sections 1.1, 1.2, 1.3, 1.6]**

**Unit II Curvilinear co-ordinates**

**5Hrs**

Spherical polar coordinates–Cylindrical coordinates–Their relationship to Cartesian coordinates–Expressing differential displacement vector, differential area vectors, differential volume element, gradient operator, divergence operator and curl operator in spherical polar and cylindrical coordinates.  
**[Book I section 1.4]**

**Unit III– Differential Equation**

**9Hrs**

Basic concepts-modeling-geometric meaning-direction field –Euler’s method-separable ODE-modeling-exact ODE-integrating factors –linear ODEs –Bernoulli equation-

Population dynamics

Homogenous linear ODEs of second order-homogenous linear ODEs with constant coefficients-modeling of free oscillations of mass spring system

[BookII sections 1.1-1.5,2.1-2.2,2.4 ]

**Unit IV– Error Analysis**

**8 Hrs.**

Propagation of Uncertainties-uncertainties in direct measurement- Square root rule for counting experiments, Sums and differences, products and quotients, special cases – measured quantity times exact number, power, arbitrary function of one variable, Example-simple pendulum, General formula for error propagation.-Random and systematic errors, mean and standard deviation, standard deviation as uncertainty, standard deviation of the mean, examples, systematic errors

[Book III sections 3.1-3.4, 3.8, 3.9, 3.11, 4.1- 4.6]

**Book of Study :**

1. Electrodynamics – DavidGriffiths
2. AdvancedEngineering Mathematics, 10th Edn.– ErwinKreyszig– John Wiley&sons
3. AnIntroduction to Error Analysis, J R Taylor, (University Science Books).

**Books for Reference :**

1. AfirstcourseinDifferenialequationswithapplications–A.H.Siddiqui,P.Manchanda– Macmillan IndiaLtd
2. Mathematical Methods for PhysicsandEngineering, 3rdEdn.–K. F.Riley, M. P.Hobson, S. J.Bence

**MARKS INCLUDING CHOICE**

| Unit | Marks |
|------|-------|
| I    | 18    |
| II   | 12    |
| III  | 18    |
| IV   | 12    |



## PATTERN OF QUESTIONS

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                              | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                              | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                              | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -60</b></li> <li>• <b>Maximum marks of the course-40</b></li> </ul> |                        |                                  |

## CORE COURSE III: MECHANICS II

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| III      | 3B03PHY     | 3                 | 3      | 3           |

### COURSE OUTCOME

**CO1: Understand the concept of Galilean transformations and uniformly accelerating systems**

**CO2: Determine the trajectory of a body in central force problem using Newton's laws**

**CO3: Understand Kepler's laws of planetary motion**

**CO4: Formulate the mathematical equation of waves**

**CO5: Understand the concept and consequences of special theory of relativity**

#### **Unit I – Noninertial Systems and Fictitious Forces** **7Hrs**

Galilean transformations – Uniformly accelerating systems – The apparent force of gravity – Pendulum in an accelerating car – The principle of equivalence – Physics in a rotating coordinate system – Time derivatives and rotating coordinates – Acceleration relative to rotating coordinates – The apparent force in a rotating coordinate system – The Coriolis force – Deflection of a falling mass – Motion on the rotating earth

**[Book1 sections 8.1 – 8.5]**

#### **Unit II – Central Force Motion** **9 Hrs**

Central force motion as a one-body problem – General properties of central force motion – Motion is confined to a plane – Energy and angular momentum are constants of the motion – The law of equal areas – Finding the motion in real problems – The energy equation and energy diagrams – Noninteracting particles – Planetary motion – Hyperbolic orbits – Satellite orbit – Kepler's laws – The law of periods – Properties of the ellipse

**[Book1 sections 9.1 – 9.7]**

#### **Unit III – Harmonic Oscillator** **8 Hrs**

Introduction and review – Standard form of the solution – Nomenclature – Initial conditions and the frictionless harmonic oscillator – Energy considerations – Time average values – Average energy – Damped harmonic oscillator – Energy and Q-factor – Graphical analysis of a damped oscillator – Solution of the equation of motion for

the damped oscillator – Forced harmonic oscillator – Undamped forced oscillator – Resonance  
[Book 1 sections 10.1 – 10.3]

**Unit IV-Waves**

**6Hrs**

Waves-Progressive wave-General equation of wave motion- plane progressive harmonic wave-Energy density-Transverse waves in stretched strings-longitudinal waves in rods longitudinal waves in gases-Fouriers theorem-mathematical expression-conditions  
(Book 2 11.1-11.9,11.12)

**Unit V–Special Theory of Relativity**

**18 Hrs**

Classical relativity-,Michelson –Morley experiment,Einstein’s postulates-consequences of Einstein’s postulates-relativity of time-relativity of length-relativistic velocity addition-relativistic Doppler effect, Lorentz transformation-length contraction-velocity transformation-simultaneity and clock synchronization-twin paradox-space time diagram-relativistic dynamics-relativistic kinetic energy-relativistic total energy and kinetic energy–conservation laws in relativistic decay and collision,experimental tests of special relativity-universality of speed of light-time dialation- Doppler effect-relativistic momentum and energy-twin paradox

(Book 3 Sections 2.1-2.9)

**Books of Study :**

1. An Introduction to Mechanics, 1<sup>st</sup>Edn. – Daniel Kleppner and Robert J. Kolenkow – McGraw- Hill
2. Mechanics by J C Upadhyaya 5<sup>th</sup>edn.
3. Modern Physics by Kenneth S Krane, 2<sup>nd</sup>edn.

**Books for Reference:**

1. Berkeley Physics Course : Vol.1 : Mechanics, 2<sup>nd</sup>Edn. – Kittle *et al.* – McGraw-Hill

**MARKS INCLUDING CHOICE**

| Unit | Marks |
|------|-------|
| I    | 8     |
| II   | 10    |
| III  | 10    |
| IV   | 8     |
| V    | 24    |

## PATTERN OF QUESTIONS

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                              | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                              | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                              | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -60</b></li> <li>• <b>Maximum marks of the course-40</b></li> </ul> |                        |                                  |

## CORE COURSE IV: ELECTRONICS I

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| IV       | 4B04PHY     | 3                 | 3      | 3           |

### COURSE OUTCOME

**CO 1: Understand the basics of PN junction diode, Zener diode and their applications**

**CO2: Understand the structure, operations and characteristics of BJT and FET**

**CO3 :Understand the biasing methods and design of BJT and FET circuits**

**CO4: Understand the different number systems, conversions and binary arithmetic operations**

**CO5 : Understand the basic combinational logic gates**

**CO6 : Understand the Boolean algebra &logic simplification using Boolean algebra**

**Unit I : Semiconductor Diodes and their Applications** **8 Hrs.**

PN junction diode, Characteristics and parameters, Diode approximations, DC load line analysis, Zener diodes, Half wave rectification, Full wave rectification, Half wave rectifier power supply, Full wave rectifier power supply, Zener diode voltage regulators.  
**(Book 1, Sections 2.1-2.4, 2.9, 3.1-3.4, 3.7)**

**Unit II: Bipolar Junction Transistors and their Biasing** **12 Hrs.**

BJT Operation, BJT Voltages and Currents, BJT amplification, Common Base Characteristics, Common Emitter Characteristics, Common Collector Characteristics, DC Load line and Bias point, Base bias, Collector to base bias, Voltage divider bias, Comparison of basic bias circuits, Bias circuit design, Thermal stability of bias circuits, Switching circuits. **(Book 1, Sections 4.1-4.3, 4.5-4.7, 5.1-5.5, 5.7, 5.9, 5.10)**

**Unit III: Field Effect Transistors and their Biasing** **10 Hrs**

Junction field effect transistors, JFET characteristics, JFET Parameters, DC load line and bias point, Gate bias, Self bias and Voltage divider bias, Comparison of basic JFET bias circuits, MOSFET, Types of MOSFETs, D-MOSFET – Symbol, Circuit operation, Transfer Characteristics; E-MOSFET.

**. (Book 1, Sections 9.1-9.3, 10.1-10.5; Book 2, Sections 19.27-19.31, 19.36)**

**Unit IV: Number Systems, Operations and Codes** **8 Hrs.**

Binary numbers, Decimal to Binary Conversion, Binary Arithmetic, 1's and 2's Complements of Binary Numbers, Signed Numbers, Arithmetic Operations with Signed

Numbers, Hexadecimal Numbers, Octal Numbers, Binary Coded Decimals, Gray code, ASCII code.  
**(Book 3, Sections 2.2-2.11)**

**Unit V: Logic gates, Boolean Algebra and Logic Simplification** **10 Hrs**

The inverter, AND, OR, NAND, NOR, Exclusive- OR and Exclusive - NOR Gates, Boolean Operations and Expressions, Laws and rules of Boolean Algebra, DeMorgan's Theorems, Boolean Analysis of Logic circuits, Simplification using Boolean Algebra, Basic combinational Logic circuits, The universal property of NAND and NOR gates, Combinational logic using NAND and NOR gates.

**. (Book 3, Sections 3.1-3.6, 4.1-4.5, 5.1, 5.3, 5.4)**

**Books for Study:**

1. Electronic Devices and Circuits - 5th Edition, David A Bell (Oxford University Press)
2. Principles of Electronics - 11th Edition, V K Mehta & Rohit Mehta (S Chand & Co.)
3. Digital Fundamentals - 10th Edition, Thomas L. Floyd (Pearson Education)

**Books for Reference:**

1. Electronic Devices and circuit theory - Robert L Boylestad & Louis Nashelsky (Pearson Eduaction)
2. Electronic Principles - A P Malvino (TMH)
3. Electronic Devices and circuits -Theodore F Bogart, Jeffrey S. Beasley & Guillermo Rico (Pearson)
4. The Art of Electronics - Paul Horowitz and Winfield Hill (Cambridge University Press)
5. Digital Principles and Applications - D P Leach and A P Malvino (TMH)
6. Fundamentals of Digital Ciruits - A Anandakumar (PHI)

**MARKS INCLUDING CHOICE:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| I           | 10           |
| II          | 16           |
| III         | 12           |
| IV          | 10           |
| V           | 12           |

## PATTERN OF QUESTIONS

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                           | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                             | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                           | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                             | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                           | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -60</b></li><li>• <b>Maximum marks of the course-40</b></li></ul> |                        |                                  |

**CORE COURSE V: - GENERAL PHYSICS PRACTICAL I**  
**BASIC EXPERIMENTS IN PROPERTIES OF MATTER, OPTICS,**  
**ELECTRICITY & MAGNETISM**

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| IV       | 4B05PHY     | 2                 | 4      | 3           |

**COURSE OUTCOME**

- CO1: Familiarize with apparatus for mechanical, electrical, magnetic and optical experiments.**
- CO2: Develop skill in setting up of apparatus for accurate measurement of physical quantities.**
- CO3: Understand multiple experimental techniques for determining physical quantities.**
- CO4: Develop skill in systematic way of measurements by minimizing possible errors.**
- CO5: Develop skill to analyze by plotting graphs using software.**
- CO6: Develop skill for systematic trouble shooting.**
- CO7: Perform error analysis for experiments.**

**Note:** A brief theoretical background of each experiment must be given to the students before each cycle of experiments and assess it. Students have to maintain a practical log book regularly signed by the teacher in charge and should be submitted at the time of University Examination. Fair record is not required. All the 20 experiments have to be performed.

1. Flywheel- Moment of inertia
2. Torsion pendulum- Moment of inertia of a disc and rigidity modulus (using two identical masses)



3. Compound pendulum- To find 'g' and radius of gyration
4. Young's modulus of the material of bar-Non-uniform bending using pin & microscope
5. Young's modulus of the material of bar -Uniform Bending using optic lever
6. Surface Tension by capillary rise method
7. Coefficient of viscosity –Poiseuille's formula (by measuring radius of capillary tube using mercury)
8. Rigidity modulus of a material-Static torsion
9. Spectrometer – Refractive index of the material of a prism
10. Spectrometer –Dispersive power of a prism
11. Melde's String- Frequency of a tuning fork
12. Lee's disc- Thermal conductivity of a bad conductor
13. Newton's law of cooling- Specific heat of a liquid
14. Potentiometer- - resistance & resistivity
15. Potentiometer- Calibration of low range voltmeter (null Method)
16. Carey Fosters Bridge- resistance & resistivity
17. Deflection Magnetometer- Tan A , Tan B and Tan C
18. Deflection Magnetometer & Box type vibration magnetometer- m and B<sub>0</sub>
19. Searle's Vibration magnetometer- moment and ratio of moments
20. Liquid Lens I –Refractive index of a liquid and material of the lens
  - (i) using mercury
  - (ii) using another liquid of known refractive index

### Reference Books

1. Practical Physics by P R Sasi Kumar PHI Learning Private Limited
2. BSc Practical Physics by C L Arora ,S Chand
3. An advanced course in Practical Physics by D.Chattopadhyay& P C Rakhit New Central Book Agency(P)Ltd

## MARKS DISTRIBUTION

| Sections                                                       | Marks |
|----------------------------------------------------------------|-------|
| I Principle with theory                                        | 10    |
| II Performance                                                 | 6     |
| III Observation                                                | 14    |
| IV Viva to evaluate the skill & knowledge about the experiment | 4     |
| V Calculation ,Graph etc                                       | 6     |

## CORE COURSE VI: QUANTUM MECHANICS

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5B06PHY     | 4                 | 4      | 3           |

### COURSE OUTCOME

- CO 1: Understand the limitations of classical mechanics**
- CO2: Explain Blackbody radiation problem, Photoelectric effect and Compton Effect using quantum theory of radiation**
- CO3: Understand Rutherford, Bohr atom models and concept of energy and angular momentum quantisation**
- CO4: Understand de-Broglie hypothesis, concept of wave nature of matter and Heisenberg uncertainty principle**
- CO5: Determine probability of finding a particle and expectation values of variable using its wave function**
- CO6: Write and solve Schrodinger equation for simple quantum mechanical systems**
- CO7: State and explain Pauli's exclusion principle**

**Unit I – Particle like Properties of Electromagnetic Radiation** **12 Hrs**  
Review of electromagnetic waves – Photoelectric effect – Blackbody radiation – Compton effect – Other photon processes – What is a photon ?  
**[Book 1 Sections 3.1 to 3.6]**

**Unit II – Rutherford-Bohr Model of the Atom** **10Hrs**  
Basic properties of atoms – Thomson model – Rutherford nuclear atom – Line spectra – Bohr model – Frank-Hertz experiment – Correspondence principle – Deficiencies of Bohr model  
**[Book 1 Sections 6.1 to 6.8]**

**Unit III – Wavelike Properties of Particles** **10 Hrs**  
De Broglie hypothesis – Uncertainty relationships for classical waves – Heisenberg uncertainty relationships – Wave packets – Probability and randomness – Probability amplitude  
**[Book 1 Sections 4.1 to 4.6]**

**Unit IV – The Schrodinger Equation** **14 Hrs**

Justification of the Schrodinger equation – The Schrodinger recipe – Probabilities and normalization – Applications – Free particle, Particle in a box (one dimension), Particle in a box (two dimensions), Simple harmonic oscillator – Time dependence – Potential energy steps and potential energy barriers **[Book 1 Sections 5.1 to 5.7]**

**Unit V– Hydrogen Atom in Wave Mechanics**

**12Hrs**

Schrodinger equation in spherical coordinates – Hydrogen atom wave functions – Radial probability densities – Angular momentum and probability densities – Intrinsic spin – Stern – Gerlach expt – Energy levels and spectroscopic notation – Zeeman effect – Fine structure **[Book 1 Sections 7.1 to 7.8]**

**Unit VI-Many electron atom**

**6hrs**

Electron spin, Pauli's Exclusion principle- many electron atom- Spin orbit coupling- total angular momentum- X-Ray spectra

**[Book 2 Sections 7.1,7.2,7.4,7.8,7.9,7.10 ]**

**Book of study :**

1. Modern Physics, 2<sup>nd</sup>Edn. – Kenneth S. Krane – John Wiley & sons
2. Concepts of Modern Physics ,6<sup>th</sup>Edn–Arthur Beiser

**Books of Reference:**

1. Modern Physics, 3<sup>rd</sup>Edn. – Raymond A. Serway, Clement J. Moses, Curt A. Moyer – Cengage
2. Modern Physics, 2<sup>nd</sup>Edn – Randy Harris – Pearson
3. Modern Physics for Scientists and Engineers, 2<sup>nd</sup>Edn. – John R. Taylor, Chris D. Zafiratos, Michael A. Dubson – Prentice-Hall of India Pvt. Ltd.

**MARKS INCLUDING CHOICE**

| Unit | Marks |
|------|-------|
| I    | 12    |
| II   | 10    |
| III  | 10    |
| IV   | 14    |
| V    | 10    |
| VI   | 4     |

### PATTERN OF QUESTIONS

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                              | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                              | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                              | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -60</b></li> <li>• <b>Maximum marks of the course-40</b></li> </ul> |                        |                                  |

## CORE COURSE VII: ELECTROSTATICS AND MAGNETOSTATICS

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5B07 PHY    | 4                 | 4      | 3           |

### COURSE OUTCOME

#### Course Outcomes

- CO1: Understand the concept of Electric field, electric potential, magnetic field and magnetic potentials
- CO2: Use the principle of superposition and law of Gauss to calculate electric field Intensity
- CO3: Determine Electric potential of charge distributions and hence specify electric field intensity
- CO4: Understand the basic properties of conductors and capacitors
- CO5: Calculate the magnetic fields due to currents using Biot-Savart and Ampere laws.
- CO6: Compare Magnetostatics and Electrostatics.
- CO7: Understand Diamagnets, Paramagnets and Ferro magnets.

#### **Unit I- Electric field and Electric potential.**

**16 hrs**

Coulomb's law for a group of point charges, Idea of electric field, Electric field for (i) a point charge, (ii) group of point charges, (iii) continuous charge distributions, Electric Field lines, Gauss's law - its differential form and proof using Dirac delta function, Applications of Gauss's Law: E due to (i) a Uniformly charged solid sphere, (ii) an Infinite plane of uniform charge density, and (iii) Two infinite parallel planes with equal & opposite charge densities. The curl of E. Electric potential V due to (i) a point charge, (ii) a group of point charges, (iii) charge distribution. Relation between E and V in differential and integral form, Poisson's equation and Laplace's equation, Potential inside and outside spherical shell, Electrostatic boundary conditions.

**( Book 1, Sections 2.1, 2.2, 1.5.1, 1.5.2, 1.5.3, 2.3 )**

#### **Unit II: Work and Energy in Electrostatics.**

**6hrs**

Work done to move a charge, The energy of a point charge distribution, The energy of a continuous charge distribution, Electrostatic energy of a (i) uniformly charged spherical shell and (ii) uniformly charged solid sphere, Comments on electrostatic energy, Capacitors: capacitance of a parallel plate capacitor, work done to charge up a capacitor.

**(Book 1, Sections 2.4, 2.5.4 )**

#### **Unit III: Electrostatic Fields in Matter.**

**14 hrs**

Induced charges, Faraday cage, Dielectrics: induced dipoles - Alignment of polar molecules, Polarization P, Bound charges, Physical interpretation of bound charges, The

field inside a dielectric. Electric displacement vector  $D$ , Gauss's law in the presence of a dielectric, A deceptive parallel between  $E$  and  $D$ , Boundary conditions, Electrical susceptibility, permittivity & dielectric constant, Relation between  $E, P$  and  $D$ . Forces on dielectrics  
**(Book 1, Sections 2.5.2, 4.1, 4.2, 4.3, 4.4.1, 4.4.4 )**

**Unit IV : Magnetostatics.**

**16hrs**

The Lorenz force law, Cyclotron motion, Cycloid motion, Magnetic force on (i) a Line current, (ii) Surface current & (iii) Volume current, Continuity equation, Steady currents, The Biot Savart law, Magnetic field due to (i) Infinitely long current carrying wire, (ii) circular loop carrying current, The Divergence & Curl of  $B$ , Ampere's law, Applications of Ampere's law: (i)  $B$  due to a long straight current carrying wire, (ii) Magnetic field of a very long solenoid. Comparison of magnetostatics & electrostatics, Magnetic vector potential, Magnetostatic boundary conditions, Multipole expansion of vector potential, magnetic dipole moment.

**(Book 1, Sections 5.1, 5.2, 5.3)**

**Unit V: Magnetic Fields in Matter:**

**12hrs**

Diamagnets, Paramagnets and Ferromagnets, Torques and forces on magnetic dipoles, Effect of a magnetic field on atomic orbits. Magnetization, The field of a magnetized object, Bound currents and its Physical interpretation. The magnetic field inside matter, The auxiliary field  $H$ , Ampere's law in Magnetized material, Deceptive parallel between  $B$  and  $H$ , Magnetostatic Boundary conditions. Linear and Nonlinear Media, magnetic susceptibility and permeability. Ferromagnetism

**(Book 1, Sections 6.1, 6.2, 6.3, 6.4 )**

**Book for Study:**

1. Introduction to electrodynamics -David .J .Griffiths ,3rd Edn,1999,Prentice Hall of India

**Books for Reference:**

1. Electricity and Magnetism, J.H.Fewkes & J.Yarwood. Vol.I, 1991, Oxford Univ. Press.
2. Feynman Lectures Vol.2, R.P.Feynman, R.B.Leighton, M.Sands, 2008, Pearson Education

**MARKS INCLUDING CHOICE**

| Unit | Marks |
|------|-------|
| I    | 16    |
| II   | 6     |
| III  | 14    |
| IV   | 14    |
| V    | 10    |

## PATTERN OF QUESTIONS

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                           | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                             | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                           | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                             | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                           | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -60</b></li><li>• <b>Maximum marks of the course-40</b></li></ul> |                        |                                  |



## CORE COURSE VIII: THERMODYNAMICS AND STATISTICAL MECHANICS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5 B08PHY    | 4              | 4      | 3        |

### COURSE OUTCOME

- CO 1: Understand the concept of temperature ,the thermodynamic state and equilibrium.**
- CO2: Explain the first law of thermodynamics through work and heat and its Mathematical Formulation.**
- CO3: Understand the ideal gas equation and kinetic theory of gases**
- CO4: Understand the second law of thermodynamics and thermodynamic temperature scale.**
- CO5: Define entropy and thermodynamic potentials**
- CO6: Understand the basic concepts of Statistical mechanics**

**Unit I: Temperature &Zeroth law of Thermodynamics** **8hrs**  
 Macroscopic and microscopic point of view- Macroscopic vs. microscopic point of view –scope of Thermodynamics-thermal equilibrium- zeroth law-concept of temperature-thermo meters & measurement of temperature- ideal gas temperature – Celsius temperature scale-Celsius & Fahrenheit temperature scale- thermodynamic equilibrium –equation of state-hydrostatic systems-mathematical theorems -intensive and extensive parameters  
**( Book 1 sections 1.1 – 1.7,1.10-1.11,1.17,2.1-2.4,2.10 )**

**Unit II: Work, heat and first law of thermodynamics** **14 hrs**  
 Work- Quasistatic process- work in changing volume of a hydrostatic system-PV diagram-hydrostatic work depends on path-calculation of  $\int p dv$  for Quasistatic process-generalized work-composite systems-work & heat-Adiabatic work-internal energy function-mathematical formulation of first law-concept of heat – concept of path and state function -differential form of first law-heat capacity & measurements – sp heat of water: the calorie-equations for a hydrostatic system- heat reservoir- conduction-convection-radiation- Kirchoff& Stefan-Boltzmann law.  
**(Book 1 sections 3.1-3.6,3.12-3.13,4.1-4.11,4.13-4.16 )**  
**8 hrs**

### **Unit III: Ideal gas**

Equation of state of a gas –internal energy of a real gas-ideal gas-quasistatic adiabatic process-kinetic theory of the ideal gas. **(Book 1 sections 5.1-5.3, 5.5, 5.9)**

### **Unit IV: The second law of thermodynamics, Carnot cycle & Thermodynamic temperature scale** **15 hrs**

Conversion of work into heat and vice-versa- principle of heat engines , cyclic process- gasoline engine and its efficiency, Diesel engine and its efficiency- heat engine kelvin Planck statement of second law-refrigerator ; clausius statement of second law – equivalence of both- reversibility & irreversibility –external-internal mechanical irreversibility- external-internal thermal irreversibility-chemical irreversibility- conditions for reversibility- Carnot cycle- Carnot Refrigerator- Carnot's theorem & corollary- the thermodynamic temperature scale-Absolute zero & Carnot efficiency-equality of ideal gas & thermodynamic temperatures.

**(Book 1 sections 6.1-6.3, 6.6-6.14, 7.1.7.3-7.7 )**

### **Unit V: Entropy & Thermodynamic potentials** **14 hrs**

Entropy , thermodynamic potentials & open systems Reversible part of second law- Entropy- entropy of an ideal gas - T-S diagram –entropy & reversibility - entropy & irreversibility- irreversible part of second law- heat & entropy in irreversible processes- entropy & non equilibrium states-principle of increase of entropy-entropy & disorder Thermodynamic potentials-Internal energy, Enthalpy- Helmholtz free energy, Gibbsfunction- Maxwells relations,-joule Thomson expansion-first order phase transition ;clausiusclapeyron equation- clausiusclapeyron equation& phase diagrams.

**(Book 1 sections 8.1-8.2, 8.4-8.11,8.13,12.1,12.3-12.4 )**

### **Unit VI: Statistical mechanics** **5hrs**

Statistical distribution-MB statistics-Molecular Energies in an ideal gas-quantum statistics- Specific heat of solids

**(Book 2Section 9.1-9.4 )**

### **Books for study:**

1. Heat and Thermodynamics-Mark W Zemansk,Richard H Dittman (8th Edn.)
2. .Modern Physics by Arthur Beiser

### **Books for Reference:**

1. Basic thermodynamics by E V Guha
2. Statistical Physics by F.Reif

## MARKS INCLUDING CHOICE

| Unit | Marks |
|------|-------|
| I    | 8     |
| II   | 12    |
| III  | 6     |
| IV   | 14    |
| V    | 14    |
| VI   | 6     |

## PATTERN OF QUESTIONS

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                              | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                              | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                              | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -60</b></li> <li>• <b>Maximum marks of the course-40</b></li> </ul> |                        |                                  |

## CORE COURSE IX: ELECTRONICS II

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5B09PHY     | 3                 | 3      | 3           |

### COURSE OUTCOME

**CO 1: Understand the AC analysis of BJT circuits and CE amplifiers**

**CO2: Understand the feedback circuits, oscillators and power amplifiers**

**CO3: Understand OPAMP basics and different OPAMP circuits**

**CO4: Understand the standard forms Boolean Expressions, Functions of Combinational Logic and K map simplifications.**

**Unit I: AC analysis of BJT circuits and Small signal amplifiers** **10 Hrs.**

Coupling and bypass capacitors, AC load lines, transistor models, r-parameters, h-parameters, CE circuit analysis, Decibels and half power points, BJT circuit Frequency response, Single stage CE amplifier, Capacitor coupled and Direct coupled two stage CE amplifiers, Emitter follower.

**(Book 1, Sections 6.1-6.4, 8.2, 8.4, 12.1, 12.3, 12.4; Book 2, Section 13.9)**

**Unit II: Feedback in amplifiers, Signal generators and Power amplifiers** **14 Hrs.**

Types of feedback, Series voltage negative feedback - advantages, Single stage emitter series current feedback circuit, Concept of positive feedback, Barkhausen criterion, Phase shift, Colpitts, Hartley, and Wien bridge Oscillators, Audio power amplifiers - Transformer coupled Class A, Class B and Class AB amplifiers, Class C tuned amplifier.

**(Book 1, Sections 13.1, 13.5, 16.1-16.4, 19.1, 19.2, 19.11)**

**Unit III: Operational Amplifiers and their Applications** **10 Hrs**

Integrated circuit operational amplifiers, Op-amp – Important Parameters, Output voltage, AC analysis, Bandwidth, Slew rate; Ideal Op-amp properties, Applications of Op-amps - Inverting amplifier, Non Inverting amplifier, Voltage follower, Summing amplifier, Difference amplifier, Integrator and Differentiator.

**(Book 1, Sections 14.1, 14.7; Book 2, Sections 25.17-25.20, 25.23-25.27, 25.32, 25.34, 25.35, 25.37)**

**Unit IV: Standard forms of Boolean Expressions** **8 Hrs.**

The SOP and POS forms, Conversion of a general expression to SOP and POS forms, Converting standard SOP to POS and vice versa, Boolean Expressions and Truth Tables, Karnaugh Map (up to 4 variables), Karnaugh Map SOP minimization.

**(Book 3, Sections 4.6-4.9)**

**Unit V: Functions of Combinational Logic** **6 Hrs.**

Basic Adders - Half Adder, Full Adder; Parallel Binary Adders - 4 Bit Parallel Adder, Comparators, Basic binary Decoder, 4-bit Decoder, Decimal to BCD Encoder.

**(Book 3, Sections 6.1, 6.2, 6.4-6.6)**

**Books for Study:**

1. Electronic Devices and Circuits - 5th Edition, David A Bell (Oxford University Press)
2. Principles of Electronics - 11th Edition, V K Mehta & Rohit Mehta (S Chand & Co.)
3. Digital Fundamentals - 8th Edition, Thomas L. Floyd (Pearson Education)

**Books for Reference:**

1. Electronic Devices and circuit theory - Robert L Boylestad & Louis Nashelsky (Pearson Education)
2. Op-Amps & Linear Integrated Circuits - Ramakant A. Gayakwad (Pearson Education)
3. Electronic Principles - A P Malvino (TMH)
4. The Art of Electronics - Paul Horowitz and Winfield Hill (Cambridge University Press)
5. Digital Principles and Applications - D P Leach and A P Malvino (TMH)
6. Fundamentals of Digital Circuits - A Anandakumar (PHI)

**MARKS INCLUDING CHOICE:**

| Unit | Marks |
|------|-------|
| I    | 14    |
| II   | 16    |
| III  | 12    |
| IV   | 12    |
| V    | 6     |

## PATTERN OF QUESTIONS

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                              | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                              | Answer any 6 questions | (6 questions x Marks 2 each=12)  |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                              | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -60</b></li> <li>• <b>Maximum marks of the course-40</b></li> </ul> |                        |                                  |

## CORE COURSE X: SOLID STATE PHYSICS & SPECTROSCOPY

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| VI       | 6B10PHY     | 4                 | 4      | 3           |

### COURSE OUTCOMES

- CO 1: Understand basic crystal structure and compare various crystal systems**  
**CO2: State and prove Bragg's law**  
**CO3: Explain X-ray diffraction and various methods to obtain diffraction pattern**  
**CO4: Understand basic properties of semiconductors and band structure of solids**  
**CO5: Discuss Hall Effect and list its applications**  
**CO6: Describe various regions of EM spectrum**  
**CO7: Distinguish between microwave and infrared spectroscopy**  
**CO8: Define Raman Effect and explain its quantum theory**

#### **Unit I Structural study of crystalline solids 15Hrs**

Introduction – Lattice points and space lattice – The basis and crystal structure – Unit cells and lattice parameters – Unit cell verses primitive cell – Crystal systems – Symmetry elements in crystals – Metallic crystal structures SC, BCC, FCC and HCP structures – Directions, planes and Miller indices – Important features of Miller indices  
(**Book 1 Chapter 4, Sections I-XVI, XVIII-XIX**)

#### **Unit II X-Ray diffraction 8hrs**

Bragg's law – Bragg's X Ray Spectrometer – Powder crystal method – Rotating Crystal method  
(**Book 1 Chapter 5, Sections VII-XI**)

#### **Unit III Semiconducting properties of materials 15hrs**

Semiconductors – Intrinsic and extrinsic semiconductors – Band structure of semiconductors – Fermi level of intrinsic and extrinsic semiconductors - Fermi level and carrier concentration in semiconductors – Mobility of charge carriers – Electrical conductivity in semiconductors – Hall effect – Applications of Hall effect  
(**Book 2: Chapter 13 .1-13.4,13.6, Book 1 section XIV**)

**Unit IV Spectroscopy****12hrs**

Regions of the spectrum-Microwave spectroscopy-The rotation of molecules-Rotational spectra-The rigid diatomic molecule-Intensities of spectral lines-The effect of isotopic substitution-The microwave oven

(Book 3 chapter 1 section 1.3, chapter 2 sections 2.1 - 2.2, 2.3.1 - 2.3.3 , 2.7)

**Unit V Infrared spectroscopy****12hrs**

The vibrating diatomic molecule-The energy of diatomic molecule-The Simple Harmonic Oscillator - The Anharmonic Oscillator-The diatomic Vibrating Rotator-The vibration-rotation spectrum of carbon monoxide

(Book 3 chapter 3 sections 3.1.1-3.1.3, 3.2-3.3)

**Unit V Raman Effect****2hrs**

Stokes and Antistokes lines-classical explanation-Quantum Theory

[Book 4 section 21.20]

**Books for Study:**

1. Solid State Physics by S O Pillai, New age international Publishers 8<sup>th</sup> edition(2018)
2. Solid State Physics Structure and Properties of materials 2<sup>nd</sup> Edition, MA Wahab Narosa publishing house (2005)
3. Fundamentals of Molecular Spectroscopy-Colin N. Banwell and Elaine M. Mc Cash, 5<sup>th</sup> edition Tata McGraw-Hill Publishing Company Ltd.
4. Optics by N.Subrahmniam, Brijlal and Dr. M.N Avandhalu, 25<sup>th</sup> revised edn

**Books for Reference**

1. Introduction to Solid State Physics, Charles Kittel, Wiley and Sons, 8th Edition.
2. Solid state Physics, Saxena, Guptha, Mandal, PragathiPrakashan
3. Solid State Physics by J.Dekker, MacMillan India Ltd
4. Elementary Solid State Physics by M.A.Omar, Pearson Education
5. Introduction to Spectroscopy, Donald L Pavia Cengage Learning Pvt Ltd



## MARKS INCLUDING CHOICE

| Unit | Marks |
|------|-------|
| I    | 14    |
| II   | 5     |
| III  | 14    |
| IV   | 12    |
| V    | 13    |
| VI   | 2     |

## PATTERN OF QUESTIONS

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                           | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                             | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                           | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                             | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                           | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -60</b></li><li>• <b>Maximum marks of the course-40</b></li></ul> |                        |                                  |

## CORE COURSE XI :OPTICS &PHOTONICS

| SEMESTER  | COURSE CODE    | HOURS<br>PER WEEK | CREDIT   | EXAM<br>HRS |
|-----------|----------------|-------------------|----------|-------------|
| <b>VI</b> | <b>6B11PHY</b> | <b>4</b>          | <b>4</b> | <b>3</b>    |

### COURSE OUTCOME

**CO 1: Understand the concept of interference and diffraction**

**CO2: Distinguish between Fresnel and Fraunhofer diffraction**

**CO3: Analyse mathematically diffraction pattern due to slits and apertures**

**CO4: Understand the concept of polarization and double refraction**

**CO5: Understand the basic principle and working of lasers**

**CO6: Explain different types of lasers**

**CO7: Understand the principle of holography and its applications**

**CO8: Understand the principle of total internal reflection and propagation of light through optical fibres**

**CO9: Compare different types of optical fibres and their applications**  
**Optics and Photonics**

**Unit 1: Two beam interference by division of wave front 8hrs**

Introduction-Interference pattern produced on the surface of water-Coherence—Interference of light waves- The interference pattern-Intensity distribution-Fresnel biprism-Interference with white light-Displacement of fringes-The Lloyd's mirror-Phase change on reflection.

[Book1 sections 14.1-14.6, (14.6.1excluded), 14.8-14.12]

**Unit 2: Interference by division of amplitude 10hrs**

Introduction-Interference by a parallel film when illuminated by a plane wave-The cosine law-Non-reflecting films-Highly reflecting films by thin film deposition-Interference by a film with two non-parallel reflecting surfaces-Colour of thin films-Newton's Rings (reflected system)-Michelson's Interferometer-determination of wavelength of monochromatic source

[Book1 sections 15.1-15.4(15.4.1,15.4.2 excluded)15.5,15.7-15.11]

**Unit3:Fraunhofer Diffraction 8hrs**

Introduction-Single slit diffraction pattern-Position of maxima and minima-Two slit Fraunhofer diffraction pattern-position of maxima and minima-N slit diffraction

pattern- position of maxima and minima-Width of principal maxima-The plane diffraction grating- Grating spectrum-Resolving power of a grating-resolving power of a prism  
[Book1 sections18.1-18.2,18.6-18.8]

#### **Unit4: Fresnel Diffraction**

**7hrs**

Introduction-Fresnel half period zones-Diffraction by a circular aperture-Diffraction by an opaque disc-The zone plate- comparison between zone plate and convex lens-Diffraction by a straight edge  
[Book1 sections20.1-20.3, 20.6]

#### **Unit5:Polarization and Double refraction**

**11hrs**

Introduction- Malus's law- Polarization by reflection-Brewster's law- Nicol prism-Polarization by scattering- -Superposition of two disturbances-Mathematical analysis-The phenomenon of double refraction-Interference of polarized lights-Quarter wave and Half wave plates-Analysis of polarized light.  
[Book1Chapter 22.1-22.7]

#### **Unit 6: Photonics**

**20 hrs**

**Lasers**-introduction-Interaction of light with matter-Einsteins coefficients and their relations-light amplification-meeting the three requirements-components of a laser-lasing action-principal pumping schemes-role of resonant cavity-types of lasers-Ruby laser-He-Ne laser-semiconductor laser-laser beam characteristics-applications\*

[Book2 sections 22.1, 22.4-22.11, 22.14-22.17]

**Holography**-Introduction-principle of holography-recording and reconstruction-holograms-holography and photography-important properties of holograms-applications\*

[Book2 sections 23.1-23.2,23.6,23.6.2,23.7,23.9]

**Fibre optics**-optical fibre-total internal reflection-propagation of light through optical fibre-fractional refractive index-numerical aperture-classification of optical fibres-the three types of fibres-applications\*-fibre optic communication system-merits of optical fibres

[Book2 sections 24.1-24.6,24.10-24.11,24.20-24.22]

**\*Applications of Lasers, Holography and optical fibres –self study by students**

**Book for study:**

1. Optics by AjoyGhatak (6<sup>th</sup> Edition) -Tata MC Graw hill publishing company
2. A text book of Optics by Dr.N.Subramhaniam ,Brijlal, Dr. M.N Avandhalu, 25<sup>th</sup> Revised Edn-S Chand

**Books for Reference :**

1. Optics –Frank L .Pedrotti, S J Leno S Pedrotti, Leno M Pedrotti
2. Geometrical and Physical optics by P.K.Chakroborthy
3. Optics by Eugene Hecht & A R Ganesan

## MARKS INCLUDING CHOICE

| Unit | Marks |
|------|-------|
| I    | 8     |
| II   | 10    |
| III  | 6     |
| IV   | 6     |
| V    | 12    |
| VI   | 18    |

## PATTERN OF QUESTIONS

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                           | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                             | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                           | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                             | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                           | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -60</b></li><li>• <b>Maximum marks of the course-40</b></li></ul> |                        |                                  |

## CORE COURSE XII

### 6B12 PHY NUCLEAR, PARTICLE & ASTROPHYSICS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| 6        | 6B12PHY     | 4              | 4      | 3        |

### COURSE OUTCOME

- CO 1: Understand the structure nucleus and nuclear constituents**  
**CO2: Define nuclear forces and nuclear reactions**  
**CO3: Familiarize elementary particles and their properties**  
**CO4: Understand stellar classifications**  
**CO5: Understand basic concepts of birth of the star**  
**CO6: Identify different stars in HR diagram**  
**CO7: Understand the theory of death of the star**  
**CO8: Define white dwarf, neutron star and black hole**

#### **Unit I – Nuclear Structure and Radioactivity 14 Hrs**

Nuclear Constituents – Nuclear sizes and shapes – Nuclear masses and binding energies – Nuclear force – Radioactive decay – Conservation laws in radioactive decay – Alpha decay – Beta decay – Gamma decay – Natural radioactivity – Mossbauer effect

**[Book 2; Sections 12.1 to 12.11]**

#### **Unit II– Nuclear Reactions and Applications 12 Hrs**

Types of nuclear reactions – Radioisotope production in nuclear reactions – Low-energy reaction kinematics – Fission – Fission reactors – Fusion – Fusion processes in stars – Fusion reactors – Applications of nuclear physics – Neutron activation analysis, Medical radiation physics, Alpha decay applications, Synthetic elements

**[Book 2; Sections 13.1 to 13.6]**

#### **Unit III Elementary Particles 10 Hrs**

The four basic forces – Particles and antiparticles – Families of particles – Conservation laws – Particle interactions and decays – Resonance particles – Energetics of particle decays – Energetics of particle reactions – The Quark Model – The Standard Model

**[Book 2; Sections 14.1 to 14.9]**

**Unit IV Basic Tools of Astronomy****14Hrs**

Stellar distance-relationship between stellar parallax and distance — brightness and luminosity –relation between luminosity, brightness and distance Magnitudes-Apparent magnitude and brightness ratio-relationship between apparent magnitude and absolute magnitude-Colour and temperature of the star-relationship between flux, luminosity and radius-stellar spectra-stellar classification-HertzsprungRussel diagram-H-R diagram and stellar radius- -H-R diagram and stellar luminosity-H-R diagram and stellar mass

**[Book 1 sections 1.1 to 1.12 ][sections 1.1.1,1.3.1,1.4.1,1.5.1and 1.8.1 are excluded]**

**Unit V Stars****14Hrs**

Star clusters, Red Giants and the H-R Diagram -The Death of Stars-The Asymptotic Giant Branch- Dredge-Ups- Mass Loss and Stellar Winds- Infrared Stars-The End of an AGB Star's Life.- White Dwarf Stars- High-Mass Stars and Nuclear Burning - The End Result of High-Mass Stars' Evolution: Pulsars, Neutron Stars, and Black Holes

**[Book 1 sections 3.11, 3.14, 3.15, 3.16, 3.17 ,3.18 ,3.19, 3.21 ,3.21.1, 3.21.2 ,3.21.3 3.21.4 ,3.22 ,3.24.1, 3.24.2] [sections 3.19.1,3.21.2 are excluded]**

**Books for study**

1. Astrophysics is Easy: An introduction for the Amateur Astronomer- Mike Inglis- Springer
2. Modern Physics ( second edition) by Kenneth Krane, Wiley student edition

**Books for reference**

1. Modern Physics by R. Murugesan ,Er. KrithigaSivaprasath-( revised Edition), S.Chand
2. Nuclear Physics by S.N.Ghoshal- S.Chand and Co
3. The Atomic nucleus by R.D Evans -McGrawHill,Newyork

**MARKS INCLUDING CHOICE**

| Unit | Marks |
|------|-------|
| I    | 14    |
| II   | 10    |
| III  | 10    |
| IV   | 14    |
| V    | 12    |

## PATTERN OF QUESTIONS

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                              | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                              | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                              | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -60</b></li> <li>• <b>Maximum marks of the course-40</b></li> </ul> |                        |                                  |

## CORE COURSE XIII :ELECTRODYNAMICS AND CIRCUIT THEORY

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| VI       | 6B13PHY     | 3                 | 3      | 3           |

### COURSE OUTCOME

**CO 1 : Understand the basic concepts of Electrodynamics**

**CO2 : Explain the mathematical theory of Electromagnetic waves**

**CO3 : Understand different Network theorems**

**CO4 : Understand the basic concepts of Transient currents**

#### Unit I: Electrodynamics

16Hrs

Ohm's law - Electromotive force – Motional e.m.f - Electromagnetic induction- Induced electric field - Inductance –Self inductance and mutual inductance –Inductance of coupled coils – Energy in a magnetic field –Electrodynamics before Maxwell-How Maxwell fixed Ampere's law– Maxwell's equations – 'Magnetic charge' –Maxwell's equations inside matter - -boundary conditions- Conservation laws-Charge and energy- The continuity equation – Poynting's theorem- Newton's third law in electrodynamics – Potential formulations of electrodynamics – Scalar & vector potentials- Gauge transformations-Coulomb Gauge and Lorenz Gauge .

(Book 1 sections 7.1, 7.2, 7.3, 8.1, 8.2.1,10.1)

#### Unit II: Electromagnetic Waves

12Hrs

Introduction –The wave equation in one dimension – Sinusoidal waves –Boundary conditions – Reflection and transmission – Polarization - Electromagnetic waves in vacuum- The wave equation for E & B –Monochromatic plane waves –Energy and momentum in electromagnetic waves –Propagation in linear media –Reflection and transmission at normal incidence.

(Book 1 sections 9.1, 9.2, 9.3.1, 9.3.2)



**Unit III: Network Theorems****10Hrs**

DC Network theorems:-Kirchoff's laws –voltage and current sources-source conversion-superposition theorem- Maximum power transfer theorem- Reciprocity theorem- Thevenin's and Norton's theorems –equivalent circuits-star/delta ,delta/star transformations  
(Book 2 sections 2.2,2.15,-2.18,2.21,2.22,2.25,2.30)

**Unit IV: Transient Currents****10Hrs**

Charging of a capacitor , time constant ,Discharging of a capacitor ,transient relations during capacitor charging cycle , transient relations during capacitor discharging cycle , AC through Resistance , Inductance and Capacitance , AC through L and R , Power factor , Q factor of a coil , AC through R and C , AC through Series LCR , Resonance in LCR , Q factor of series LCR

(Book 2 5.18 - 5.22,11.28 -11.30,11.32,13.1,13.2,13.5,13.,713.9,13.10;13.17)

**Books for study:**

1. Introduction to electrodynamics -David .J .Griffiths 3<sup>rd</sup> edition
2. A text book of Electrical Technology, Volume 1, 24<sup>th</sup> Edn., B.L. Theraja & A.K. Theraja.

**Books for Reference:**

1. Feynman lectures on Physics Volume II
2. Schaum's outline of Theory and Problems of Electromagnetism.

**MARKS INCLUDING CHOICE**

| Unit | Marks |
|------|-------|
| I    | 20    |
| II   | 15    |
| III  | 13    |
| IV   | 12    |

## PATTERN OF QUESTIONS

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                              | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                              | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                              | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -60</b></li> <li>• <b>Maximum marks of the course-40</b></li> </ul> |                        |                                  |

### CORE COURSE XIV: DISCIPLINE SPECIFIC ELECTIVE

| COURSE CODE | COURSE TITLE       |
|-------------|--------------------|
| 6B14 PHY(1) | PYTHON PROGRAMMING |
| 6B14 PHY(2) | NANOSCIENCE        |
| 6B14 PHY(3) | MATERIAL SCIENCE   |
| 6B14 PHY(4) | COSMOLOGY          |
| 6B14 PHY(5) | PLASMA PHYSICS     |

### 6B14PHY(1).PYTHON PROGRAMMING

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| VI       | 6B14PHY 1   | 2                 | 2      | 3           |

### COURSE OUTCOME

**CO 1: Develop skills in creating program sketches of scientific problems**

**CO2: Develop basic skills in logical thinking and programming**

**CO3: To make real-life scientific problems easier on a computer with user interaction and graphics**

### Unit I: Introduction to Python Programming

**12 hrs**

Introduction to Python language- Python interpreter -interactive and script modes- Variables and data types-Numbers, None, Sequences-string (create, access and manipulate string)-list (create, access and manipulate list objects)-tuple-Mutable and immutable variables-Operators and Operands-arithmetic, relational, logical and assignment operators-Expressions and Statements-Precedence of operators-Input and Output-Comments in python- File input/output-*Programming exercises with applications in Physics*

## **Unit II: Functions in Python**

**6 hrs**

Functions- Parameters and Arguments-Modules (NumPy and Mathplotlib modules)-Use of Modules in Program (Import and From)-Python packages-Built-in and User defined functions- Composition of functions-Recursion-Vectorised functions- *Programming exercises with applications in Physics*

## **Unit III Conditional and Looping constructs in Python**

**5 hrs**

Control flow structure- if, elif and else-Nested condition- Looping Constructs- While and For loops- Nested loops-Break and Continue statements- *Programming exercises with applications in Physics*

## **Unit IV: Arrays and Matrices in Python**

**5 hrs**

Creating arrays and Matrices using functions Arrange, Linspace, Zeros, Ones, Reshape- Arithmetic operations- cross product- dot product - Matrix inversion-Saving and Restoring arrays - *Programming exercises with applications in Physics*

## **Unit V: Data visualization and Introduction to Numerical Methods**

**4 hrs**

Plotting functions- Plot, Show, Subplot, Polar and Pie functions-Plotting Sine function- Derivative of a function- *Programming exercises with applications in Physics*

### **Suggested Programming exercises (2 hours from each module; 10 hours):**

Calculate the solar mass, Moment of inertia about center of mass (Sphere and Cylinder), Half-life period of a radioactive material, Calculate Rydberg's constant, Newton's law of gravitation, Heisenberg's uncertainty relation, Capacitor discharge in an RC circuit, Plot relativistic and classical momentum against velocity (velocity range  $0c$  to  $0.9c$ , where  $c$  is the velocity of light), Planck's law – plot 'Planck curves', Planetary motion - plot the actual orbits of the planet for three eccentricities, Projectile motion – plot  $x(t)$  and  $y(t)$  for different values of  $\theta$ , Emission lines of hydrogen atom using Rydberg's formula (wavelengths), Derivative of Sine function.

### **Books for reference:**

Any standard book can be used as reference. Use of GNU/Linux platforms may be encouraged.

1. Python for Informatics, Charles Severance
2. Core Python Programming, Wesley J Chun, Pearson Education
3. Python Essential Reference, David M. Beazley, Pearson Education
4. A Primer on scientific Programming with Python by Hans Petter Langtangen ; Springer
5. Python tutorial release 2.6.1 by Guido Van Rossum, Fred L Drake (<http://www.altway.com/resources/python/tutorial.pdf>)
6. How to Think Like a Computer Scientist: Learning with Python, Allen Downey , Jeffrey Elkner, Chris Meyers, <http://www.greenteapress.com/thinkpython/thinkpython.pdf>
7. Numerical Methods in Engineering and Science, Dr. B S Grewal, Khanna Publishers, New Delhi
8. Introductory methods of numerical analysis, S.S. Shastri , (Prentice Hall of India, 1983)
9. Programming exercises with applications in physics - Morten Hjorth-Jense ([https://www.uio.no/studier/emner/matnat/ifi/IN1900/h17/ressurser/physics\\_exer.pdf](https://www.uio.no/studier/emner/matnat/ifi/IN1900/h17/ressurser/physics_exer.pdf))

**Note:** *This course introduces programming in the high level language Python. Examples and exercises must be taken from natural science, and instructors must show how problems in physics can be solved by means of mathematics and programming. Instructors can select suitable exercises from the list provided to introduce the content of different modules.*

### MARKS INCLUDING CHOICE:

| Unit | Marks |
|------|-------|
| I    | 18    |
| II   | 10    |
| III  | 10    |
| IV   | 12    |
| V    | 10    |

### PATTERN OF QUESTIONS

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                           | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                             | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                           | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                             | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                           | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -60</b></li><li>• <b>Maximum marks of the course-40</b></li></ul> |                        |                                  |

## 6B14PHY(2) NANOSCIENCE

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| VI       | 6B14PHY 2   | 2              | 2      | 3        |

### COURSE OUTCOME

**CO 1: Understand the basic concepts of Nanoscience**

**CO2: Understand the properties of materials in the nano range**

**CO3: Identify different techniques for the production of nanomaterials**

**CO4: Understand characterization techniques & applications of nanomaterial.**

#### **Unit I-Nanoscience: Introduction**

**4 hrs**

History of nanoscience- Definition of nanometer, nanomaterials and nanotechnology- classification of nanostructured materials with examples-increased surface area of nanoparticles  
(Book 1, Chapter 1, 1.1 to 1.3.2)

#### **Unit II- Properties of materials in the nano-regime**

**9 hrs**

Effect of size reduction on bulk materials- Optoelectronic property of bulk and nanostructures- relation between optical properties and electronic structure- electronic structure and Fermi surfaces- electron –Phonon coupling- size effect on physical properties- Luminescence from nanoparticles-thermodynamics of nanoparticles

(Book 1, Chapter 2, 2.7 to 2.12, exclude 2.11)

#### **Unit III- Synthesis of Nanomaterials**

**6 hrs**

Bottom Up approaches- Sol-gel technique- thin film growth-physical vapour deposition-chemical vapour deposition- top-down approaches-ball milling-lithography

(Book 1, Chapter 4, 4.4 to 4.4.2.4)

#### **Unit IV-Characterization of Nanomaterials**

**8 hrs**

Scanning Electron Microscopy-Transmission Electron Microscopy-Scanning Probe Microscopy- Atomic force Microscopy

(Book 1, Chapter 8, 8.3 to 8.4 and 8.6 to 8.7.1)

#### **Unit V- Application of Nanotechnology**

**5hrs**

Applications in: Material Science- Biology and Medicine-Energy and Environment  
Carbon Nanotechnology: Different carbon structures (fullerenes, Carbon nanotubes- Graphene- Graphite and Diamond) - Applications of different carbon structures

(Book 1, Chapter 10,10.1 to 10.5, 10.8, 10.8.3 to10.8.5)

**Books for Study:**

1. Nanoscience and Nanotechnology: Fundamentals to Frontiers by M S Ramachandra Rao, Shubra Singh, Wiley India Pvt. Ltd.

**Book for References:**

1. T. Pradeep, "Nano: The Essentials", Tata-McGraw Hill Publishers 2007.
2. Introduction to Nanotechnology, Charles P. Poole, Jr. and Frank J. Owens, Wiley
3. Introduction to Nanoscience & Nanotechnology by K. K. Chattopadhyay and A. N. Banerjee, PHI Learning and Private Limited

**MARKS INCLUDING CHOICE:**

| Unit | Marks |
|------|-------|
| I    | 10    |
| II   | 16    |
| III  | 12    |
| IV   | 12    |
| V    | 10    |

**PATTERN OF QUESTIONS**

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                           | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                             | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                           | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                             | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                           | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -60</b></li><li>• <b>Maximum marks of the course-40</b></li></ul> |                        |                                  |



## 6B14PHY(3) MATERIAL SCIENCE

| SEMESTER  | COURSE CODE        | HOURS<br>PER WEEK | CREDIT   | EXAM<br>HRS |
|-----------|--------------------|-------------------|----------|-------------|
| <b>VI</b> | <b>6B14PHY (3)</b> | <b>2</b>          | <b>2</b> | <b>3</b>    |

### COURSE OUTCOME

**CO 1: Understand the basic concepts of material science**

**CO2: Understand the properties of materials**

**CO3: Identify different engineering materials & their properties**

**CO4: Understand the properties & characteristics of semiconducting, insulating & magnetic materials**

#### **Unit I -Materials Science: Introduction**

**3hrs**

Definition –Classification of Engineering materials- Levels of structure- Material Structure  
(**Book 1, Chapter Sections 1,3, 9,10**)

#### **Unit II- Mechanical Properties of metals**

**4hrs**

Types of mechanical properties- Technological properties-Factors affecting mechanical properties  
(**Book 2, sections 6.1-6.30**)

#### **Unit III-Engineering materials**

**14hrs**

Organic materials-types of organic materials-polymers- types of polymerization-strengthening mechanism of polymers-Plastics—Types of plastics-comparison between thermoplastics and thermosetting plastics-rubber-types of rubbers-vulcanization-composite materials-types of composite materials (in detail)-ceramics-classification of ceramics (in detail) Modern Engineering materials-Metallic Glasses-types of metallic glasses-Shape memory alloys-types of shape memory alloys-Application- Nonlinear materials (qualitative)  
(**Book 2, sections 14.1-14.14,14.22-14.31,15.1-15.3,**

**Book 1, Chapter 20 sections 1 to 4)**

#### **Unit IV –Semiconductors, Insulators & magnetic material**

**11hrs**

Bonding ,classification of semiconductors-expression for conductivity-P-N junction-Application of voltage across P-N junction-flow of current & V –I Characteristic of a

P-N junction.-semiconducting materials –semiconductor devices-Insulating materials- electric field-flux density-permittivity-dielectric polarization-polarization mechanisms- capacitor-dielectric properties-dielectric loss-dielectric strength-ferroelectric materials- hysteresis curve- Magnetic materials -Magnetic field-magnetic moment – Origin of magnetic moment-magnetic field strength- flux density-permeability-magnetization- susceptibility-classification of magnetism –magnetic hysteresis-eddy current loss ferrimagnetism- ferrites-classification of magnetic materials.

**(Book 2, sections 18.1-18.28 )**

**Books for Study:**

1. Materials Science, S L Kakkani, AmitKakkani, New Age International Publishers, Second Edition
2. Material Science, R S Kurumi, R S Sedha, S Chand & Company Fifth Edition

**Book for References:**

1. Materials Science and Engineering: An introduction, Wiiliam D Callister Jr., John Wiley and Sons,Inc.

**MARKS INCLUDING CHOICE**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| I           | 6            |
| II          | 10           |
| III         | 24           |
| IV          | 20           |

## PATTERN OF QUESTIONS

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                              | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                              | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                              | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -60</b></li> <li>• <b>Maximum marks of the course-40</b></li> </ul> |                        |                                  |

## 6B14PHY (4): COSMOLOGY

| SEMESTER  | COURSE CODE        | HOURS<br>PER WEEK | CREDIT   | EXAM<br>HRS |
|-----------|--------------------|-------------------|----------|-------------|
| <b>VI</b> | <b>6B14PHY (4)</b> | <b>2</b>          | <b>2</b> | <b>3</b>    |

### COURSE OUTCOME

**CO 1: Understand history of cosmology at different era**

**CO2: Explain general theory of relativity and curvature of space**

**CO3: Understand cosmological principle and Friedmann model**

**CO4: Explain expansion of universe based on Hubble's law and to state big bang theory**

#### **Unit 1**

**6 hrs**

A brief History- the universe in myth - the Greek- the renaissance- towards the modern era- cosmology today **( Chapter 1)**

#### **Unit II.**

**8 hrs**

Einstein and all that- universal gravitation- the Einstein revolution- the equivalence principle- the general theory of relativity- the curvature of space- black holes and the universe **( Chapter 2)**

#### **Unit III**

**8 hrs**

First principles- simplicity and symmetry- the cosmological principle- the Friedman models- the singular nature of gravity **( Chapter 3)**

#### **Unit IV**

**10 hrs**

The expanding universe- Hubble's law- Doppler shift- Interpreting the Hubble Law- the quest for  $H_0$ - the age of the universe- the big bang **( Chapter 4)**

#### **Books for study**

1. Cosmology – A Very Short Introduction by Peter Coles ( OXFORD)

## MARKS INCLUDING CHOICE

| Unit | Marks |
|------|-------|
| I    | 12    |
| II   | 14    |
| III  | 14    |
| IV   | 20    |

## PATTERN OF QUESTIONS

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                           | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                             | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                           | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                             | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                           | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -60</b></li><li>• <b>Maximum marks of the course-40</b></li></ul> |                        |                                  |

## PLASMA PHYSICS

| SEMESTER | COURSE CODE  | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|--------------|----------------|--------|----------|
| 6        | 6B 14 PHY(5) | 2              | 2      | 3        |

### COURSE OUTCOME

**CO 1: define plasma and plasma parameters**

**CO2: understand applications of plasma**

**CO3: determine the behavior of plasma in various E and B Fields**

**CO4: determine the nature of plasma as a fluid**

### **Unit I Introduction**

**8 hrs**

Definition of plasma –Concept of temperature-Debye shielding-the plasma parameter-Criteria for Plasma-Applications of Plasma Physics-M.H.D Energy Conversion and ion propulsion-solid state plasmas- Gas Lasers

**(Book for study 1.1,1.2,1.3.1.4,1.5,1.6,1.7)**

### **Unit II Single Particle Motion**

**12hrs**

Introduction-Uniform E and B fields- gravitational field-non uniform B field- time varying E field- time varying B field- summary of guiding centre drifts

**(Book for study 2.1,2.2,2.3,2.5,2.6,2.7)**

### **Unit III Plasma as Fluids**

**12 hrs**

Introduction-Relation of plasma physics to ordinary electromagnetics- the equation of motion-the convective derivative-collisions-equation of continuity-equation of state- the complete set of fluid equations

**(Book for study 3.1,3.2,3.3 [3.32excluded])**

### **Book for study**

1.Introduction to Plasma Physics and Controlled Fusion by Francis F.Chen  
( 3<sup>rd</sup> edition) -Springer

### **Books for reference**

- 1.Plasma Physics by S.N.Sen
2. Plasma Physics –an Introduction by Richard Fitzpatrick

### Marks including choice

| Unit | Marks |
|------|-------|
| I    | 18    |
| II   | 22    |
| III  | 20    |

### PATTERN OF QUESTIONS

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (8 questions x Marks 2 each =16) |
|                                                                                                                                           | Answer any 6 questions | (6questions x Marks 2 each=12)   |
| <b>Part C</b>                                                                                                                             | <b>Problems</b>        | (6 questions x Marks 3 each =18) |
|                                                                                                                                           | Answer any 4 questions | ( 4 questions x Marks 3 each=12) |
| <b>Part D</b>                                                                                                                             | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                           | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -60</b></li><li>• <b>Maximum marks of the course-40</b></li></ul> |                        |                                  |

### **CORE COURSE XV: Practical II General Physics II**

| <b>Semester</b> | <b>Course code</b> | <b>Hours per week</b> | <b>Credit</b> | <b>Exam hours</b> |
|-----------------|--------------------|-----------------------|---------------|-------------------|
| <b>VI</b>       | <b>6B15PHY</b>     | <b>4</b>              | <b>4</b>      | <b>3</b>          |

### **COURSE OUTCOME**

**CO1 : Familiarise with apparatus for mechanical, electrical, magnetic and optical experiments.**

**CO2: Develop skill in setting up of apparatus for accurate measurement of physical quantities.**

**CO3: Understand multiple experimental techniques for determining physical quantities.**

**CO4: Develop skill in systematic way of measurements by minimising possible errors.**

**CO5: Develop skill to analyse by plotting graphs using software.**

**CO6: Develop skill for systematic trouble shooting.**

**CO7: Perform error analysis for experiments.**

Note: A brief theoretical back ground of each experiment must be given to the students before each cycle of experiments and assess it. Students have to maintain a practical log book regularly signed by the teacher in charge and to be submitted at the time of University Examination. Fair record is not required. All the 20 experiments have to be performed.

### **Special Instructions**

1. For plotting graphs of experiments mentioned, any software (excel, origin etc) must be used.
2. Error analysis should be done for the mentioned experiments.

### **LIST OF EXPERIMENTS**

1. Spectrometer –i-d curve (Graph using software)
2. Spectrometer –i-i' curve (Graph using software)
3. Spectrometer-Cauchy's constants assuming wavelengths
4. Spectrometer –grating-normal incidence
5. Spectrometer –grating- minimum deviation



6. Air Wedge-Diameter of a thin wire
7. Newton's Rings- wavelength of sodium light
8. Laser-Slit width from diffraction pattern
9. Potentiometer- Calibration of ammeter (Graph using software)
10. Potentiometer-Calibration of High range voltmeter (Graph using software)
11. Potentiometer-Reduction factor of TG and  $B_0$ (Error analysis is required)
12. Circular coil - Determination of  $m$  and  $B_0$  (Error analysis is required)
13. Carey Fosters' Bridge-Temp-coefficient of resistance
14. Conversion of Galvanometer into voltmeter- calibration using potentiometer
15. Conversion of Galvanometer into ammeter- calibration using potentiometer
16. Verification of Thevenin's and Norton's theorem
17. Verification of Maximum Power Transfer Theorem
18. Mirror Galvanometer-Figure of Merit
19. Ballistic Galvanometer- absolute capacity of a capacitor
20. Ballistic Galvanometer- high Resistance by Leakage (Error analysis is required)

**Reference Books**

1. Practical Physics by P R Sasi Kumar PHI Learning Private Limited
2. BSc Practical Physics by C L Arora ,S Chand
3. An advanced course in Practical Physics by D.Chattopadhyay& P C Rakshit New Central Book Agency(P)Ltd

**MARKS DISTRIBUTION**

| Sections                                                       | Marks |
|----------------------------------------------------------------|-------|
| I Principle with theory                                        | 10    |
| II Performance                                                 | 6     |
| III Observation                                                | 14    |
| IV Viva to evaluate the skill & knowledge about the experiment | 4     |
| V Calculation ,Graph etc                                       | 6     |

### **CORE COURSE XVI: PRACTICAL III ELECTRONICS**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>VI</b>       | <b>6B16PHY</b>     | <b>4</b>                  | <b>4</b>      | <b>3</b>            |

#### **COURSE OUTCOME**

**CO1: Familiarise active and passive electronic components.**

**CO2: Familiarise multimeter, power supply, signal generator and cathode ray oscilloscope.**

**CO3: Develop skill in soldering and use of breadboard.**

**CO4: Develop skill in construction of rectifiers, voltage regulators, amplifiers and oscillators.**

**CO5: Observe, measure and analyse electrical signals.**

**CO6: Develop skill for trouble shooting circuits and components.**

**CO7: Develop skill to analyse by plotting graphs using software.**

Note: A brief theoretical background of each experiment must be given to the students before each cycle of experiments. Students have to maintain a practical log book regularly signed by the teacher in charge and to be submitted at the time of University Examination. Fair record is not required. All the 20 experiments have to be performed. Students may refer the diode/transistor/IC data manual to get details of the components.

1. Characteristics of a semiconductor diode
2. Half wave & Full wave (2 diodes) Rectifiers - Study of ripple factor with and without filter (by soldering)
3. Bridge Rectifier- Study of ripple factor with and without filter (by soldering)
4. Voltage multiplier (Quadrupler) circuit (by soldering)
5. Voltage regulator using Zener diode after finding Zener voltage (Line and Load regulations)
6. Common Emitter characteristics of BJT
7. Realization of basic logic gates (OR, AND & NOT) using transistors (by soldering)
8. Single stage Common Emitter amplifier - Gain and Frequency response (by soldering)
9. Power amplifier (Class A) using transistor - Frequency response and band width
10. Voltage series and Current series Feedback circuits using transistors
11. Single transistor voltage regulator (Line and Load regulations)
12. Hartley Oscillator using transistor (by soldering)

13. Phase Shift Oscillator using transistor
14. Astable Multi vibrator using transistors
15. Inverting amplifier, Non-inverting amplifier and voltage follower using Op-amp
16. Summing and Difference amplifier using Op-amp
17. Differentiator and Integrator using Op-amp
18. Wien Bridge Oscillator using Op-amp
19. Half and Full Adders using XOR and NAND gates
20. Minimization of a three variable Boolean expression/Truth table using Karnaugh Map and realization using NAND gates.

### References:

1. Electronics Lab Manual - Dr. K A Navas (Rajath Publishers, Vol. I & II)
2. Advanced Practical Physics - S P Singh (Pragati Prakashan Meerut, Vol. II)
3. The Art of Electronics - Paul Horowitz and Winfield Hill (Cambridge University Press)
4. BSc Practical Physics - C L Arora (S Chand & Co.)
5. A text book of Advanced Practical Physics - Samir Kumar Ghosh (New Central Book Agency)

### MARKS DISTRIBUTION

| Sections                                                       | Marks |
|----------------------------------------------------------------|-------|
| I Principle with theory                                        | 10    |
| II Performance                                                 | 6     |
| III Observation                                                | 14    |
| IV Viva to evaluate the skill & knowledge about the experiment | 4     |
| V Calculation ,Graph etc                                       | 6     |

## 6B17 PHY PROJECT EXTERNAL EVALUATION MARK DISTRIBUTION

| <b>Sections</b>                       | <b>Marks</b> |
|---------------------------------------|--------------|
| I Relevance of topic                  | 10%          |
| II Methodology                        | 20%          |
| III Quality of analysis<br>& findings | 20%          |
| IV Viva -Voce                         | 50%          |

**PART B:**  
**PHYSICS COMPLEMENTARY ELECTIVE COURSES**  
**[FOR BSc PROGRAMMES]**  
**WORK AND CREDIT DISTRIBUTION**  
**( 2019 ADMISSION ONWARDS )**

| COURSE CODE | COURSE TITLE                              | SEMESTER | HOURS PER WEEK | CREDIT | EXAM HOURS | MARKS |     |       |
|-------------|-------------------------------------------|----------|----------------|--------|------------|-------|-----|-------|
|             |                                           |          |                |        |            | CE    | ESE | TOTAL |
| 1C01PHY     | MECHANICS                                 | I        | 2              | 2      | 3          | 8     | 32  | 40    |
| 2C02PHY     | ELECTRICITY, MAGNETISM AND THERMODYNAMICS | II       | 2              | 2      | 3          | 8     | 32  | 40    |
| 3C03PHY     | OPTICS AND PHOTONICS                      | III      | 3              | 2      | 3          | 8     | 32  | 40    |
| 4C04PHY     | ELECTRONICS AND MODERN PHYSICS            | IV       | 3              | 2      | 3          | 8     | 32  | 40    |
| 4C05PHY     | PHYSICS PRACTICAL                         | IV       | 2              | 4      | 3          | 8     | 32  | 40    |

**EVALUATION**

| ASSESSMENT | WEIGHTAGE |
|------------|-----------|
| EXTERNAL   | 80%       |
| INTERNAL   | 20%       |

**INTERNAL ASSESSMENT THEORY**

| COMPONENT*                                 | WEIGHTAGE** | REMARKS         |
|--------------------------------------------|-------------|-----------------|
| COMPONENT 1<br>Test paper                  | 60%         | Best of any two |
| COMPONENT 2<br>Assignment<br>/Seminar/Viva | 40%         | One             |

### CONTINUOUS INTERNAL ASSESSMENT PRACTICAL

| <b>COMPONENT*</b>          | <b>WEIGHT<br/>AGE**</b> | <b>REMARKS</b>                                                                                                                  |
|----------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| COMPONENT 1<br>Lab Skill   | 25%                     |                                                                                                                                 |
| COMPONENT 2<br>Punctuality | 25%                     |                                                                                                                                 |
| COMPONENT 3<br>Record      | 25%                     | A logbook of practicals should be maintained which must include theory, observation, tabulation, calculation, graph, result etc |
| COMPONENT 3<br>TEST PAPER  | 25%                     | A model exam should be conducted before external examination & should be considered for internals                               |

## COMPLEMENTARY ELECTIVE COURSE I: -MECHANICS

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| I        | ICO1PHY     | 2                 | 2      | 3           |

### COURSE OUTCOME

**CO 1: Understand the basic concepts of Properties of matter**

**CO2: Explain the dynamics of rigid bodies.**

**CO3: Understand the basic concepts of wave motion and oscillations**

#### UNIT 1: Properties of matter :13 Hours

**Elasticity:** Hooke's law, moduli of elasticity- Poisson ratio, Twisting Couple on a cylindrical rod- Bending of Beams-Bending Moment, Cantilever, Transverse vibrations of a loaded cantilever, Uniform and Non-uniform Bending, Determination of Young modulus using uniform bending – mirror and telescope method

**Viscosity:** Viscosity, Critical velocity, Flow of liquid through a capillary tube, Poiseuille's formula, Stokes formula.

**Surface tension:** Surface energy - expression for excess pressure on a curved surface – Capillary action – Explanation of capillary action - Measurement of surface tension by capillary tube method

**(Book 1: Section – 12.1-12.10, 12.13-12.14, 12.15-12.23, 14.1-14.3, 14.6, 15.1-15.4, 16.1-16.13.16.21-16.22)**

#### UNIT 2: Dynamics of Rigid Bodies: - 6 Hours

Rigid body , Centre of mass , Angular momentum and Torque, Moment of inertia , Radius of gyration, Theorems on moment of Inertia, Moment of inertia of thin Rod, Circular Disc, Annular Ring, Cylinder ( solid and hollow) and Sphere (solid). Moment of inertia of fly wheel

**Book 1: Section – 6.2, 8.1, 8.5- 8.6.8.9)**

#### UNIT 3: Oscillation and waves: (13 Hours)

**Harmonic Oscillator :** Periodic motion, Simple harmonic oscillator, Energy of Simple harmonic oscillator, Compound Pendulum , Torsion pendulum, Damping force , Damped Harmonic oscillator , Quality factor, Galvanometer with low damping , LCR circuit

**Wave Motion:** General equation of wave motion, Plane progressive harmonic wave, Energy density and Energy flow/current for plane progressive wave, Transverse waves in stretched strings, Longitudinal waves in rods and gases, Stationary waves, Waves in a linear bounded medium, Flow of energy in stationary waves.

**Book 1: Section – 9.1- 9.4, 9.8,10.1-10.2, 10.4- 10.5, 11.1-11.4, 11.6- 11.10**

**Books for study:**

1. Mechanics – J.C. Updhyaya
2. Mechanics - D.S.Mathur

**Books for reference:**

1. Feynman lectures on Physics by Richard Feynman
2. Fundamentals of Physics by Resnick & Haliday

**MARKS INCLUDING CHOICE:**

| Unit | Marks |
|------|-------|
| I    | 20    |
| II   | 10    |
| III  | 22    |

**PATTERN OF QUESTIONS**

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (5 questions x Mark 1 = 5)       |
|                                                                                                                                              | Answer all questions   | (5 questions x Mark 1 = 5)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (6 questions x Marks 2 each =12) |
|                                                                                                                                              | Answer any 6 questions | (4questions x Marks 2 each=8)    |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (5questions x Marks 3 each =15)  |
|                                                                                                                                              | Answer any 4 questions | ( 3questions x Marks 3 each=9)   |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -52</b></li> <li>• <b>Maximum marks of the course-32</b></li> </ul> |                        |                                  |



## COMPLEMENTARY ELECTIVE COURSE II: ELECTRICITY, MAGNETISM AND THERMODYNAMICS

| SEMESTER  | COURSE CODE    | HOURS PER WEEK | CREDIT   | EXAM HRS |
|-----------|----------------|----------------|----------|----------|
| <b>II</b> | <b>2CO2PHY</b> | <b>2</b>       | <b>2</b> | <b>3</b> |

### COURSE OUTCOME

**CO 1: Understand the basic concepts of Magnetism & electricity**

**CO2: Explain the magnetic effects of electric currents**

**CO3: Understand the basic principles of Thermodynamics**

#### **UNIT 1: Magnetism and Electricity**

**10 Hours**

**Magnetism:** Magnetic properties of materials – Magnetic Induction, Magnetisation, Relation between the three magnetic vectors B, H and M, Magnetic susceptibility, Magnetic permeability, properties of Dia, Para and Ferro magnetic materials, Anti ferromagnetism and ferrimagnetisms, magnetic element at a place, Deflection magnetometer, Searle’s vibration magnetometer, Box type vibration magnetometer.

**Electricity :** Carey Foster bridge-theory, determination of resistance, resistivity and temperature coefficient, Potentiometer- theory, Calibration of Ammeter, Calibration of Voltmeter (low & High Range) conversion of galvanometer into ammeter and voltmeter.

( **Book 1: Section – 15.1 – 15.9, 42.1, 7.1-7.2, 39.2-39.3, 42.10-42.15** )

#### **UNIT 2: Magnetic effect of electric current**

**9 Hours**

Biot-Savart law, Magnetic induction at a point due to a straight conductor carrying current, Magnetic induction at a point on the axis of a circular coil, Lorentz force, Force on a current carrying conductor, Torque on a current loop in a uniform magnetic field, Theory and working of moving coil Ballistic Galvanometer, figure of merit of B.G and its determination.

( **Book 1: Section – 10.1 - 10.4, 10.7, 10.10-10.13** )

#### **UNIT 3: Thermodynamics**

**13 Hours**

Thermodynamic systems, Thermodynamic processes, Thermodynamic equilibrium, Zeroth law thermodynamics, Work- A path dependent function, Internal Energy, First Law of thermodynamics, Applications of first law, The indicator Diagram, Work done during an Isothermal Process and Adiabatic Process, Adiabatic and Isothermal Elasticises, Second law of thermodynamics, Carnot’s engine , Derivation of efficiency using Carnot’s cycle , Carnot’s theorem , Refrigerator, Coefficient of performance , Concept of entropy, Change of entropy in reversible and irreversible cycles, Principle of increase of entropy.

( **Book 2: Section – 4.1 – 4.7, 4.10-4.15, 4.21-4.29, 5.1-5.6** )

**Books for study:**

1. Electricity and Magnetism (2008th edition)-R.Murugeshan
- 2 Heat and Thermodynamics (16th edition) by Brijlal and Subramanian

**Books for reference:**

1. Electricity and Magnetism-D.N .Vasudeva
2. Heat and Thermodynamics-D.S.Mathur.
3. Introduction to electrodynamics -David .J .Griffiths
4. Heat & Thermodynamics: W.Zemansky, McGraw Hill

**MARKS INCLUDING CHOICE:**

| Unit | Marks |
|------|-------|
| I    | 18    |
| II   | 14    |
| III  | 20    |

**PATTERN OF QUESTIONS**

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (5 questions x Mark 1 = 5)       |
|                                                                                                                                              | Answer all questions   | (5 questions x Mark 1 = 5)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (6 questions x Marks 2 each =12) |
|                                                                                                                                              | Answer any 6 questions | (4questions x Marks 2 each=8)    |
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (5questions x Marks 3 each =15)  |
|                                                                                                                                              | Answer any 4 questions | ( 3questions x Marks 3 each=9)   |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -52</b></li> <li>• <b>Maximum marks of the course-32</b></li> </ul> |                        |                                  |

## COMPLEMENTARY ELECTIVE COURSE III: OPTICS AND PHOTONICS

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| III      | 3C03PHY     | 3                 | 2      | 3           |

### COURSE OUTCOME

**CO 1: Understand the basic concepts of Interference**

**CO2: Understand the basic concepts of Diffraction**

**CO3: Understand the basic concepts of Polarization**

**CO4: Understand the basic concepts of Photonics and Fibre Optics**

#### **UNIT – 1: Interference**

**12 Hours**

Interference of light, principle of superposition, Conditions for maximum and minimum intensities, Coherent sources, Theory of interference fringes, Colours of thin films- interference due to reflected light, Interference due to transmitted light, Fringes produced by a wedge shaped thin film, Newton's Rings by reflected light, Determination of wave length of sodium light and Refractive index of a transparent liquid by Newton's rings.

**(Book 1: Section: 2.1 – 2.2, 2.5 - 2.10)**

#### **UNIT- 2: Diffraction**

**12 Hours**

Fresnel and Fraunhofer diffraction - Fresnel's Explanation of Rectilinear Propagation of light- Zone plate, Diffraction at a straight edge, Fraunhofer Diffraction at a single slit, Plane Transmission Diffraction Grating, Dispersive power of a Grating, Determination of wavelength of light using Transmission Grating. Comparison between interference and Diffraction

**(Book 1: Section: 3.1 – 3.5, 3.7, 3.10, 3.12, 3.14, 3.17, 3.25)**

#### **UNIT - 3: Polarization**

**9 Hours**

Introduction, Polarization of light, Polarization by reflection, Pile of Plate, Law of Malus, Double Refraction, Huygen's theory of double refraction in uniaxial crystal, Nicol Prism, Theory of production of Elliptically and Circularly Polarised light, Quarter wave plates, Half wave plate, Production and detection of Plane, Circularly and Elliptically polarized light

**(Book 1: Section: 4.1-4.6, 4.8, 4.10 - 4.14)**

#### **UNIT– 4: Photonics**

**15 Hours**

**Laser:** Absorption and emission of light, Induced absorption, Spontaneous emission and Stimulated emission, Einstein's relations , Principle of Laser, Meta stable state, Population inversion, Pumping, Pumping methods – Optical pumping, Electrical pumping and Direct conversion, Types of laser - Ruby laser, Helium Neon laser and Semi conductor laser, Properties of laser beams, Applications of lasers-Holography (principle, recording and reconstruction)

**Fibre Optics:** Introduction, Total internal reflection, Step index fibre, Graded index fibre, Light propagation in fibres, Acceptance angle, Numerical Aperture, The Coherent

Bundle, Fibre optic Communication system, Advantage of Fibre – Optic Communication system, Fibre optic sensors, Applications- Fibre optic Communication system.

( **Book 2 : Section – 19.1-19.5** **Book 1: 8.1 – 8.6, 8.10, Ref. Book 3- chapter 38**)

**Books for study:**

1. Optics and Spectroscopy by R Murugesan, Kiruthiga ivaprasath, S Chand
2. Modern Physics by R Murugesan, Kiruthiga Sivaprasath, S Chand

**Books for reference:**

1. Optics by Subramanayam, Brijlal, MN Avadhanalu, S.Chand
2. Optics- Ajay Ghatak
3. Basic Electronics – Solid state – B..L. Thereja
4. Laser fundamentals – Silfast

**MARKS INCLUDING CHOICE:**

| Unit | Marks |
|------|-------|
| I    | 12    |
| II   | 12    |
| III  | 10    |
| IV   | 18    |

**PATTERN OF QUESTIONS**

|               |                        |                                  |
|---------------|------------------------|----------------------------------|
| <b>Part A</b> | <b>Short answer</b>    | (5 questions x Mark 1 = 5)       |
|               | Answer all questions   | (5 questions x Mark 1 = 5)       |
| <b>Part B</b> | <b>Short Essay</b>     | (6 questions x Marks 2 each =12) |
|               | Answer any 6 questions | (4questions x Marks 2 each=8)    |
| <b>Part C</b> | <b>Problems</b>        | (5questions x Marks 3 each =15)  |

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
|                                                                                                                                              | Answer any 4 questions | ( 3questions x Marks 3 each=9)   |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -52</b></li> <li>• <b>Maximum marks of the course-32</b></li> </ul> |                        |                                  |

## COMPLEMENTARY ELECTIVE COURSE IV: ELECTRONICS AND MODERN PHYSICS

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| IV       | 4C04PHY     | 3                 | 2      | 3           |

### COURSE OUTCOME

- CO 1: Understand the basic concepts of Basic electronics**  
**CO2: Understand the basic concepts of Digital electronics**  
**CO3: Understand the basic concepts of Nuclear Physics**  
**CO4: Understand the basic concepts of Particle physics and Astrophysics**

**UNIT – 1: Basic Electronics** **15 Hours**  
 Semiconductors, pn junction, Current-voltage characteristics of pn junction- Forward and Reverse bias, Diode, Half wave, Full wave and bridge rectifier circuits, Efficiency and ripple factor, Filter circuits- capacitor filter and  $\pi$  filters, Zener diode and its characteristics, Voltage stabilization, Transistors- CB, CE, CC Configurations, Characteristics, Current amplification factors, Relation connecting  $\alpha$ ,  $\beta$  and  $\gamma$ , CE Amplifier, Feedback, Principle of negative voltage feedback in Amplifier, Gain and advantage of feedback – Sinusoidal oscillator, Oscillatory Circuit, Positive feedback Amplifier – Oscillator, Colpitt's oscillators and Hartley oscillators.

( **Book 1: 5.1, 5.8 – 5.20, 6.1, 6.7 – 6.11, 6.13 - 6.15, 6.18, 6.20-6.21, 6.25, 6.27 – 6.28, 8.1 – 8.5, 8.7 – 8.10, 8.12 – 8.16, 13.1 – 13.4, 14.1 – 14.3, 14.5, 14.10- 14.11** )

**UNIT2– 2: Digital Electronics** **9 Hours**  
 Introduction, Analogue and Digital signals, Number systems – Decimal, binary, Octal, Hexadecimal number systems- Conversion between different number systems, BCD Code, Logic gates - AND, OR, and NOT Universal gates – NAND and NOR, XOR gate, Boolean Algebra, Boolean Theorems, de Morgan's theorems, Binary Addition, Half adder and Full adder

( **Book 1: Section – 26.1 – 26.17, 26.20 – 26.22, 26.31 – 26.32** )

**UNIT – 3: Nuclear Physics** **12 Hours**  
 Introduction, Classification of Nucleus, General properties of Nucleus, Binding energy, Nuclear Stability, Nuclear force, Stability of nucleus, Radioactivity, Natural radioactivity, Alpha, Beta and Gamma Rays and its Properties, Law of radioactive decay, Half life, Mean life, Radioactive dating – age of the earth, Nuclear fission, Energy Released in Fission, Nuclear reactors, Nuclear fusion, Source of Stellar Energy

( **Book 2: Section – 27.5 – 27.6, 27.7, 31.2-31.6, 31.29 – 31.33, 31.35, 35.2 – 35.3, 35.6- 35.8** )

**UNIT– 4: Particle physics and Astrophysics****12 Hours**

**Particle Physics:** Introduction, Classification of elementary particles – Particles and Anti- particles, Fundamental interaction, , Elementary particle quantum number, Idea of Quarks, The quark model, Compositions of hadrons according to quark model.

**Astrophysics :** Introduction, Classification of stars –The Harvard classification system, Hertzsprung - Russel diagram, Luminosity of a star, Stellar Evolution, Chandrasekhar limit, White dwarfs, Neutron stars, Black Holes , Supernova Explosion.

**(Book 2: Section – 38.1 – 38.2, 38.4 – 38.5, 38.7, 78.1 – 78.6, 78.8 - 78.11**

**Books for study:**

- 1 Principles of Electronics-VK Mehta, S. Chand
- 2 Modern Physics – R .Murugesan and Kiruthiga Sivaprasath , S. Chand

**Books for reference:**

- 1 Basic Electronics – Solid state – B..L. Thereja
- 2 Electronic Devices and Circuits- 5th Edition, David A Bell (Oxford)
- 3 Digital Principles and Applications - D P Leach and A P Malvino (TMH)
- 4 Concepts of Modern Physics, Arthur Beiser, TMH

**MARKS INCLUDING CHOICE:**

| Unit | Marks |
|------|-------|
| I    | 16    |
| II   | 10    |
| III  | 14    |
| IV   | 12    |

**PATTERN OF QUESTIONS**

|               |                        |                                  |
|---------------|------------------------|----------------------------------|
| <b>Part A</b> | <b>Short answer</b>    | (5 questions x Mark 1 = 5)       |
|               | Answer all questions   | (5 questions x Mark 1 = 5)       |
| <b>Part B</b> | <b>Short Essay</b>     | (6 questions x Marks 2 each =12) |
|               | Answer any 6 questions | (4questions x Marks 2 each=8)    |

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part C</b>                                                                                                                                | <b>Problems</b>        | (5questions x Marks 3 each =15)  |
|                                                                                                                                              | Answer any 4 questions | ( 3questions x Marks 3 each=9)   |
| <b>Part D</b>                                                                                                                                | <b>Long Essay</b>      | (4 questions x Marks 5 each =20) |
|                                                                                                                                              | Answer any 2 questions | ( 2 questions x Marks 5 each=10) |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -52</b></li> <li>• <b>Maximum marks of the course-32</b></li> </ul> |                        |                                  |



## COMPLEMENTARY COURSE V – PHYSICS PRACTICAL

| COURSE CODE | COURSE TITLE      | SEMESTER | HOURS PER WEEK | CREDIT | EXAM HOURS |
|-------------|-------------------|----------|----------------|--------|------------|
| 4C05PHY     | PHYSICS PRACTICAL | IV       | 2              | 4      | 3          |

### COURSE OUTCOME

**CO1: Familiarise with apparatus for experiments in mechanics, optics, electricity and magnetism and electronics and electronics experiments.**

**CO2: Develop skill in setting up of apparatus for accurate measurement of physical quantities.**

**CO3: Understand multiple experimental techniques for determining physical quantities.**

**CO4: Develop skill in systematic way of measurements by minimizing possible errors.**

**Note:** A brief theoretical back ground of each experiment must be given to the students before each cycle of experiments . Students are to maintain a practical log book regularly signed by the teacher in charge. Fair record not required. All the experiments are to be done.

### LIST OF EXPERIMENTS

1. Flywheel- Moment of inertia
2. Compound pendulum-determination of  $g$  and  $K$
3. Torsion pendulum- Moment of inertia of a disc
4. Young's modulus - Uniform Bending - using optic lever
5. Young's modulus – Non-uniform bending - using pin and microscope
6. Liquid lens - Refractive Index of material of lens using liquid of known refractive index
7. Spectrometer – Refractive index of the material of a prism
8. Spectrometer – grating-normal incidence
9. Surface tension-Determination of surface tension of given liquid
10. Air Wedge-Diameter of a thin wire
11. Newton's Rings- wavelength of sodium light
12. Deflection Magnetometer – $\tan A$  and  $\tan B$
13. Searle's Vibration magnetometer- magnetic moment
14. Carey Fosters Bridge- resistivity
15. Potentiometer- resistivity
16. Potentiometer- Calibration of ammeter
17. Newton's law of cooling- Specific heat capacity of given liquid
18. Construction of half wave rectifier with and without filter - ripple factor & load regulation

19. Construction of regulated power supply using Zener diode
20. Construction of Logic gates – AND , OR, NOT- verification of truth table

**Reference Books**

1. Practical Physics by P R Sasi Kumar PHI Learning Private Limited
2. BSc Practical Physics by C L Arora ,S Chand
3. An advanced course in Practical Physics by D.Chattopadhyay& P C Rakhit New Central Book Agency(P)Ltd
4. BSc Practical Physics - C L Arora (S Chand & Co.)

**MARK DISTRIBUTION**

| <b>Section</b>                 | <b>Marks</b> |
|--------------------------------|--------------|
| Principle and formula          | 6            |
| Performance                    | 6            |
| Observation                    | 14           |
| Calculation ,Graph &<br>Result | 6            |

**PART C:**  
**GENERIC ELECTIVE COURSES**  
**WORK AND CREDIT DISTRIBUTION**  
**(2019 ADMISSION ONWARDS)**

| <b>COURS<br/>E CODE</b> | <b>COURSE TITLE</b>                                                   | <b>SEMESTER</b> | <b>HOURS<br/>PER<br/>WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HOUR<br/>S</b> | <b>CE</b> | <b>ESE</b> | <b>TOTAL</b> |
|-------------------------|-----------------------------------------------------------------------|-----------------|-------------------------------|---------------|----------------------------|-----------|------------|--------------|
| <b>5D 01<br/>PHY</b>    | <b>INTRODUCTION TO<br/>CLIMATE AND<br/>CLIMATE CHANGE<br/>SCIENCE</b> | <b>V</b>        | 2                             | 2             | 2                          | 5         | 20         | 25           |
| <b>5D 02<br/>PHY</b>    | <b>RENEWABLE<br/>ENERGYSOURCES</b>                                    | <b>V</b>        | 2                             | 2             | 2                          | 5         | 20         | 25           |
| <b>5D 03<br/>PHY</b>    | <b>BIOPHYSICS</b>                                                     | <b>V</b>        | 2                             | 2             | 2                          | 5         | 20         | 25           |
| <b>5D 04<br/>PHY</b>    | <b>JOY OF STAR<br/>WATCHING</b>                                       | <b>V</b>        | 2                             | 2             | 2                          | 5         | 20         | 25           |
| <b>5D 05<br/>PHY</b>    | <b>ELECTRICITY IN<br/>DAILY LIFE</b>                                  | <b>V</b>        | 2                             | 2             | 2                          | 5         | 20         | 25           |
| <b>5D 06<br/>PHY</b>    | <b>INTRODUCTION TO<br/>BASIC ELECTRONICS</b>                          | <b>V</b>        | 2                             | 2             | 2                          | 5         | 20         | 25           |

**EVALUATION**

| <b>ASSESSMENT</b> | <b>WEIGHTAGE</b> |
|-------------------|------------------|
| EXTERNAL          | 80%              |
| INTERNAL          | 20%              |

**INTERNAL ASSESSMENT**

| <b>COMPONENT *</b>             | <b>WEIGHTAGE**</b> | <b>REMARKS</b> |
|--------------------------------|--------------------|----------------|
| COMPONENT 1<br>TEST PAPER      | 70%                | ONE            |
| COMPONENT 2<br>ASSIGNMENT/VIVA | 30%                | ONE            |

**5D01PHY:INTRODUCTION TO CLIMATE AND CLIMATE CHANGE SCIENCE**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>HOURS<br/>PER WEEK</b> | <b>CREDIT</b> | <b>EXAM<br/>HRS</b> |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| <b>V</b>        | <b>5 D 01 PHY</b>  | <b>2</b>                  | <b>2</b>      | <b>2</b>            |

**COURSE OUTCOME**

**CO1:Understand the basic concepts of climate change science**

**CO2:Understand some of the potentially serious consequences of climate change**

**CO3:Analyse linkages between climate change adaptation and development planning.**

**CO4:Describe relevant policy approaches and strategic frameworks for climate change mitigation**

**CO5:Identify international initiatives which support countries to plan for climate change**

**Unit 1: The basics of climate change science.**

**8Hrs**

An overview of key concepts such as weather, climate, and concept of energy balance; the greenhouse gas effect, and their main sources -the circulation in the atmosphere and ocean, and human contribution to climate change - some of the main observed changes in the climate since the industrial revolution- projected future trends and impacts of climate change on surface temperature, precipitation, ocean pH, sea-level and Arctic sea-ice extent. - overview of main sources of scientific climate information, relevant programmes and institutions.

**Unit2: An overview of some of the potential consequences of climate change 5Hrs**

sea level rise- flood, drought, extreme weather events and disruption of the global food supply that could have major negative impacts on humanity- the uncertainties in how the future may unfold, the important concept of risk as a means of dealing with uncertainty, and the different levels of risk associated with different consequences.

**Unit3: Climate Change Adaptation**

**7Hrs**

key definitions and some of the expected consequences of climate change on key sectors.-framework for assessing climate vulnerability. -different adaptation measures

that can be implemented for various vulnerable sectors- a short introduction to linkages between climate change adaptation and development- important international adaptation initiatives and programmes.

#### **Unit 4: Climate Change Mitigation**

**5hrs**

Key definitions of mitigation and an overview of emissions levels and mitigation targets per country.-ways to integrate mitigation into development planning, through low-emission development strategies. -the main economic sectors where mitigation actions can be applied.-some of the key international mechanisms created to assist countries in planning and implementing mitigation actions.

#### **Unit 5: Planning for Climate Change**

**7Hrs**

overview of different dimensions and entry points for climate change planning.- the roles of national and sectoral, as well as sub-national institutions in climate change planning- five-step methodology for preparing a low-emission climate- resilient development strategy- some of the main international initiatives to support climate change planning.

#### **Book for study**

1 Introduction to climate change:lecture notes for Meteorologists: Prepared byDavid D. Houghton

#### **References:**

1. An Introduction to Atmospheric Physics : D.G. Andrews
2. Descriptive Physical Oceanography : G Dietrich
3. The Physics of Atmospheres : John Houghton
4. The Discovery of Global Warming : Spencer R Weart
5. Storms Of My Grandchildren : James Hansen
6. Evaluating Climate Change Action for SustainableDevelopment: Juha I. Uitto, JyotsnaPuri, Rob D. van den Berg

**MARKS INCLUDING CHOICE:**

| <b>Unit</b> | <b>Marks</b> |
|-------------|--------------|
| I           | 8            |
| II          | 4            |
| III         | 6            |
| IV          | 4            |
| V           | 8            |

**PATTERN OF QUESTIONS**

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (6 questions x Marks 2 each =12) |
|                                                                                                                                           | Answer any 6 questions | (4questions x Marks 2 each=8)    |
| <b>Part C</b>                                                                                                                             | <b>Essay</b>           | (2questions x Marks 6 each =12)  |
|                                                                                                                                           | Answer any 4 questions | ( 1question x Marks 6 each=6)    |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -30</b></li><li>• <b>Maximum marks of the course-20</b></li></ul> |                        |                                  |

## 5D02PHY RENEWABLE ENERGY SOURCES

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5 D 02 PHY  | 2                 | 2      | 2           |

### COURSE OUTCOME

**CO 1: Understand the sources of renewable energy**

**CO2: Understand the solar energy measurements & its applications**

**CO3: Understand the wind energy production & applications**

**CO4: Identify the energy from biomass, geothermal & ocean**

#### **Unit I Introduction**

**2hrs**

Renewable energy sources- prospects of renewable energy sources

[Book I 1.1,1.5,1.6]

#### **Unit II Solar energy**

**12hrs**

Solar constant –solar radiation measurements- physical principles of conversion of solar radiation into heat-solar energy storage system-solar pond-solar water heating-solar thermal electric conversion- solar photo voltaic-solar distillation-solar pumping-solar furnace-solar cooking-solar green houses-solar production of hydrogen

[Book I 2.2,2.5,3.2,4.2,4.3,5.2,5.5,5.8-5.13]

#### **Unit III Wind energy**

**10hrs**

Introduction-basic principles of wind energy conversion-site selection considerations-Basic component of WEC energy conversion systems-Classification of WEC systems-wind energy collectors –energy storage & application of wind energy

[ Book I 6.1-6.2,6.4,6.5-6.6,6.8.6.12-6.13]

#### **Unit IV Biomass energy ,geothermal energy & energy from oceans**

**8hrs**

Biomass conversion technologies-photosynthesis & biogas generation.-geothermal energy-geothermal sources-hydrothermal geopressured resources-operational & environmental problems-geothermal energy in india-ocean thermal energy conversion

[Book I 7.1-7.4,8.1,8.4-8.6,8.17-8.18,9.1-9.2]

#### **Books for Study:**

1.Non-conventional energy resources-G D Rai

**Books for Reference:**

1.Solar energy fundamentals & application-H.PGarg

2. Solar energy-G D Rai

**MARKS INCLUDING CHOICE:**

| Unit | Marks |
|------|-------|
| I    | 2     |
| II   | 14    |
| III  | 8     |
| IV   | 6     |

**PATTERN OF QUESTIONS**

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (6 questions x Marks 2 each =12) |
|                                                                                                                                           | Answer any 6 questions | (4questions x Marks 2 each=8)    |
| <b>Part C</b>                                                                                                                             | <b>Essay</b>           | (2questions x Marks 6 each =12   |
|                                                                                                                                           | Answer any 4 questions | ( 1question x Marks 6 each=6)    |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -30</b></li><li>• <b>Maximum marks of the course-20</b></li></ul> |                        |                                  |



## 5 D 03 PHY: BIOPHYSICS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5 D 03 PHY  | 2              | 2      | 2        |

### COURSE OUTCOME

**CO1: Understand the application of Physics in Biology and Medical fields**

**CO2: Understand the principles behind the movement of snakes, swimming of fishes and flying of birds**

**CO3: Understand about bioelectricity**

**CO4: Understand the principles behind EEG and ECG**

**CO5: Understand the sources of radiation and effects of radiation**

**CO6: Understand the basic principles of radiation protection and apply it in daily life.**

#### **Unit1 Bio-mechanics**

**12 Hrs**

Types of muscles- striated, cardiac, tonic muscles, properties of muscles-Excitability – conductivity-contractibility – extensibility – tonicity – structure of striated muscles – Newton’s laws – centre of mass – Bio-mechanical analysis of movements of snakes – swimming of fishes – aerodynamic basis of flights (Book-1 Chapter 12 )

#### **Unit II Bio – medical instrumentation**

**8Hrs,**

Electrical Methods to study the brain activity- Electroencephalography (EEG) - Electrocardiography (ECG) (Book 2 Chapter 4))

#### **Unit III Radiological Health and Safety**

**12 Hrs**

Sources of Radiation – Natural Background exposure – Medical exposures – Consumer products – Occupational exposure – Biological effects of radiation – Deterministic

Effects – Stochastic effects – Acute radiation syndrome – Radiation risk- Principles of radiation protection – Effect of time ,distance and shielding (Book 4 Chapter 13)

**Books for study**

- 1 Introduction to Bio-Physics by Pranab Kumar Banerjee (S Chand)
- 2 Medical Bio- Physics by R N Roy – (Books and allied (P) Ltd)
- 3 The Physics of Radiology and Imaging – K Thayalan (JAYPEE Jaypee Brothers Medical Publishers (P) Ltd)

**MARKS INCLUDING CHOICE:**

| Unit | Marks |
|------|-------|
| I    | 10    |
| II   | 9     |
| II   | 11    |

**PATTERN OF QUESTIONS**

|                                                                                                                                              |                        |                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                                | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                              | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                                | <b>Short Essay</b>     | (6 questions x Marks 2 each =12) |
|                                                                                                                                              | Answer any 6 questions | (4questions x Marks 2 each=8)    |
| <b>Part C</b>                                                                                                                                | <b>Essay</b>           | (2questions x Marks 6 each =12)  |
|                                                                                                                                              | Answer any 4 questions | ( 1question x Marks 6 each=6)    |
| <ul style="list-style-type: none"> <li>• <b>Total marks including choice -30</b></li> <li>• <b>Maximum marks of the course-20</b></li> </ul> |                        |                                  |

## 5 D 04 PHY:JOY OF STAR WATCHING

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5 D 04 PHY  | 2                 | 2      | 2           |

### COURSE OUTCOME

**CO 1: Understand Our Universe and its origin**

**CO2: Understand simple constellations**

**CO3: Explain the stars in Kerala culture**

**CO4: Understand the techniques of star watching**

**Unit I: Astrophysics**

**12Hrs**

The study of the Universe - Problems and prospects. The Universe - its origin-  
\_Galaxies\_\_Milkyway. A star is born. The death of a star. The comets—The pole star

**(Book 1)**

**Unit II: The constellations**

**2 Hrs**

Orion- Canis major-Taurus—Leo

**(Book 2)**

**Unit III Stars in Kerala culture**

**10Hrs**

The origin and expansion of Astrology -Stars and constellations in Kerala culture-

**(Book 2)**

**Unit IV: Star watching**

**8 Hrs**

How to experience star watching — For a better view

**(Book 2)**

**Books for study:**

1. The Great Universe- G.K.Sasidharan- S.Chand
2. Joy of star watching – BimanBasu- National Book Trust , India.

**Book for reference:**

1. Jyothishavum Jyothisasthravum- K. Pappooty-K.S.S.P

### MARKS INCLUDING CHOICE:

| Unit | Marks |
|------|-------|
| I    | 8     |
| II   | 5     |
| III  | 8     |
| IV   | 9     |

### PATTERN OF QUESTIONS

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (6 questions x Marks 2 each =12) |
|                                                                                                                                           | Answer any 6 questions | (4questions x Marks 2 each=8)    |
| <b>Part C</b>                                                                                                                             | <b>Essay</b>           | (2questions x Marks 6 each =12   |
|                                                                                                                                           | Answer any 4 questions | ( 1question x Marks 6 each=6)    |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -30</b></li><li>• <b>Maximum marks of the course-20</b></li></ul> |                        |                                  |

## 5 D05PHY : ELECTRICITY IN DAILY LIFE

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|----------------|--------|----------|
| V        | 5 D05PHY    | 2              | 2      | 2        |

### COURSE OUTCOME

**CO 1: Understand the sources of Electricity**

**CO2: Explain the production of Electricity**

**CO3: Understand the basic concepts of electricity auditing**

#### Unit I

**12Hrs**

What is Electricity-Different sources of electricity- non conventional and conventional sources

#### Unit II

**12Hrs**

Methods to produce electricity - How electricity is generated and transmitted- Uses and misuses of electricity -Methods of electricity conservations-How to save electricity

#### Unit III

**8Hrs**

Electricity Auditing

#### Books for reference

Hand books on Electricity conservation and Electricity auditing by EMC of Govt of Kerala

### MARKS INCLUDING CHOICE:

| Unit | Marks |
|------|-------|
| I    | 10    |
| II   | 10    |
| III  | 10    |

### PATTERN OF QUESTIONS

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (6 questions x Marks 2 each =12) |
|                                                                                                                                           | Answer any 6 questions | (4questions x Marks 2 each=8)    |
| <b>Part C</b>                                                                                                                             | <b>Essay</b>           | (2questions x Marks 6 each =12)  |
|                                                                                                                                           | Answer any 4 questions | ( 1question x Marks 6 each=6)    |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -30</b></li><li>• <b>Maximum marks of the course-20</b></li></ul> |                        |                                  |

## 5 D06PHY :INTRODUCTION TO BASIC ELECTRONICS

| SEMESTER | COURSE CODE | HOURS<br>PER WEEK | CREDIT | EXAM<br>HRS |
|----------|-------------|-------------------|--------|-------------|
| V        | 5 D06PHY    | 2                 | 2      | 2           |

**CO 1: Understand the concepts of Basic electronics.**

**CO2: Explain the Semiconductor diode**

**CO3: Understand the basic electronic measurements and the instruments.**

**Unit I: Introduction to Electronics & Passive components** **12 Hrs.**

Evolution and impact of electronics, Passive components, Resistors – specifications, colour coding, preferred values, types; Capacitors – action, specifications, colour coding, reactance and q factor, classification; Inductors - self inductance and mutual inductance, specifications, reactance and q factor, comparison of inductors and capacitors, classification; Transformers - transformer efficiency, classification; Electromechanical components.

**(Book 1, Chapters 0 & 1)**

**Unit II: Semiconductor Diodes** **10 Hrs.**

Energy band diagram, Intrinsic semiconductors, Extrinsic semiconductors, PN junction diode, Breakdown diodes, Varactor diode, Photodiode, Light dependent resistor, Solar cell, Light emitting diode.

**(Book 1, Chapter 2)**

**Unit III: Electronic Measurements and Measuring Instruments** **10 Hrs.**

Generalized measurement system, Performance and parameters of instruments, Principle of permanent magnet moving coil meter, Galvanometer as ammeter, voltmeter and ohmmeter, Multimeter, Electronic multimeters, Testing of electronic components.

**(Book 1, Chapter 6)**

### **Books for Study:**

1. Introduction to Electronics Engineering - 5th Edition, Dr. K. Gopakumar (Phasor Books)

### **Books for Reference:**

1. Principles of Electronics - V K Mehta (S Chand & Co.)
2. Basic Electronics – B L Theraja (S Chand & Co.)

3. Basic Electronics – J B Gupta (S K Kataria& Sons)

**MARKS INCLUDING CHOICE**

| Unit | Marks |
|------|-------|
| I    | 12    |
| II   | 9     |
| III  | 9     |

**PATTERN OF QUESTIONS**

|                                                                                                                                           |                        |                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>Part A</b>                                                                                                                             | <b>Short answer</b>    | (6 questions x Mark 1 = 6)       |
|                                                                                                                                           | Answer all questions   | (6 questions x Mark 1 = 6)       |
| <b>Part B</b>                                                                                                                             | <b>Short Essay</b>     | (6 questions x Marks 2 each =12) |
|                                                                                                                                           | Answer any 6 questions | (4questions x Marks 2 each=8)    |
| <b>Part C</b>                                                                                                                             | <b>Essay</b>           | (2questions x Marks 6 each =12)  |
|                                                                                                                                           | Answer any 4 questions | ( 1question x Marks 6 each=6)    |
| <ul style="list-style-type: none"><li>• <b>Total marks including choice -30</b></li><li>• <b>Maximum marks of the course-20</b></li></ul> |                        |                                  |



**MODEL QUESTION PAPERS –UG (PHYSICS)**

**.I Sem Core**

**.I Sem Complementary**

**MODEL QUESTION PAPER**  
**FIRST SEMESTER BSC DEGREE EXAMINATION**  
**PHYSICS CORE COURSE**  
**1B01PHY-MECHANICS I**

Time : 3hrs

Max Marks: 40

**PART A**

**(All questions are compulsory. Each question carry 1 mark)**

1. What do you mean by contact forces?
2. The dimensional formula of gravitational field is.....
3. The differential equation for simple harmonic motion is.....
4. State law of conservation of linear momentum
5. The value of escape velocity from earth is .....
6. Write the equation of motion for a simple pendulum

**( 6X1 = 6Marks)**

**PART B**

**(Answer any 6. Each question carries 2 marks)**

Explain inertial system with reference to Newton's first law of motion

7. State and explain Newton's law of gravitation
8. Obtain an expression for fractional change in acceleration due to gravity with altitude
9. State and explain work energy theorem
10. What are conservative forces? Give examples
11. Sketch and explain the energy diagram of a two atom system
12. Show that angular momentum is conserved for a particle in central force motion
13. State and prove parallel axis theorem

**(6X2 = 12 Marks)**

**PART C**

**(Answer any 4. Each question carries 3 marks)**

14. A Drum Major's Baton consists of two masses  $m_1$  and  $m_2$  separated by a thin rod of length  $l$ . the baton is thrown into air. Find the centre of mass and equation of motion for centre of mass of the baton
15. A 5kg mass moves under the influence of a force  $F=(4t^2\mathbf{i}- 3t\mathbf{j})\text{N}$ . It starts from the origin at  $t=0$ . Find its velocity and position at  $t=1\text{s}$

16. A proton makes a head on collision with an unknown particle at rest. The proton rebounds straight back with  $\frac{4}{9}$  of its initial kinetic energy. Find the ratio of mass of unknown particle to that of proton assuming the collision to be elastic.
17. A mass 50kg is shot vertically upward from the surface of earth with 500m/s. assuming that the only force is gravity, determine its maximum altitude assuming the value of radius of earth
18. Show that the acceleration of the masses  $m_1$  and  $m_2$  suspended over a pulley of mass  $m_p$  in an Atwood's machine is  $a = \frac{(m_1 - m_2)g}{(m_1 + m_2 + m_p/2)}$
19. A uniform drum of radius  $b$  and mass  $M$  rolls down a plane inclined at an angle  $\theta$ . Find its acceleration along the plane. The moment of inertia of the drum about its axis is  $I_0 = Mb^2/2$

**(4x3=12 Marks)**

### **PART D**

**(Answer any 2. Each question carries 5 marks)**

20. State Newton's laws of motion. Apply them to find the force on each car of mass  $M$  in a string of three freight cars pulled with force  $F$  by a locomotive
21. Define potential energy. Obtain potential energies of a uniform force field and an inverse square force
22. Distinguish between elastic and inelastic collision. Discuss elastic collision between two particles in centre of mass system and show that their speeds remain same before and after collision
23. State the law of conservation of angular momentum. Prove that the angular momentum of a rigid body is equal to the sum of the angular momentum about the centre of mass and the angular momentum of the centre of mass about the origin

**(2X5 = 10 Marks)**

**MODEL QUESTION PAPER**  
**FIRST SEMESTER BSC DEGREE EXAMINATION**  
**PHYSICS COMPLEMENTARY ELECTIVE COURSE**  
**1C01PHY: MECHANICS**

**Time: 3 Hrs**

**Max Marks: 32**

**SECTION A**

**(Answer all questions, each carries 1 Mark)**

1. What are the limiting values of Poisson's ratio?
2. If the radius of tube is doubled, the rate of flow increases by.....
3. The radius of gyration of sphere about an axis passing through the tangent.....
4. The basic solution form of simple harmonic oscillator.....
5. The velocity of sound in air is.....

( 5X1 = 5Marks)

**SECTION B**

**(Answer any four questions, each carries 2 Marks)**

6. Steel is more elastic than rubber. Explain why?
7. Why should the lubricant oil be of high viscosity?
8. How does soap help us to remove dirt better in washing clothes?
9. State and prove the parallel axes theorem
10. Write the differential equation for a forced harmonic oscillator.
11. Discuss the various modes of vibration in case of an open-end pipe.

(4X2 = 8 Marks)

**SECTION C**

**(Answer any three questions, each carries 3 Marks)**

12. Find the amount of work done in twisting a steel wire of radius 1mm and length 20cm through an angle of  $45^\circ$ . The rigidity modulus of the material of the wire is  $8 \times 10^{10} \text{ Nm}^{-2}$
13. Calculate the height to which water at  $4^\circ\text{C}$  will rise in a capillary tube of 1 mm diameter. The surface tension of water is given  $0.072 \text{ Nm}^{-1}$ .
14. A uniform thin bar of mass 3 kg and length 1.2m is bent to make an equilateral triangle. Calculate the moment of inertia about an axis passing through the centre of mass and perpendicular to the plane of the triangle.

15. Find whether the discharging of a capacitor through inductive circuit is oscillatory, given  $C = 0.2 \mu\text{F}$ ,  $L = 10\text{mH}$  and  $R = 200 \Omega$ .
16. A wire of length  $1.5\text{m}$  is stretched by force of  $44\text{N}$ . The diameter of the wire is  $2\text{mm}$  and its density is  $1.4 \text{g/cm}^{-3}$ . Calculate the frequency of fundamental note.  
( $3 \times 3 = 9$  Marks)

### SECTION D

(Answer any two questions, each carries 5 Marks)

17. What do you mean by bending moment? Obtain the expression for the bending moment of a beam.
18. Derive an expression for moment of inertia of a solid sphere about the diameter.
19. Discuss the theory of damped harmonic oscillator.
20. Derive an expression for the velocity of a longitudinal wave in gases. Discuss the Laplace's correction to Newton's formula.

( $2 \times 5 = 10$  Marks)



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