SRI Y.N.COLLEGE

(Autonomous)

Affiliated to Adikavi Nannaya University, Rajamahendravaram

Accredited by NAAC with 'A+' Grade (IV Cycle)

Dr. C.S RAO PG CENTRE

DEPARTMENT OF COMPUTER SCIENCE

(Estd. 1993)

BCA: BACHELOR OF COMPUTER APPLICATIONS

A Four Year Honours Programme Approved by APSCHE

SYLLABUS

BCA I, II & III Years

(For the Academic Year 2024-25)

SRI Y.N.COLLEGE (AUTONOMOUS), NARSAPUR

(Affiliated to Adikavi Nannaya University)
Accredited by NAAC with 'A+' Grade (IV Cycle)

Department of Computer Science
BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

PROGRAMME OUTCOMES:

At the end of the three year BCA Programme the students will be able to:

- Understand, analyze and develop computer programs in the areas related to algorithm, web design and networking for efficient design of computer based system.
- Work in the IT sector as system engineer, software tester, junior programmer, web developer, system administrator, software developer etc.
- Apply standard software engineering practices and strategies in software project development using open source programming environment to deliver a quality of product for business success.

PROGRAMME SPECIFIC OUTCOMES:

- Equip themselves to potentially rich & employable field of computer applications.
- Pursue higher studies in the area of Computer Science/Applications.
- Take up self-employment in Indian & global software market.
- Meet the requirements of the Industrial standards.

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DEPARTMENT OF COMPUTER SCIENCE

I – Year

(w.e.f. 2023 Admitted Batch)

SEMESTER-I

S. NO	Course	Name of thesubject	Total Marks	Mid. Sem. Exam	Sem. End. Exam	Teaching Hours	Credits
1	First Language	General English	100	40	60	4	4
2	Second Language	(Tel/Hindi/San)	100	40	60	4	4
3	Major Course-1	**Major-1 :** Fundamentals of Commerce(**B.Com./BBA/BCA**)	100	40	60	3+2	4
4	Major Course-2	**Major-2:** Business Organization(**B.Com./BBA/BCA**)	100	40	60	3+2	4
5	Skills Courses	**Skill Courses:** 1.Analytical Skills	50	--	50	2	2
6		2.Communication Skills	50	--	50	2	2
7	MULTI DISCIPLINARY COURSE:	Principles of Physical Sciences	50	--	50	2	2
	Total		**550**	**160**	**390**	**24**	**22**

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DEPARTMENT OF COMPUTER SCIENCE

I – Year

(w.e.f. 2023 Admitted Batch)

SEMESTER-II

S. NO	Course	Name of the subject	Total Marks	Mid. Sem. Exam	Sem. End. Exam	Teaching Hours	Credits
1	First Language	General English	100	40	60	4	4
2	Second Language	(Tel/Hindi/San)	100	40	60	4	4
3	Major Course-3	**Major-3:** Office Automation Tools	100	40	60	3	3
		Office Automation Tools Lab	50	-	50	2	1
4	Major Course-4	**Major-4:** Programming in C	100	40	60	3	3
		Programming in C Lab	50	-	50	2	1
5	**Minor-1**	**Business Management:** Principles of Management	100	40	60	5	4
6	Skills Courses	1. Business Writing	50	-	50	2	2
		2. Digital Literacy	50	-	50	2	2
7	**Certificate / Value Added Course**	**HVPE(BBA/BCA)**	50	-	50	2	2
8		Two Months Social Immersion Internship	100				
	Total		**850**	**200**	**550**	**30**	**26**

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-III

(w.e.f. 2023-24 Admitted Batch)

S. NO	Course	Name of the subject	Total Marks	Mid. Sem. Exam	Sem. End. Exam	Teaching Hours	Credits
1	Major Course-5	**Major-5:** Data Base Management System	100	40	60	3	3
		Data Base Management System Lab	50	-	50	2	1
2	Major Course -6	**Major-6:** Data Structures	100	40	60	3	3
		Data Structures Lab	50	-	50	2	1
3	Major Course -7	**Major-7:** Object Oriented Programming through Java	100	40	60	3	3
		Object Oriented Programming through Java Lab	50	-	50	2	1
4	Major Course -8	**Major-8:** Software Engineering	100	40	60	3	3
		Software Engineering Lab	50	-	50	2	1
5	**Minor-2**	**Organization Behavior**	100	40	60	5	4
6	Skill Courses	Information and Communication Technology (ICT)	50	----	50	2	2
7	Multi Disciplinary Course	Health and Hygiene	50	-----	50	2	2
	Total		800	200	600	29	24

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

S. NO	Course	Name of thesubject	Total Marks	Mid. Sem. Exam	Sem. End. Exam	Teaching Hours	Credits
1	Major Course-9	**Major-9:** Python Programming	100	40	60	3	3
		Python Programming Lab	50	-	50	2	1
2	Major Course -10	**Major-10:** Operating Systems	100	40	60	3	3
		Operating Systems Lab	50	-	50	2	1
3	Major Course -11	**Major-11:** Mobile Application Development using Android	100	40	60	3	3
		Mobile Application Development using Android Lab	50	-	50	2	1
4	**Minor-3**	**Marketing Management**	100	40	60	5	4
5	**Minor-4**	**Human Resource Management**	100	40	60	5	4
6	Skill Course	Tourism Guidance	50	-	50	2	2
7	MULTI DISCIPLINARY COURSE	Introduction to Nanotechnology	50	-	50	2	2
	Total		**750**	**200**	**550**	**29**	**24**

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DEPARTMENT OF COMPUTER SCIENCE

III – Year Semester -V

(w.e.f. 2021 Admitted Batch)

Skill Enhancement Courses (SECs) for Semester -V

S. No	Paper Code	Subject	Hours per week	Credits	Max. Marks		Total Marks
					Internal	External (University Exams)	
1	SEC-1	Machine Learning Using Python	3	3	25	75	100
	SEC-1P(Lab)	Python Lab	2	1	--	50	50
2	SEC-2	Digital Imaging	3	3	25	75	100
	SEC-2P(Lab)	Digital Imaging Lab	2	1	--	50	50
3	SEC-3	Cyber Security and Malware Analysis	3	3	25	75	100
	SEC-3P(Lab)	Cyber Security and Malware Analysis Lab	2	1	--	50	50
4	SEC-4	Internet of Things	3	3	25	75	100
	SEC-4P(Lab)	Internet of Things Lab	2	1	--	50	50
5	SEC-5	Mobile Application Development	3	3	25	75	100
	SEC-5P(Lab)	Mobile Application Development Lab	2	1	--	50	50
6	SEC-6	PC Hardware And Networking	3	3	25	75	100
	SEC-6P(Lab)	PC Hardware And Networking Labs	2	1	--	50	50
TOTAL			**30**	**24**	**150**	**750**	900

Note: *Course type code: T: Theory, L: Lab, P: Problem solving

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DEPARTMENT OF COMPUTER SCIENCE

B.Com./B.B.A/B.C.A I – Year

(w.e.f. 2023 Admitted Batch)

Semester-I

MAJOR COURSE-1: FUNDAMENTALS OF COMMERCE

Learning Objectives:

The objective of this paper is to help students to acquire conceptual knowledge of the Commerce, Economy and Role of Commerce in Economic Development. To acquire Knowledge on Accounting and Taxation.

Learning Outcomes:

At the end of the course, the student will able to Identify the role commerce in Economic Development and Societal Development. Equip with the knowledge of imports and exports and Balance of Payments. Develop the skill of accounting and accounting principles. They acquire knowledge on micro and micro economics and factors determine demand and supply. An idea of Indian Tax system and various taxes levied on in India. They will acquire skills on web design and digital marketing.

Unit-I Introduction:

Definition of Commerce - Importance of Commerce - Role of Commerce in Economic development - Role of Commerce is Societal development - Imports and Exports - Balance of Payments - Functions of World Trade Organisation

Unit-II Accounting Principles:

Need for Accounting - Definition, Objectives and advantages of Accounting - Book Branches of Keeping and Accounting Accounting concepts and Conventions Classification of Accounts - GAAP - Accounting Double entry book keeping Preparation of Journal - Posting to Ledger - Meaning of Subsidiary books - Preparation of Cash book - Three Columned cash book (IncludingProblems). -

Unit-III Trial Balance and Final Accounts:

Objectives of Trial Balance - Preparation of Trial Balance Methods Capital and Revenue-Preparation of Final Accounts - Trading Account - Profit and Loss Account - Balance Sheet(Including Problems). -

Unit- IV Economic Theory:

Meaning and Definition of Economics - Micro and Macro Economics Demand and Supply Determinants of Demand - Law of Demand Definition of National Income - Concepts of National Income National Income Meaning of Meaning and Measurement of

Unit - V Taxation:

Meaning of Tax - Types of tax - Income Tax, Corporate Tax, GST, Customs duty and Excise Duty - Differences between Direct and Indirect Taxes Objectives of Tax Concerned Authorities - Central Board of Direct Taxes (CBDT) and Central Board of Excise and Customs (CBIC).

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DEPARTMENT OF COMPUTER SCIENCE

B.Com./B.B.A/B.C.A I – Year

(w.e.f. 2023 Admitted Batch)

Semester-I

MAJOR COURSE-1: FUNDAMENTALS OF COMMERCE: Model Paper

Time: 3 hours **Max. Marks: 60**

PART-I

5X4=20M

Answer any **FIVE** of the following.

1. Define Commerce.
2. What is Double entry system.
3. Explain the Rules of Debit and Credit.
4. Explain the objectives of preparing the trail balance.
5. Write about Micro Economics.
6. What is meant by National Income?5t6
7. Write about Income Tax.
8. CBDT

PART-II

Answer any **FIVE** of the following by selecting at least **TWO** from each section **5X8=40M**

SECTION-A

9. Prepare a Three Column Cash Book from the following.

Jan	1	Cash balance	15000
"		Bank balance	50000
"	2.	Cash sales	40000
"	5.	Furniture purchased and issued cheque	8000
"	6.	Rent paid by the cheque	5000
	7.	Cash deposited in the bank	40000
"	8.	Received interest on Investment	4000
"	9.	Paid salaries	5000
"	10.	Received from Vishnu	15000
		Discount allowed	500
"	14.	Goods purchased from Gopi for cash	6000
"	18.	Cash withdrawn from bank for office use	12000
"	20.	Cheque issued to Raja	5800
		Discount Received	200
"	24.	Cash withdrawn from bank personal use	4000

10. Trail Balance Problem.

	Rs.		Rs.
Cash	85,600	Creditors	6,000
Capital	1,00,000	Discovered received	200
Purchases	40,000	Discount allowed	500
Sales	35,000	Advertisement	700
Salaries	5,000	Interest received	500
Furniture	800	Drawings	1,000
Stationery	300		
Bank	7,800		

11. Describe the Role of Commerce in Economic Development.
12. Explain determinants of Demand
13. Distinguish between Book Keeping and Accounting.

SECTION-B

14. Journalize the following transactions 2019,
Jan 1. Mohan started Business with cash Rs.2,50,000"
2. Purchased goods R.50,000.
" 4. Deposited cash into Bank Rs.20,000
" 5. Cash sales Rs. 30,000.
" 7. Bought goods from Pavan Rs.5,000.
" 10. Purchased furniture from Gupta and Co. Rs. 6,000.
" 15. Drawings Rs.3,000.
" 20. Drew from Bank for office use Rs.5,000.
" 25. Received commission Rs. 2,000.
" 31. Paid salaries by cheque Rs.10,000.

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15. The following are the extracted from the books of Krishna Murthy on 30-09- 2019.Prepare Trading & Profit and loss A/c and Balance sheet.

Particulars	Debit (Rs.)	Credit(Rs.)
Capital		50000
Plant and Machinery	20000	
Furniture	11500	
Sundry debtors and creditors	15000	20000
Bills Receivable and Payable	10000	5000
Opening Stock	20000	
Purchases and Sales	60000	90000
Depreciation	1200	
Outstanding salaries		800
Salaries	10000	
Wages	22000	
Insurance	1000	
Prepaid Insurance	100	
Carriage	400	
10% Loan		5400
	17120	**171200**

Adjustments:

1. Write off Rs.1000 as bad debts
2. Closing stock was valued at Rs.40000
3. Allow 10% interest on capital.

16. Describe the Concept of National Income.
17. Explain the Advantages of Accounting.
18. Discuss the objectives of Tax.

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DEPARTMENT OF COMPUTER SCIENCE

B.Com./B.B.A/B.C.A I – Year

(w.e.f. 2023 Admitted Batch)

Semester-I

MAJOR COURSE-2: BUSINESS ORGANSATION

Learning Objectives:

The course aims to acquire conceptual knowledge of business, formation various business organizations.

To provide the knowledge on deciding plant location, plant layout and business combinations.

Learning outcomes:

After completing this course a student will able to:

Understand the concept of Business Organization along with the basic laws and forms ofBusiness Organization.

The ability to understand the terminologies associated with the field of Business Organization along with their relevance and to identify the appropriate types and functioning of Business Organization for solving different problems.

The application of Business Organization principles to solve business and industry related problems and to understand the concept of Sole Proprietorship, Partnership and Joint Stock Company etc.

Unit-I Business:

Business concepts, Features of Business, Importance of business, Classification of Business activities, Characteristics and objectives of Business organisation, Differences between Industry and Commerce and Business & Profession, Modern Business and their Characteristics.

Unit - II Promotion of Business:

Forms of Business organisation - Sole proprietorship, Partnership, Joint Stock Companies and Co-operatives and their features, advantages, Differences between Private Ltd. and Public Ltd. Company, Concept of one person Company, Qualities of a successful Business man.

Unit - III Plant Location and Layout:

Importance of Plant Location, Factors affecting Plant Location, Plant Layout - Importance, Types of Layout, Factors affecting Layout, Size of Business Unit - Criteria for Measuring the size and Factors affecting the Size, Optimum Size and Factors determining the Optimum Size.

Unit - IV Business Combination:

Business Combination - Characteristics, Causes, Kinds of Business Combination. Rationalization - Meaning, Characteristics, Principles, Merits and demerits, Differences between Rationalisation and Nationalisation.

Unit - V Computer Essentials:

Computer Evolution: Computer History and Generations, Block Diagram of Computer. Internet Basics - Network, Types of Networks, Internet history, Internet Service Providers, Domain Name Services, Network Security Concepts - Cryptography, Malware, Firewalls. Web Design - Word Press Basics, Developing a Simple Website.

Reference Books:

1. Gupta, C.B., "Business Organisation", Mayur Publiction, (2014).
2. Singh, B.P., Chhabra, T.N., "An Introduction to Business Organisation & Management",Kitab Mahal, (2014).
3. Sherlekar, S.A. & Sherlekar, V.S, "Modern Business Organization & Management Systems Approach Mumbai", Himalaya Publishing House, (2000).
4. Bhusan Y. K., "Business Organization", Sultan Chand & Sons.
5. Prakash, Jagdish, "Business Organistaton and Management", Kitab Mahal Publishers (Hindiand English)
6. Fundamentals of Computers by V. Raja Raman
7. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson

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DEPARTMENT OF COMPUTER SCIENCE

B.Com./B.B.A/B.C.A I – Year

(w.e.f. 2023 Admitted Batch)

Semester-I

BUSINESS ORGANSATION: Model Paper

Time: 3 hours **Max. Marks: 60M**

PART - I

Answer any FIVE questions from the following. **5X4=20M**

1. Explain the Concept of Business.
2. Explain the Objectives of Business Organisation
3. Explain the Features of sole proprietorship.
4. Concept of one person Company.
5. Write the Importance of Plant Location
6. Explain the Characteristics of Rationalisation.
7. Define Computer.
8. Explain about Firewall.

PART – II

Answer any **FIVE** of the following by selecting at least **TWO** from each Section **5X8=40M**

SECTION-A

9. Define Business and explain various features of Business?
10. Discuss the advantages of Joint Stock Company.
11. Explain the Types of Plant Layout.
12. Explain the causes of Business Combination
13. Explain about Block Diagram.

SECTION-B

14. Write the differences between Industry and Commerce.
15. Differences between Private limited company and public limited company.
16. Discuss about factors determing the optimum size of Business unit.
17. Merits and Demerits of Rationalisation.
18. Write about Types of Networks.

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DEPARTMENT OF COMPUTER SCIENCE

I – YEAR SEMESTER-II

(w.e.f. 2023 Admitted Batch)

SEMESTER-II

S. NO	Course	Name of the subject	Total Marks	Mid. Sem. Exam	Sem. End. Exam	Teaching Hours	Credits
1	First Language	General English	100	40	60	4	4
2	Second Language	(Tel/Hindi/San)	100	40	60	4	4
3	Major	Office Automation Tools	100	40	60	3	3
		Office Automation Tools Lab	50	-	50	2	1
4	Major	Programming in C	100	40	60	3	3
		Programming in C Lab	50	-	50	2	1
5	Minor	**Business Management:** Principles of Management	100	40	60	5	4
6	Skills Courses	3. Business Writing	50	-	50	2	2
		4. Digital Literacy	50	-	50	2	2
7	**Certificate / Value Added Course: HVPE(BBA/BCA)**		50	-	50	2	2
8		Two Months Social Immersion Internship	100				
	Total		**850**	**200**	**550**	30	26

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DEPARTMENT OF COMPUTER SCIENCE

I – YEAR SEMESTER-II
(w.e.f. 2023 Admitted Batch)

COURSE 3: OFFICE AUTOMATION TOOLS
For BCA Major / BBA Minor

Theory | Credits: 3 | 3hrs/week

Course Objectives:

- ✓ To introduce the environment of GUI in Ms-Word and its features..
- ✓ To introduce the fundamental concepts using Ms-Word and its features to make it more useful.
- ✓ To provide hands-on use of Word, Excel and PowerPoint.

Course Outcomes:

The students will be able:

- ✓ To understand concept of Word Processor and use its features.
- ✓ To use the advanced features of Ms-Word to make day to day usage easier.
- ✓ To work comfortably with Ms-Excel Environment.
- ✓ To Create worksheets and use advanced features of Excel.
- ✓ To create presentations and inserting multimedia items in them.

UNIT–I : Introduction to Ms-Office &Ms-Word:

MS-Word: Features of MS-Word, MS-Word Window components, working with formatted text, Shortcut keys, Formatting documents: Selecting text, Copying &moving data, Formatting characters, changing cases, Paragraph formatting, Indents, Drop Caps, Using format painter, Page formatting, Header &footer, Bullets & numbering, Tabs, Forming tables. Finding & replacing text, go to (F5) command, proofingtext (Spellcheck, Auto correct.

UNIT–II : Ms-Word Advanced Features:

Difference between Wizard and Template - Customize the Quick Access Tool Bar – Macros: Purpose – Creating Macro – Using Macro – Storing Macro - Inserting pictures: From Computer, Online Pictures – Insert 3d Models - Insert Shapes – Insert Text Box – Insert Equation, Hyperlinks- Tables : Insert tables - Mail merge ,Printing documents, Tables : Insert tables, Mathematical calculations on tables data. InsertText Box etc.

UNIT–III: Introduction to Ms-Excel & Its Features:

MS-Excel: Excel Features, Spread sheets, workbooks, creating, saving &editing a workbook, Renaming sheet, cell entries(numbers, labels, and formulas),spell check, find and replace, Adding and deleting rows and columns Filling series, fill with drag, data sort, Formatting worksheet, Functions and its types, Some useful Functions in excel (SUM,AVERAGE,COUNT, MAX,MIN, IF)

UNIT-IV: Ms-Excel AdvancedFeatures:

Cell referencing(Relative,Absolute,Mixed),What-if analysis,

Introduction to charts: Types of charts, creation of charts, printing a chart, printing worksheet – Sort – Filters – View Menu- Goal Seek –Scenarios.

UNIT-V: Ms-PowerPoint and its Applications:

MS-PowerPoint: Features of Power Point, Uses, components of slide, templates and wizards, using template, choosing an auto layout, using outlines, adding subheadings, editing text, formatting text, using master slide, adding slides, changing color scheme, changing background and shading, adding header and footer, adding clip arts and auto shapes. Various presentation, Working with slide sorter view(deleting, duplicating, rearranging slides),adding transition and animations to slide show, inserting music or sound on a slide, viewing slideshow, Printing slides.

Text Books:

1. Computer Fundamentals–Pradeep .K.Sinha: BPB Publications.
2. Fundamentals of Computers –Reema Thareja, Oxford UniversityPress India

GUIDELINES TO THE PAPER SETTER

BLUE PRINT

Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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DEPARTMENT OF COMPUTER SCIENCE

I – YEAR SEMESTER-II
(w.e.f. 2023 Admitted Batch)

COURSE 3: OFFICE AUTOMATION TOOLS
MODEL PAPER

BCA MAJOR

Time: 3 Hours **Max.Marks:60**

PART-I

Answer any Five Questions from Section-A and Section-B taking at least two from each section. **(5 X 8 = 40M)**

SECTION – A

1. What are the features of MS-Word? Explain the Word Window Components.
2. Explain the steps to create a Letter in MS-Word with an example.
3. Explain the steps for Mail Merge in MS-Word with an example.
4. Briefly explain the concept of Macros in MS-Word.
5. Write a procedure to create Time Table in MS-Word with an example.

SECTION – B

6. Write the features of MS-Excel. Explain how to create a Workbook with an example.
7. Explain various Functions in Excel with an example.
8. Explain Cell Referencing in MS-Excel with an example.
9. Explain different types of Charts in MS-Excel.
10. What are the features of MS-PowerPoint? Explain the steps for how to create a Presentation in MS PowerPoint.

PART-II

SECTION – C

Answer any five questions from the following. **(5X4=20M)**

11. Write a short note on Formatted Text.
12. Write about Headers and Footers.
13. Write about how to insert pictures in MS-Word.
14. Write about Cell Entries in MS-Excel.
15. Write about Adding and Deleting Rows.
16. Write about What-if analysis in MS-Excel.
17. Write about Components of Slide in MS-PowerPoint.
18. Write about how to work with the Slide Sorter View in MS PowerPoint.

APPROVED

B. Anuradha.

K. Padmavathi.

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DEPARTMENT OF COMPUTER SCIENCE

I – YEAR SEMESTER-II
(w.e.f. 2023 Admitted Batch)

COURSE 3: OFFICE AUTOMATION TOOLS

For BCA Major / BBA Minor

Practical — Credits: 1 — 2 hrs/week

List of Experiments

1. Design a visiting card for managing director of a company as per the following specification.
   - Sizeofvisitingcardis3½×2
   - Name of the company with big font
   - Phone number, Fax number and E-mail address with appropriate symbols.
   - Office and Residence addresses separated by new line
2. Create a table with following columns and display the result in separate cellsfor the following
   - Emp Name, Basic pay, DA, HRA, Total salary.
   - Sort all the employees in ascending order with the name as the key
   - Calculate the total salary of the employee
   - Calculate the Grand total salary of the employee
   - Find highest salary and
   - Find lowest salary
3. Prepare an advertisement to company requiring software professional with thefollowing
   - Attractive page border
   - Design the name of the company using WordArt
   - Use at least one clipart.
   - Give details of the company(use bullets etc.)
   - Give details of the Vacancies in each category of employee's(Business manager, Software engineers, System administrators, Programmers, Data entry operators)qualification required.
4. Create a letter head of a company with the following specifications
   - Name of the company on the top of the page 2 with big font and good style
   - Phone no, Faxno and E-mail address with symbols.
   - Main products manufactured by the company
   - Slogans if any should be specified in bold at the bottom

5. Create two pages of curriculum vitae of a graduate with the following specifications
   - Table to show qualifications with proper headings
   - Appropriate left and right margins
   - Format ½pageusingtwo-columnapproachabout yourself
   - Name on each page at the top right side
   - Page no. in the footer on the right side.
6. Write a macro format document as below
   - Line spacing"2"(double)
   - Paragraphindentof0.1
   - Justification formatting style
   - Arial font andBoldof14pt-size.
7. Create a letter as the main document and create 10 records for the 10 persons Use mail merge to create letter for selected persons among 10.
8. Create an electronic spread sheet in which you enter the following decimal numbers andconvert the number to octal, Hexadecimal and binary numbers and vice-versa.

   DecimalNumbers:35,68,95,78,165,225,355,375,465

   BinaryNumbers:101,1101,11101,11111,10001,11101111
9. Calculate the net pay of the employees following the conditions below.

	A	B	C	D	E	F	G	H	I
1	Employee Number	Employee Name	Basic pay	DA	HRA	GPF	Gross Pay	Income tax	Net pay
2									

   - **DA:-** 16% of the basic pay if Basic pay is greater than 20000 or else 44%.
   - **HRA:-** 15 % of the Basic pay subject to maximum of Rs.4000.
   - **GPF:** -10% of the basic pay.
   - **INCOMETAX:-**10% of basic If Basic pay is greater than20000.

   Find who is getting highest salary & who is get lowest salary?

10. The ABC Company shows the sales of different product For5years.CreateBARGraph, 3Dand Pie chart for the following.

A	B	C	D	E	F
S.No.	Year	Pro1	Pro2	Pro3	Pro4
1	1989	1000	800	900	1000
2	1990	800	80	500	900
3	1991	1200	190	400	800
4	1992	400	200	300	1000
5	1993	1800	400	400	1200

11. Create a suitable examination database and find the sum of the marks(total) of eachstudent and respective, class secured by the student.

- ✓ **Pass** – if marks in each subject >= 35
- ✓ **Distinction**- if average >= 75
- ✓ **First class** - if average >=60 but <75
- ✓ **Second class** – if average >=50 but l<60
- ✓ **Third class** – if average >=35 but <50
- ✓ **Fail**: if marks in any subject <35

12. Enter the following data in to the sheet.

Name	Department	Salary
Anusha	Accounts	12000
Rani	Engineering	24000
Lakshmi	Accounts	9000
Purnima	Marketing	20000
Bindu	Accounts	4500
Tejaswi	Accounts	11000
Swetha	Engineering	15000
Saroja	Marketing	45000
Sunitha	Accounts	5600
Sandhya	Engineering	24000
Harika	Marketing	8000

- o Extract records for department in Accounts and Salary>10000
- o Sort the data by salary with the department using "sort commands".
- o Calculate total salary for each department using Subtotals

13. Enter the following data into the sheet.

	Raju	Rani	Mark	Rosy	Ismail	Reshma
English	76	89	43	51	76	87
2ndLang	55	85	78	61	47	33
Maths	65	82	34	58	52	65
Computers	45	91	56	72	49	56
Human Values	51	84	54	64	32	64

Apply the conditional formatting for marks

- 35 below Red
- 35 to 50 Blue
- 51 to 70 Green
- 71 to 100 Yellow

14. Create a presentation using templates.

15. Create a Custom layout or Slide Master for professional presentation.

16. Create a presentation with slide transitions and animation effects

17. Create a table in PPT and apply graphical representation unit.

APPROVED
K. padmavathi
8/8/2019

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DEPARTMENT OF COMPUTER SCIENCE

I – YEAR SEMESTER-II

(w.e.f. 2023 Admitted Batch)

COURSE 4: PROGRAMMING IN C

Theory | Credits: 3 | 3 hrs/week

Course Objectives:

- Provides knowledge on Algorithms, Flow chart and basic programming language.
- Provides complete knowledge of C language.
- Helps to develop logics which will help them to create program and applications in C.
- Learning the basic programming constructs, they can easily switch over to anyother language in future.

Course Outcomes:

Upon successful completion of this course, students will be able to-

- Understand the basic terminology used in computer programming.
- Write, compile and debug programs in C language.
- Use different data types in a computer program.
- Design programs involving decision structures, loops and functions.
- Understand the dynamics of memory by the use of pointers and Structures.
- Apply different operations in File handling.

UNIT - I: Introduction to Algorithms and Programming Languages: Algorithm - Key features of Algorithms - examples of Algorithms, Flow Charts– Pseudo code, Programming Languages – Generation of Programming Languages – Structured Programming Language. **Introduction to C:** Introduction – Structure of C Program, Writing the first C Program, File used in C Program – Compiling and Executing C Programs, Using Comments – Keywords – Identifiers, Basic Data Types in C, Variables – Constants, I/O Statements in C, Operators in C, Programming Examples, Type Conversion and Type Casting.

UNIT - II:

Control Structures and Functions: Decision Control and Looping Statements: Introduction to Decision Control Statements, Conditional Branching Statements, Iterative Statements, Nested Loops, Break and Continue Statement – Go to Statement. Functions: Introduction, Using functions – Function declaration/ prototype – Function definition, Function call – Return statement – Passing parameters, Scope of variables, Storage Classes, Recursive functions.

UNIT - III:

Arrays: Introduction, Declaration of Arrays, accessing elements of the Array – Storing Values in Array, Calculating the length of the Array, Operations that can be performed onArray, Passing one dimensional array to function.

Two dimensional Arrays, accessing two dimensional arrays, Passing two dimensional arrays to functions. **Strings:** Introduction, String Operations using String functions.

Case Study:

Searching an element in an array.Disadvantages of an array.

UNIT - IV: Pointers, Structures and Unions: Pointers: Understanding Computer Memory – Introduction to Pointers, Declaring Pointer Variable, Pointer Expressions and Pointer Arithmetic – Null Pointers, Passing Arguments to Functions using Pointer, Pointer and Arrays – Passing Array to Function, Memory Allocation in C Programs, Memory Usage – Dynamic Memory Allocation, Drawbacks of Pointers. Structures: Introduction to structures, Nested Structures. Union, and Enumerated Data Types: Introduction to Union– accessing union elements, Enumerated Data Types.

UNIT – V: File Handling: Files: Introduction to Files, Using Files in C, Reading Data from Files, Writing Data from Files, Detecting the End-of-file, Error Handling during File Operations.

PRESCRIBED TEXT BOOKS:

Computer Fundamentals and Programming in C by REEMA THAREJA from OXFORDUNIVERSITY PRESS

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K Padmavathi

BBarung

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REFERENCE BOOKS:

1. E. Balagurusamy, COMPUTING FUNDAMENTALS & CPROGRAMMING – Tata McGraw-Hill, Second Reprint 2008 ISBN 978-0-07-066909-3.
2. Ashok N Kamthane: Programming with ANSI and Turbo C, PearsonEdition Publ, 2002.
3. Henry Mullish&HuubertL.Cooper: The Sprit of C, Jaico Pub, House,1996.
4. Teach your C Skills-Kanithker

GUIDELINES TO THE PAPER SETTER

BLUE PRINT

Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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DEPARTMENT OF COMPUTER SCIENCE

I – YEAR SEMESTER-II

(w.e.f. 2023 Admitted Batch)

COURSE 4: PROGRAMMING IN C

MODEL PAPER

Time: 3 Hours | Max.Marks: 60

PART-I

Answer any Five Questions from Section-A and Section-B taking at least two from each section. **(5 X 8 = 40M)**

SECTION – A

1. Explain various built in Data Types in C.
2. Discuss the structure of a C program in detail..
3. Write about different iterative control statements in C with suitable examples.
4. Explain the Switch statement with an example.
5. Define Function. Write about Call by value and Call by reference in detail with a example.

SECTION – B

6. Define an Array. Explain about declaration and accessing elements of an array with an example.
7. Explain about different String operations in C.
8. Write about Structures and Unions in detail.
9. Explain the concept of Pointers & types of pointers.
10. Explain various file handling functions and a write a C program to read data from a text file.

PART-II

SECTION – C

Answer any five questions from the following. **(5X4=20M)**

11. Building blocks of a Flow Chart.
12. Write about Operators used in C program.
13. Break and Continue.
14. Explain calculating the length of an array with example.
15. String Functions.
16. Dynamic Memory Allocation.
17. Error Handling in Files.
18. File Operations.

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B. Daruna

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DEPARTMENT OF COMPUTER SCIENCE

I – YEAR SEMESTER-II
(w.e.f. 2023 Admitted Batch)

MAJOR COURSE 4: PROGRAMMING IN C

Practical — Credits: 1 — 2 hrs/week

List of Experiments:

1. Write a C program to calculate the expression: ((a*b)/c)+(a+b-c) .
2. Write a C program to calculate (a+b+c)3.
3. Write a C program to check whether the given number is Prime or Not.
4. Write a C program to find the sum of individual digits of a given number .
5. Program to convert Hours into seconds.
6. Write a C program to generate all the prime numbers between 1 and n, where n is avalue supplied by the user.
7. Write a program to check whether the given number is Palindrome or Not.
8. Write a C program to check whether a given 3-digit number is an Armstrong numberor not.
9. Write a C program to print the numbers in triangular form.

   1
   1 2
   1 2 3
   1 2 3 4

10. Program to display the number of daysa in given month using Switch – Case.
11. Write a C program to perform the following:
    I. Addition of two matrices.
    II. Multiplication of two matrices.
12. Write a C program to determine if the given string is a palindrome or not.
13. Write C program to find the factorial of a given integer using a recursive function.
14. Write a C program to concatenate two strings using pointers.
15. Write a C program to find the length of a string using pointers.
16. Program to display Student Details using Structures.
17. Write a C program to
    I. Write data into a File. II. Read data from a File.

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I – YEAR SEMESTER-II
(w.e.f. 2023 Admitted Batch)

Minor-1: PRINCIPLES OF MANAGEMENT

Theory | Credits: 4 | 4 hrs/week

Course Objectives

- To outline the fundamental activities of managers
- To explain the basic concepts, principles and theories of management
- To examine the broad functions of management
- To comprehend the contemporary issues and challenges in the field of management
- To understand various control techniques practised at organisations.

UNIT-I: INTRODUCTION TO MANAGEMENT:

Definition – Nature, process and significance of management . Role of managers – Managerial Skills and Roles. Schools of Management Thought , Management as a Science or Art - Management as a profession, Administration and Management Functions of Management. Contemporary Issues and Challenges in Management of 21st Century.

UNIT -II: PLANNING:

Planning - Nature and Importance of Planning, Types of Plans- Levels of Planning. Steps in planning process, Making Effective Plans. Significance of Objectives, Management by Objectives (MBO). Decision making- Nature of decision making, Types of decisions, Decision Making Process.

UNIT -III: ORGANIZING:

Organizing - Nature and purpose, Principles of Organization, Types of Organization. Organisational Structure and Design – Line, Staff and functional authority, Conflict between Line and Staff – Overcoming the Line-Staff Conflict. Committees, Departmentation. Authority, Responsibility and Accountability, Principles of Delegation , process of delegation. Span of Control, Centralization Vs. Decentralization, Factors determining the degree of Decentralization of authority.

UNIT -IV: STAFFING AND DIRECTING:

Staffing - Nature and Purpose of Staffing, Importance of staffing. Components of Staffing, Manpower planning, Recruitment and Selection. Directing – Nature of Directing function. Concept of Motivation, theories of Motivation- Maslow's theory of Need Hierarchy and Herzberg's Dual

Factor theory, Motivating people at work. Communication skills for directing, Barriers in communication.

UNIT -V: CONTROLLING:

Controlling - Concept, Nature and Importance, Essentials of Control. Requirements of an effective Control System, Techniques of Managerial control. Behavioural Implications of Control.

Reference Books:

1. Koontz, H., & Weihrich, H. Essentials of Management, McGraw Hill Publishers.
2. Gupta, R.S., Sharma, B.D., & Bhalla. N.S. Principles & Practices of Management. NewDelhi, Kalyani Publishers.
3. L M Prasad, Principles and Practices of Management, Himalaya Publishing House
4. Rao, P.S. Principles of Management, Himalaya Publishing House.

APPROVED

B Baruna.
K Padmavathi

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Minor -1: PRINCIPLES OF MANAGEMENT

Time: 3 hours **Max. Marks: 60**

PART - I

Answer any FIVE questions from the following. **5X4=20M**

1. Concept of Management.
2. Management as a Science and Art
3. Nature of Planning
4. Management By Objectives.
5. Line and Staff Concepts6.Staffing
7. Controlling
8. Barriers in Communication.

PART – II

Answer any **FIVE** of the following by selecting at least **TWO** from each Section **5X8=40M**

SECTION-A

9. Explain the Nature, process and significance of Management.
10. Discuss the Importance of Planning? Explain Types of Plans.
11. Define Organization .Explain Types of Organization.
12. Explain the Concept of Maslow's theory of Need Hierarchy.
13. Explain the process of Controlling.

SECTION-B

14. Write the Functions of Management.
15. Explain the Nature, and process of Decision Making.
16. Explain the Principles of Delegation of Authority.
17. Differentiate Recruitment and Selection.
18. Write about the Techniques of Controlling.

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DEPARTMENT OF COMPUTER SCIENCE

I – YEAR SEMESTER-II
(w.e.f. 2023 Admitted Batch)

Certificate /Value Added Course Human Values and Professional Ethics

Learning Outcomes: On completion of this course, the students will be able to

- Understand the significance of value inputs in a classroom and start applying them in their life and profession
- Distinguish between values and skills, happiness and accumulation of physical facilities, theSelf and the Body, Intention and Competence of an individual, etc.
- Understand the value of harmonious relationship based on trust and respect in their life andprofession
- Understand the role of a human being in ensuring harmony in society and nature.
- Distinguish between ethical and unethical practices, and start working out the strategy to actualizea harmonious environment wherever they work.

UNIT: 1

Introduction – Definition, Importance, Process & Classifications of Value Education: Understanding the need, basic guidelines, content and process for Value Education Understanding the thought provoking issues; need for Values in our daily life Choices making – Choosing, Cherishing & Acting, Classification of Value Education: understanding Personal Values, Social Values, Moral Values & Spiritual Values.

UNIT: 2

Harmony in the Family – Understanding Values in Human Relationships: Understanding harmony in the Family- the basic unit of human interaction, Understanding the set of proposals to verify the Harmony in the Family; Trust (Vishwas) and Respect (Samman) as the foundationalvalues of relationship, Present

Scenario: Differentiation (Disrespect) in relationships on the basis of body, physical facilities, or beliefs. Understanding the Problems faced due to differentiation in Relationships.

Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi,

Abhay, Sah-astitva as comprehensive Human Goals Visualizing a universal harmonious order in society- Undivided Society (AkhandSamaj), Universal Order (SarvabhaumVyawastha)- from family to world family-I and The Body concept.

UNIT: 3

- Professional Ethics in Education: Understanding about Professional Integrity, Respect & Equality, Privacy, Building Trusting Relationships.Understanding the concepts; Positive co- operation, Respecting the competence of other professions. Understanding about Taking initiative and Promoting the culture of openness. Depicting Loyalty towards Goals and objectives.

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DEPARTMENT OF COMPUTER SCIENCE

B.B.A/B.C.A I – Year

(w.e.f. 2023 Admitted Batch)

SEMESTER-II

Certificate / Value Added Course: Human Values and Professional Ethics

MODEL QUESTION PAPER

Time :2hrs. **Max .Marks:50**

SECTION -A

Answer any Three Questions of the following **3X10=30M**

1. What is value education? What is the need and purpose of value education?
2. Write about professional integrity
3. Explain family as a basic unit of human interaction?
4. Write about the position of RESPECT in present situation
5. What is the situation of Harmony with the society today

SECTION -B

4x5=20M

Answer any Four Questions of the following

6. Human interaction
7. Position of RESPECT in present situation
8. Professional integrity
9. Universal human order
10. Professional ethics
11. Value education

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-III

(w.e.f. 2023-24 Admitted Batch)

S. NO	Course	Name of the subject	Total Marks	Mid. Sem. Exam	Sem. End. Exam	Teaching Hours	Credits
1	Course-5	**Major-5:** Data Base Management System	100	40	60	3	3
		Data Base Management System Lab	50	-	50	2	1
2	Course -6	**Major-6:** Data Structures	100	40	60	3	3
		Data Structures Lab	50	-	50	2	1
3	Course -7	**Major-7:** Object Oriented Programming through Java	100	40	60	3	3
		Object Oriented Programming through Java Lab	50	-	50	2	1
4	Course -8	**Major-8:** Software Engineering	100	40	60	3	3
		Software Engineering Lab	50	-	50	2	1
5	**Minor-2**	**Organization Behavior**	100	40	60	5	4
6	Skill Courses	Information and Communication Technology (ICT)	50	----	50	2	2
7	Multi Disciplinary Course	Health and Hygiene	50	-----	50	2	2
	Total		**800**	**200**	**600**	**29**	**24**

APPROVED

K. Padmavathi
Bharuna.

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B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-5: DATA BASE MANAGEMENT SYSTEM

Theory | Credits: 3 | 3 hrs/week

Course Objectives:

- Graduateswillhavetheexpertiseinanalyzingrealtimeproblemsandproviding appropriate solutions related to Computer Science & Engineering.
- Graduates will have the knowledge of fundamental principles and innovative technologies to succeed in higher studies and research.
- Graduates will continue to learn and to adapt technology developments combined with deep awareness of ethical responsibilities in profession.

Course Outcomes:

- An ability to apply Knowledge of computing and mathematics in Computer Science & Engineering.
- An ability to analyze a problem, identify and define the computing requirements appropriate to its solution.
- An ability to design, implement and evaluate a computer-based system to appropriate societal considerations.
- An ability to conduct investigations, interpret data and provide conclusions in investigating complex problems related to Computer Science & Engineering.
- An ability to engage in continuing professional development and life-long learning.

UNIT-I

Overview of Database Systems: Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications.

Data Models: Introduction; types of data models, Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence, Centralized and Client Server architecture for the database.

UNIT-II

Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, constraints (Domain, Key constraints, integrity constraints), concept of keys(super key, candidate key, primary key, surrogate key, foreign key) , relational Algebra & relational calculus.

Normalization: Schema refinement, concept of functional dependency, Normal Forms based on functional dependency(1NF, 2NF and 3 NF),Boyce-codd normal form(BCNF).

UNIT-III

Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, ER Diagram.

BASIC SQL: Database schema, data types, DDL operations (create, alter, drop, rename), DML operations (insert, delete, update), basic SQL querying (select and project) using where clause, arithmetic & logical operations, aggregation.

UNIT-IV

SQL: Nested queries/ sub queries, implementation of different types of joins, Creating tables with relationship, implementation of key and integrity constraints, views, relational set operations, Transaction Control Language: commit, Rollback, Save point, DCL :Grant, Revoke

UNIT-V

PL/SQL: Introduction, Structure, Control Structures, Cursors, Procedure, Function.

Transaction processing Concepts: Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability.

Database management systems Text Books

- DatabaseManagementSystems,3rd Edition, Raghurama Krishnan, Johannes Gehrke, TMH
- DatabaseSystemConcepts,5th Edition, Silberschatz, Korth, TMH

GUIDELINES TO THE PAPER SETTER

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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-5: DATA BASE MANAGEMENT SYSTEM

Time: 3 Hours | Max.Marks: 60

Answer any five questions choosing at least two questions from Sections I & II

Section – I (5X8=40Marks)

1. Explain the characteristics of Database Systems.
2. Explain various Data Models.
3. Explain the concept of Keys in DBMS.
4. Explain Relational Algebra with examples.
5. Explain 1NF, 2NF and 3NF with examples

Section – II

6. Explain ER Diagram.
7. Explain DDL operations with examples.
8. Explain different types of joins.
9. Explain the concept of Views.
10. Explain ACID properties.

Section – III (5X4=20Marks)

Answer any five questions from the following.

11. Write about Database Applications.
12. Write about Data Independence.
13. Write about BCNF.
14. Write about Entities and Attributes.
15. Write about any 5 Basic SQL queries.
16. Write about DCL commands.
17. Write about PL/SQL.
18. Write about Functions in PL/SQL.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-III

(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-5: DATA BASE MANAGEMENT SYSTEM LAB

Practical | Credits:1 | 2 hrs/week

List of Experiments

SQL:

Cycle-I: Aim: Marketing company wishes to computerize their operations by using following tables.

Table Name: Client-Master

Description: Used to store client information

Column Name	Data Type	Size	Attribute
CLIENT_NO	Varchar2	6	Primary key
NAME	Varchar2	20	Not null
ADDRESS1	Varchar2	30	
ADDRESSS	Varchar2	30	
CITY	Varchar2	15	
PINCODE	Varchar2	8	
STATE	Varchar2	15	
BAL_DUE	Number	10,2	

Table Name: Product_Master

Description: Used to store product information

Column Name	Data Type	Size	Attribute
PRODUCT_NO	Varchar2	6	Primary key
DESCRIPTION	Varchar2	15	Not null
PROFIT_PERCENT	Number	4,2	Not null
UNIT_MEASUE	Varchar2	10	
QTY_ON_HAND	Number	8	
REORDER_LVL	Number	8	
SELL_PRICE	Number	8,2	Not null, cannot be 0
COST_PRICE	Number	8,2	Not null, cannot be 0

Table Name: Salesman_master
Description: Used to store salesman information working for the company.

Column Name	Data Type	Size	Attribute
SALESMAN_NO	Varchar2	6	Primary key
SALESMAN_NAME	Varchar2	20	Not null
ADDRESS1	Varchar2	30	
ADDRESS2	Varchar2	30	
CITY	Varchar2	20	
PINCODE	Number	8	
STATE	Vachar2	20	
SAL_AMT	Number	8,2	Not null, cannotbe0
TGT_TO_GET	Number	6,2	Not null, cannotbe0
YTD_SALES	Number	6,2	Not null
REMARKS	Varchar2	20	

Table Name: SALES- ORDER

Description: Used to store client's orders

Column Name	Data Type	Size	Attribute
ORDER_NO	Varchar2	6	Primary key
CLIENT_NO	Varchar2	6	Foreign Key
ORDER_DATE	Date		
DELY_ADDRESS	Varchar2	25	
SALESMAN_NO	Varchar2	6	Foreign Key
DELY_TYPE	Char	1	Delivery :part(p)/full(f)and default 'F'
BILL_YN	Char	1	
DELY_DATE	Date		Can't be less than order date
ORDER_STATUS	Varchar2	10	Values("In Process", "Fulfilled", "Back Order", "Cancelled.

Table Name: SALES_ORDER_DETAILS
Description: Used to store client's order with details of each product ordered.

Column Name	Data Type	Size	Attribute
ORDER_NO	Varchar2	6	Primary key references SALES_ORDER table
PRODUCT_NO	Varchar2	6	Foreign Key references SALES_ORDER_table
QTY_ORDERED	Number	8	
QTY_ DISP	Number	8	
PRODUCT_RATE	Number	10,2	Foreign Key

Solve the following queries by using above tables.

1. Retrieve the list of names, city and the state of all the clients.
2. List all the clients who are located in 'Mumbai' or 'Bangalore'.
3. List the various products available from the product_ master table.
4. Find the names of salesman who have a salary equal toRs.3000.
5. List the names of all clients having 'a' as the second letter in their names.
6. ListallclientswhoseBaldueisgreaterthanvalue1000.
7. List the clients who stay in a city whose first letter is 'M'.
8. List all information from sales-order table for orders placed in the month of July.
9. List the products whose selling price is greater than 1000and less than or equal to3000.
10. Findtheproductswhosesellingpriceisgreaterthan1000andalsofindthe new selling price as original selling price 0.50.

Cycle-II Supplier

Aim: A manufacturing company deals with various parts and various suppliers supplytheseparts.Itconsistsofthreetablestorecorditsentireinformation.Those are as follows.

Supplier(Supplier_No,Sname,City,status)Part(Part_no,pname,color,weight,city, cost)
Shipment (supplier_No, Part_no, city) JX(project_no, project_name, city)
SPJX(Supplier_no, part_no, project_no,city)

1. Get supplier numbers and status for suppliers in Chennai with status>20.
2. Get project names for projects supplied by supplier 'S'.
3. Get colors of parts supplied by supplier S.
4. Get part numbers for parts supplied to any project in Mumbai.
5. Find the id's of suppliers who supply a red or pink parts.

Cycle–III Employee Database

Aim: An enterprise wishes to maintain a database to automate its operations. Enterprise divided into a certain departments and each department consists of employees. The following two tables describes the automation schemas.

Emp(Empno, Ename, Job, Mgr, Hiredate, Sal, Comm, Deptno)

Dept(Deptno, Dname, Loc)

1. List the details of employees who have joined before the end of September '81.
2. List the name of the employee and designation of the employee, who does not report to anybody.
3. Listthename,salaryandPFamountofalltheemployees(PFiscalculatedas10%of salary)
4. List the names of employees who are more than 2yearsold in the organization.
5. Determine the number of employees, who are taking commission.
6. Updatetheemployeesalaryby20%, whos experience is greater than 12years.
7. Determine the department does not contain any employees.
8. Create a view, which contains employee name and their manager names working in sales department.
9. Determine the employees, whose total salary is like the minimum salary of any department.
10. List the department numbers and number of employees in each department.

PL/SQL PROGRAMS

1. Write a PL/SQL program to check the given string is palindrome or not.
2. The HRD manager has decide to raise the employee salaryby15% write a PL/SQL block to accept the employee number and update the salary of that employee. Display appropriate message based on the existence of the record in Emp table.
3. Write a PL/SQLprogramtodisplaytop10rowsin Emp table based on their job and salary.
4. Write a PL/SQL program toraisetheemployeesalaryby10%fordepartment number 30 people and also maintain the raised details in the raise table.
5. Createaproceduretoupdatethesalariesof Employeesby20%,for those who are not getting commissio
6. Write a PL/SQL procedure to prepare an electricity bill by using following table. Table used: Elec

Name	Null?	Type
MNNO	NOTNULL	NUMBER(3)
CNAME		VARCHAR2(20)
CUR_READ		NUMBER(5)
PREV_READ		NUMBER(5)
NO_UNITS		NUMBER(5)
AMOUNT		NUMBER(8,2)
SER_TAX		NUMBER(8,2)
NET_AMT		NUMBER(9,2)

7. Create a trigger to avoid any transactions (insert, update,delete)on EMP table on Sunday.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-6: DATA STRUCTURES

Theory | Credits: 3 | 3 hrs/week

Course Objectives:

- Theobjectiveofthecourseistomakeastudenttoimplementdatastructuresand organize and manage data, based on data structures for efficient access.

Course Out comes:

- Identify data structures suitable to solve any specific problem.
- Identifying various data structures and their real-time
- Applications Identifying the use of Time and Space Complexity.
- Implementing different sorting & searching techniques.

Unit-I

Introduction and Overview- Elementary Data Organization, Data Structures classification, DataStructureOperations,Algorithms:Complexity,Time-SpaceTradeoff.

Preliminaries- Algorithmic Notation, Control Structures used in algorithms, Asymptotic Notations, Variables, Data Types.

Unit-II

Arrays, Records and Pointers –Linear Arrays, Representation and Traversing Linear Arrays, Inserting and Deleting. Passing an array to function, Pointer & Arrays Multidimensional Arrays.

Unit-III

LinkedLists–Representation,DynamicMemoryAllocation,Traversing,Searching, Insertion, Deletion,

Stacks-Stacks, Operations on stacks, Array representation of stacks

Unit-IV

Queues, Array representation of Queues, Deques, Priority Queues.

Sorting –Insertion Sort, Bubble Sort, Selection sort, Quick Sort, Merge sort, Searching–Linear Search, Binary Search.

Unit-V

Trees- Binary trees, Representing and traversing binary trees
Binary Search Trees, Searching, Insertion and Deletion in Binary Search Trees,

Graphs-Terminology, Operations on Graphs, Traversing a Graph.

REFERENCE BOOKS:

1. Data Structures & Algorithms Using C, Khanna Publishers
2. Theory and Problems of Data Structures by Seymour Lipschutz, McGraw Hill (Schaum's Outlines)
3. Data Structures & Algorithms in C by M.A.Weiss, Addison Wisley.
4. Data Structures Using C, Reema Thareja, oxford.

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B.C.A II Year SEMESTER-III
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MAJOR COURSE 6: DATA STRUCTURES

Time: 3 Hours Max.Marks: 60

Answer any five questions choosing at least two questions from Sections I & II

Section – I **(5X8=40Marks)**

1. Define Data Structure and explain classification of Data Structures.
2. Discuss the Time and Space complexity of an Algorithm..
3. Define Array. Explain the concept of arrays in detail.
4. Explain the concept of Pointers in detail.
5. Define Function. Explain the concept of passing an Array to Functions.

Section – II

6. Define Linked List. Explain operations performed on Linked List.
7. Discuss the implementation of Stack using Arrays.
8. Explain the Queue Data Structure in detail.
9. Explain Binary Search mechanism with an example.
10. Explain tree traversing techniques in detail.

Section – III **(5X4=20Marks)**

Answer any five questions from the following.

11. Write notes on Data Types.
12. Describe Asymptotic Notations.
13. Explain operations on Arrays.
14. Dynamic Memory Allocation.
15. PUSH & POP operations.
16. Explain Selection sort.
17. Binary Search Tree (BST).
18. Operations on Graphs.

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B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-6: DATA STRUCTURES LAB

Practical | Credits: 1 | 2 hrs/week

List of Lab Experiments

a. Write a C program to Implement matrix multiplication.
b. Write a C program to Implement stack using arrays.
c. Write a C program to Implement queue using arrays.
d. Write a C program to Implement circular queue using arrays.
e. Write a C program to Implement dequeue using arrays.
f. Write a C program to Implement single linked list using the method screate(), insert(), search(), delete() and display().
g. Write a C program to Implement double linked list.
h. Write a C program to Implement stack using linked list.
i. Write a C program to Implement queue using linked list.
j. Give a solution to towers of Hanoi using C program.
k. Write a C program to Implement bubble sort.
l. Write a C program to Implement selection sort.
m. Write a C program to Implement in sertion sort.
n. Write a C program to Implement merge sort.
o. Write a C program to Implement quick sort.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-7: OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Theory — Credits: 3 — 3 hrs/week

Course Objectives:

To make the students understand the fundamentals of Java programming.

- To expose the students to Window based applications using AWT
- To make the students to design appropriate Exception Handling in Java
- To make the students to understand the concepts of Threads Files and
- I/O Streams, Applets Networking in java.

Course Outcomes:

The student would become competent enough to write, debug ,and document well-structured java applications

- Demonstrate good object-oriented programming skills in Java
- Able to describe recognize, apply, and implement selected design patterns in Java
- Understand the capabilities and limitations of Java
- Be familiar with common errors in Java and its associated libraries
- Develop excellent debugging skills

UNIT-I

Introduction to OOPS: Paradigms of Programming Languages – Basic concepts of Object Oriented Programming – Differences between Procedure Oriented Programming and Object Oriented programming - Benefits of OOPs – Application of OOPs. **Java:** History – Java features – Java Environment – JDK – API.

Introduction to Java: Creating and Executing a Java program – Java Tokens- Java Virtual Machine (JVM) – Command Line Arguments –Comments in Java program. **Elements:** Constants – Variables – Data types - Scope of variables – Type casting – **Operators:** Special operators – Expressions – Evaluation of Expressions.

UNIT-II

Control Structures: The if Statement, Nested ifs, The if-else-if Ladder and Looping Statements: The while Loop, The do-while Loop, for loop and its variations and Nested Loops. Jumping Statements: Break, Continue Statement.

Class and Objects: Defining a Class–Methods–Creating Objects–Accessing Class members– Constructors Parameterized Constructors, Adding a Constructor. **Arrays:** One Dimensional Array – Creating an array – Array processing–Multidimensional.

UNIT-III

Inheritance: Defining inheritance –types of inheritance– Method overloading – Static members – this keyword - Overriding methods – Final variables and methods – Final classes – Final methods - Abstract methods.

Interfaces: Defining interface – Extending interface - Implementing Interface – Accessing interface Variables. Strings: Constructing Strings, Operating on Strings, Arrays of Strings.

UNIT–IV

Packages: Java API Packages – Defining a Package, Creating & Package Member Access.

Multithreading: Creating Threads – Life of a Thread – Defining & Running Thread – Thread Methods – Thread Priority – Synchronization –Implementing Runnable interface – Thread Scheduling.

UNIT–V

Exception Handling: Limitations of Error handling–Advantages of Exception Handling-Types of Errors–Basics of Exception Handling-Syntax of Exception Handling Code, Multiple Catch Statements, Using finally Statement, Throwing Our Own Exceptions

Applets: Introduction, Java applications versus Java Applets, Applet Life-Cycle, Working with Applets, The HTML Applet Tag.

TEXT BOOKS:

1. **Object Oriented Programming through Java,** Universities Press, by P.Radha Krishna.
2. E.Balagurusamy,"*ProgrammingwithJava*",TataMc-GrawHill,5th Edition.

REFERENCES:

1. HerbertSchildt,"ThecompletereferenceJava",TataMc-GrawHill,7thEdition.

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MAJOR COURSE-7: OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Time: 3 Hours Max.Marks: 60

Answer any five questions choosing at least two questions from Sections I & II

Section – I **(5X8=40Marks)**

1. Explain the concepts of Object Oriented Programming.
2. Explain various Data Types in Java.
3. Explain various Loop Statements in Java.
4. Explain the concept of Constructors in Java.
5. Define Array. Explain One Dimensional Array with an example.

Section – II

6. Define Inheritance. Explain the types of Inheritance.
7. Define Interface. Explain Extending Interface with an example.
8. Explain the concept of Packages.
9. Discuss the Life Cycle of a Thread.
10. Define an Exception. Explain Exception Handling with an example.

Section – III **(5X4=20Marks)**

Answer any five questions from the following.

11. Write about Applications of OOP.
12. Write about JVM.
13. Explain If-Else statement with an example.
14. Write about Method Overloading.
15. Write about this keyword.
16. Write about Synchronization.
17. What are the Advantages of Exception Handling?
18. Write about Applet Life Cycle.

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MAJOR COURSE-7: OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

Practical | Credits:1 | 2 hrs/week

List of Lab Experiments

1 Write a program to print Biggest of3Numbers using Logical Operators.

2 Write a program to Test the Prime number.

3 Write a program to create a Simple class to find out the Area and perimeter of rectangle and box using super and this keyword.

4 Write a program to design a class account using the inheritance and static that show all function of bank (withdrawal, deposit).

5 Write a program to design a class using abstract methods and classes.

6 Write a program to design a string class that perform string method(equal, reverse the string, change case).

7 Write a program to handle the exception using try and multiple catch block.

8 Writeaprogramthatimporttheuserdefinepackageandaccessthemembervariable of classes that contained by package.

9 Write a program that show the implementation of inter face.

10 Write a program to create a thread that implement the run able interface.

11 Write a program to draw the line, rectangle, oval, text using the graphics method.

12 Write a program to create menu using the frame.

13 Write a program to create dialog box.

14 Write a program to implement the flow layout and border layout.

15 Write a program to create Frame that display the student information.

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B.C.A II Year SEMESTER-III
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MAJOR COURSE-8: SOFTWARE ENGINEERING

Theory | Credits: 3 | 3 hrs/week

Course Objectives: The Objective of the course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Course Outcomes

1. Ability together and specify requirements of the software projects.
2. Ability to analyze software requirements with existing tools
3. Able to differentiate different testing methodologies
4. Able to understand and apply the basic project management practices in real life projects
5. Ability to work in a team as well as independently on software projects

Syllabus

UNIT-I

Introduction to Software Engineering: Definitions-Quality and Productivity Factors – Managerial Issues.

Planning a software project: Defining the problem - Developing a Solution Strategy - Planning the Development Process - Planning an Organization structure.

UNIT– II

Software Cost Estimation: Software cost factors- Software Cost Estimation Techniques - Estimating Software Maintenance Costs - The Software Requirement Specification - Formal Specification Techniques - Languages and Processors for Requirement Specification.

UNIT– III

Software design: Fundamental Design Concepts - Modules and Modularization Criteria – Design Notations -Design Techniques - Detailed Design Considerations.

Test Plans- Milestones, walkthroughs, and Inspections.

UNIT-IV

User interface design and real time systems: User interface design - Human factors - Human computer interaction - Human - Computer Interface design - Interface design - Interface standards.

UNIT-V

Software quality and testing: Software Quality Assurance - Quality metrics - Software Reliability - Software testing - Path testing – Control Structures testing - Black Box testing - Integration, Validation and system testing - Reverse Engineering and Reengineering.

REFERENCE BOOKS:

1. R. Fairley, Software Engineering Concepts, Tata McGraw-Hill, 1997.
2. R.S. Pressman, Software Engineering, Fourth Ed.,Mc GrawHill,1997.
3. Software Engineering, H. SommervillI an, Addition Wesley Pub.Co.
4. Software Engineering: An object Oriented Perspective by Braude,E.J.,Willey,2001.

Student Activity:

1. Visit any financial organization near by and prepare requirement analysis report.
2. Visit any industrial organization and prepare risk chart.

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Unit No.	Essay Questions	Short Answer Questions
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MAJOR COURSE-8: SOFTWARE ENGINEERING

Time: 3 Hours | Max.Marks: 60

Answer any five questions choosing at least two questions from Sections I & II

Section – I **(5X8=40Marks)**

1. Explain about Quality and Productivity Factors.
2. Explain Planning the Development Process.
3. Define Software Cost. Explain Software cost factors.
4. Explain Software Cost Estimation Techniques.
5. Describe Software Requirements Specification in detail.

Section – II

6. Explain Design Concepts.
7. Write notes on Test Plans in detail.
8. Explain User Interface Design.
9. Describe Human-Computer Interface Design.
10. Illustrate various Software Testing Techniques.

Section – III **(5X4=20Marks)**

Answer any five questions from the following.

11. Discuss Managerial Issues.
12. Explain Organizational structure.
13. Explain Languages and Processors for Requirement Specification.
14. Explain Design Techniques.
15. Discuss Modularization Criteria
16. Explain Human computer interaction.
17. Write a short note on Software Quality Assurance.
18. Write a short note on Software Quality metrics.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-8: SOFTWARE ENGINEERING LAB

Practical | Credits:1 | 2 hrs/week

(Using Object Oriented Analysis and Design (OOAD))

Case Studies:

1. Student Marks Analysis System
2. E-Commerce Management System
3. Inventory Control System
4. Food Delivery Management system
5. Logistics Management System

Choose any two of above case studies and do the following exercises for that Case Study

1. Write the complete problem statement
2. Write the software requirements specification document
3. Draw the entity relationship diagram
4. Draw the data flow diagrams
5. Draw use case diagrams
6. Draw activity diagrams for all use cases
7. Draw sequence diagrams for all use cases
8. Draw collaboration diagram
9. Assign objects in sequence diagrams to classes and make class diagram.

Note: 1. To draw data flow diagrams using Microsoft Visio Software, Smart Draw, etc…

2. To draw UML diagrams using Rational Rose Software, Star UML, etc.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MINOR COURSE-2: ORGANIZATIONAL BEHAVIOUR
(BCA Minor 2 / BBA Major 6)

Theory | Credits: 4 | 4 hrs/week

Course Objectives:

- To understand individual and group behavior at work place to improve the effectiveness of an organization.
- To understand different types of personality and learning styles.
- Comprehend concepts relating to group dynamics and conflict management.
- To understand leadership and its impact on group dynamics.
- To understand the process of Change management and issues involved in it.
- To understand organizational culture and organizational effectiveness.

UNIT-I:ORGANIZATIONAL BEHAVIOR

Organizational behavior Meaning, significance, evolution. Factors influencing organizational behaviour- Perception – concept and process of perception, Factors influencing perception. Values and Attitudes. Personality - Stages of personality development, Determinants of personality. Concept of Learning and the ories of learning.

UNIT-II: GROUP DYNAMICS

Meaning of groups and group dynamics, Stages in the Formation of groups, Characteristics and Typesofgroups.Factorsinfluencinggroupeffectiveness-Groupcohesiveness,Groupdecisionmaking. Teams-Groups Vs Teams , Types of teams. Conflicts in groups- reasons for conflicts, Management of Conflict-application of Transactional Analysis, Johari Window.

UNIT-III: LEADER SHIP

Definition and Concept of Leadership, importance of Leadership, characteristics of an Effective Leader. Styles of Leadership, Managerial Grid,. Theories of Leadership. Impact of Leadership on effectiveness of groups .

UNIT-IV: MANAGEMENT OF CHANGE

Meaning and importance of Change, Factors driving organizational change. Response to change, role of Change Agents. Resistance to Change – Reasons for Resistance, dealing with resistance to change..

UNIT-V:ORGANIZATIONAL CULTURE

Concept of Organizational Culture, Significance of understanding organizational culture, Distinctionbetweenorganizationalcultureandorganizationalclimate.FactorsinfluencingOrganizationalCulture.OrganizationalEffectiveness-Indicatorsoforganizationaleffectiveness,achievingorganizationaleffectiveness..

Reference Books:

1. Robbins, P.Stephen–O B-Concepts,Controversies&Applications-PrenticeHall of IndiaLtd., New Delhi.
2. LuthansFred–Organizational Behaviour-McGrawHillPublishersCo. Ltd.,NewDelhi,
3. Rao,VSPandNarayana,P.S.-OrganizationTheory&Behaviour-KonarkPublishersPvt.Ltd.,Delhi.

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B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MINOR COURSE-2: ORGANIZATIONAL BEHAVIOUR
(BCA Minor 2 / BBA Major 6)

Time: 3 Hours | Max.Marks: 60

PART-I

Answer any FIVE questions from the following. **5X4=20M**

1. Perception
2. Group Dynamics
3. Leadership traits.
4. Role Conflict.
5. Organizational Climate
6. Determinates of Personality
7. Transactional analysis.
8. Organisational culture.

PART–II

Answer any **FIVE** of the following by selecting at least **TWO** from each Section **5X8=40M**

SECTION-A

9. Explain the nature ,scope and importance of Organizational Behaviour.
10. Explain the reasons for interpersonal conflicts.
11. Define Leadership and describe different Leadership styles.
12. Describe the factors driving Organizational change.
13. Analyse the factors influencing organsational cultural .

SECTION-B

14. Explain the theories of learning.
15. Analyse the Johari Window model.
16. Describe the Managerial Grid theory of leadership.
17. State the reasons for resistance to change.
18. Explain the indicators of Organizational effectiveness .

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INFORMATION AND COMMUNICATION TECHNOLOGY

SKILL COURSE

SEMESTER-III

Course Duration: 30 Hours **Credits -2**

Objectives:

This course aims at acquainting the students with basic ICT tools which help them in their day to day and life as well as in office and research.

Course outcomes:

After completion of the course, student will be able to;

1. Understand the literature of social networks and their properties.
2. Explain which network is suitable for whom.
3. Develop skills to use various social networking sites like twitter, flickr, etc.
4. Learn few GOI digital initiatives in higher education.
5. Apply skills to use online forums, docs, spreadsheets, etc for communication, collaboration and research.
6. Get acquainted with internet threats and security mechanisms.

SYLLABUS:

UNIT-I: (08 hrs)

Fundamentals of Internet: What is Internet?, Types of Networks, Network topologies, Internet applications, Internet Addressing – Entering a Web Site Address, URL–Components of URL, Searching the Internet, Browser–Types of Browsers, Introduction to Social Networking: Twitter, Tumblr, LinkedIn, Facebook, flickr, Skype, yahoo, YouTube, Whats App .

UNIT-II:(08 hrs)

E-mail: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management.

G-Suite: Google drive, Google documents, Google spread sheets, Google Slides and Google forms.

UNIT-III:(10 hrs)

Overview of Internet security, E-mail threats and secure E-mail, Viruses and antivirus software, Firewalls, Cryptography, Digital signatures, Copyright issues.

What are GOI digital initiatives in higher education? (SWAYAM, SwayamPrabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, eacharya, e-Yantra and NPTEL).

RECOMMENDED CO-CURRICULAR ACTIVITIES: (04 hrs)

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

1. Assignments(in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz and Group Discussion
4. Slip Test
5. Try to solve MCQ's available online.
6. Suggested student hands on activities :

a. Create your accounts for the above social networking sites and explore them, establish a video conference using Skype.

b. Create an Email account for yourself- Send an email with two attachments to another friend. Group the email addresses use address folder.

c. Register for one online course through any of the online learning platforms like NPTEL, SWAYAM, Alison, Codecademy, Coursera. Create a registration form for your college campus placement through Google forms.

Reference Books :

1. In-line/On-line : Fundamentals of the Internet and the World Wide Web, 2/e – By Raymond Greenlaw and Ellen Hepp, Publishers : TMH

2. Internet technology and Web design, ISRD group, TMH.

3. Information Technology – The breaking wave, Dennis P.Curtin, Kim Foley, Kunai Sen and Cathleen Morin, TMH.

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Unit No.	Section-I EQ's	Section-II SAQ's
I	2	2
II	2	2
III	1	2

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INFORMATION AND COMMUNICATION TECHNOLOGY
SKILL COURSE
SEMESTER-III

Time: 2 Hours **Max. Marks: 50**

SECTION – I

Note: Answer any three of the following. Each one carries 10 Marks. 3 x 10 = 30 M

1. Essay Question from **Unit-1**
2. Essay Question from **Unit-1**
3. Essay Question from **Unit-2**
4. Essay Question from **Unit-2**
5. Essay Question from **Unit-3**

SECTION – II

Note: Answer any Four of the following. Each one carries 5 Marks. 4 X 5=20 M

6. Short Answer Question from **Unit-1**
7. Short Answer Question from **Unit-1**
8. Short Answer Question from **Unit-2**
9. Short Answer Question from **Unit-2**
10. Short Answer Question from **Unit-3**
11. Short Answer Question from **Unit-3**

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B.C.A II Year SEMESTER-IV

(w.e.f. 2023-24 Admitted Batch)

S. NO	Course	Name of thesubject	Total Marks	Mid. Sem. Exam	Sem. End. Exam	Teaching Hours	Credits
1	Course-9	**Major-9:** Python Programming	100	40	60	3	3
		Python Programming Lab	50	-	50	2	1
2	Course -10	**Major-10:** Operating Systems	100	40	60	3	3
		Operating Systems Lab	50	-	50	2	1
3	Course -11	**Major-11:** Mobile Application Development using Android	100	40	60	3	3
		Mobile Application Development using Android Lab	50	-	50	2	1
4	**Minor-3**	**Marketing Management**	100	40	60	5	4
5	**Minor-4**	**Human Resource Management**	100	40	60	5	4
6	Skills Course	Tourism Guidance	50	-	50	2	2
7	MULTI DISCIPLINARY COURSE	Introduction to Nanotechnology	50	-	50	2	2
	Total		**800**	**200**	**550**	**29**	**24**

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-9: PYTHON PROGRAMMING

Theory — Credits: 3 — 3 hrs/week

Unit-I

Getting Started with Python: Introduction to Python, Python Keywords, Identifiers, Variables, Comments, Data Types, Operators, Input and Output, Type Conversion, Debugging. Flow of Control, Selection, Indentation, Repetition, Break and Continue Statement, Nested Loops .

Strings-String Operations.

Unit-II

Functions: Functions, Built-in Functions, User Defined Functions, recursive functions, Scope of a Variable.

Python and OOP: Defining Classes, Defining and calling functions passing arguments, Inheritance, polymorphism, Modules – date time, math, Packages.

Exception Handling- Exception in python, Types of Exception, User-defined Exceptions.

Unit-III

List: Introduction to List, List Operations, Traversing a List, List Methods and Built-in Functions.

Tuples and Dictionaries, Introduction to Tuples, Tuple Operations, Tuple Methods and Built-in Functions. Introduction to Dictionaries, Dictionaries are Mutable, Dictionary Operations, Traversing a Dictionary, Dictionary Methods and Built-in functions.

Unit-IV

Introduction to NumPy, Array , NumPy Array , Indexing and Slicing , Operations on Arrays , Concatenating Arrays.

Data Handling using Pandas , Introduction to Python Libraries, Series, Data Frame, Importing and Exporting Data between CSV Files and Data Frames, Pandas Series Vs NumPy ndarray.

Unit-V

Plotting Data using Matplotlib: Introduction, Plotting using Matplotlib –Line chart, Bar chart. Histogram, Scatter Chart, Pie Chart.

GUI Programming and Database Connectivity Using Python. Graphical User Interfaces. Using the Tkinter Module, Creating Label, Text, Buttons, info Dialog Boxes, Radio button, Check button, Getting Input, Importing MySQL for Python , Connecting with a database, Forming a query in MySQL, Passing a query to MySQL.

References:

1. MarkLutz,LearningPython,5thEd.O"REILLY
2. Core Python Programming by Dr. R. Nageswara Rao
3. Problem Solving and Python Programming by E. Balaguru Swamy
4. Python programming: using problem solving approach by ReemaThareja.
5. Albert Lukaszewski, MySQL fo rPython, Packet Publishing

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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-9: PYTHON PROGRAMMING

Time: 3 Hours | Max.Marks: 60

Answer any five questions choosing at least two questions from Sections I & II

Section – I **(5X8=40Marks)**

1. Explain various Data Types in Python.
2. Explain various Operators in Python.
3. Define Function. Explain User Defined Functions in Python with an example.
4. Explain the concept of Inheritance in Python.
5. What is an Exception Handling? Explain Types of Exceptions.

Section – II

6. Discuss various List Operations.
7. Discuss various Dictionary Operations.
8. Explain Operations on Arrays.
9. Explain various Python Libraries.
10. Explain Tkinter Module.

Section – III **(5X4=20Marks)**

Answer any five questions from the following.

11. Write about Keywords in Python
12. Write about Type Conversion.
13. Write about Packages.
14. Write a short note on Tuples in Python.
15. Write about Built-in Functions in Dictionary.
16. Write about Data Frame.
17. Write about Graphical User Interfaces.
18. Write about how to pass a query to MySQL

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B.C.A II Year SEMESTER-IV

(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-9: PYTHON PROGRAMMING

Practical Credits:1 2 hrs/week

Lab Programs

1. Write a Program to check whether given number is Arm strong or not.
2. Write a Program to check whether given number is perfect or not.
3. Write a program to find factorial of given number using recursive function
4. Write a program to implement inheritance and polymorphism
5. Demonstrate a python code to print try, except and finally block statements
6. Write a program to demonstrate String handling functions
7. Write a program to input numbers from the user. Store these numbers in a tuple. Print the maximum and minimum number from this tuple.
8. Write aprogramtoenternamesofemployeesandtheirsalariesasinputandstorethemina dictionary
9. Write a program to implement statistical operations on arrays using num Py
10. Write a program to import and export CSV file to Data Frame.
11. Create the Data Frame Sales containing year wise sales and perform basic operation on it.
12. Visualize the plots using mat plotlib.
13. Create GUI interface with different types button and labels
14. Create GUI interface and connect with My SQL data base and perform CRUD(Create, Read, Update and Delete) operations.

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-10: OPERATING SYSTEMS

Theory | Credits: 3 | 3 hrs/week

Course Objectives:

1. To know the basic Structure, Components and Organization of Operating System.
2. To learn the notation of a Process- a Program in Execution, Management, Scheduling and Classic Problems of Synchronization.
3. To gain knowledge in various Memory Management Techniques.
4. To understand Unix Operating System and Various File operations.

Course Outcomes:

The students will be able to:

1. Understand the main components and Structure of Operating System & their functions.
2. Analyze various ways of Process Management & CPU Scheduling Algorithms.
3. Evaluate various device and resources like Memory, Time and CPU Management techniques in distributed systems.
4. Apply different methods for Preventing Dead locks in a Computer System.
5. Create and build an Application/Service over the UNIX operating system.

Unit-I

Introduction: Definition of Operating System, Evolution of OS, Basic OS Functions, Computer System Architecture, Operating System Structure.

System Structures: Operating System Services, User Operating System Interface, System Calls, Types of System Calls, Over view of UNIX operating System, Basic Features of Unix Operating System.

Unit-II

Process Management: Process Concepts, Operation on Processes, Communication in Client-Server Systems.

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms,

Unit-III

Synchronization: Process Synchronization, Semaphores: Usage, Implementation, The Critical Section Problem.

Deadlocks: Introduction, Deadlock Characterization, Necessary and Sufficient conditions for Deadlock, Deadlock Handling Approaches: Deadlock prevention, Deadlock Avoidance and Deadlock detection and Recovery.

Unit-IV

Memory Management: Overview, Swapping, Contiguous Memory Allocation, Paging, Paging Examples, Segmentation, Page Replacement Algorithms, Memory management in UNIX.

Unit-V

Files and Directories in UNIX: Files, Directory Structure, File Operations,File System Implementation: File Allocation Methods.

TEXT BOOKS:

1. Operating System Concepts: Abraham Silberschatz, PeterB. Galvin, Greg Gagne,8th Edition, Wiley.
2. Unix and shell Programming by B.MHArwani, OXFORD University Press.

REFERENCE BOOKS:

1. Operating System Principles, Abraham Silberchatz, PeterB.Galvin,Greg Gagne8thEdition, Wiley Student Edition.
2. Principles of Operating Systems by Naresh Chauhan, OXFORD University Press.
3. Tanenbaum A S, Woodhull A S, Operating System Design and Implementation,3rd edition, PHI 2006.
4. Unix Shell Programming-Yashwant Kanetkar

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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-10: OPERATING SYSTEMS

Time: 3 Hours Max.Marks: 60

Answer any five questions choosing at least two questions from Sections I & II

Section – I **(5X8=40Marks)**

1. What is Operating system. Write types of Operating systems.
2. What is system program. Discuss types of system calls.
3. What is process control block. Explain
4. Write about context switching. Explain operations on processes.
5. Differentiate preemptive and non preemptive scheduling algorithms.

Section – II

6. What is semaphore. Explain Critical section problem in detail.
7. What is deadlock. Discuss Deadlock prevention.
8. What is swapping .Discuss
9. Discuss demand paging and segmentation
10. Illustrate file allocation methods.

Section – III **(5X4=20Marks)**

Answer any five questions from the following.

11. Multiprogramming
12. Throughput
13. Virtual machine
14. Dispatch latency
15. Multilevel feedback scheduling
16. Critical region
17. Safe sequence
18. Compaction

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(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-10: OPERATING SYSTEMS LAB

Practical | Credits: 1 | 2hrs/week

List of Experiments

1. Introducing the LINUX Nativeeditorvi: Working on basics of creating and editing a text file using standard commands of vi.
2. Introduction to UNIX Operating System, Compare with Windows OS. Writing and executing simple Hello World C Program in UNIX Environment.
3. Getting hands-on basic UNIX Commands.
4. Writeaprogramusingthefollowingsystemcallsof UNIXOSfork,exec,getpid,exit,wait, close, open dir, read dir ?
5. Write a Simple shell script for basic arithmetic and logical calculations?
6. Write Shell script to check the given number is even or odd?
7. Write a shell script to swap the two integers?
8. Write Shell script to perform various operations on given strings.
9. Write Shell scripts to explores stem variables such as PATH ,HOME etc.
10. Write a shell script to display list of users currently logged in.
11. Write a shell script to delete all the temporary files.
12. Write a shell script to find the Factorial of a Number ?
13. Write C programs to implement the following Scheduling Algorithms:
    a) First Come First Serve.
    b) Shortest Job First.
    c) Round Robin.

Reference Text Books:

1. BrianW.KernighanandRobPike,"TheUNIXProgrammingEnvironment"Prentice HallIndia(EditionavailableinLRCandintheformofEBookonstudentresource).
2. YashwantKanetkar,"UNIXShellProgramming"BPBPublications(FirstEdition).

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-11: MOBILE APPLICATION DEVELOPMENT USING ANDROID

Theory — Credits: 3 — 3 hrs/week

COURSE OBJECTIVES:

1. To facilitate students understanding android SDK
2. To help students to gain a basic understanding of Android application development
3. To instill working knowledge of Android Studio development tool

COURSE OUT COMES:

The theory, practical experiences and relevant of skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry-oriented COs associated with the above-mentioned competency:

1. Identify various concepts and features of Android operating system.
2. Configure Android environment and development tools.
3. Develop rich user Interfaces by using layouts and controls.
4. Use User Interface components for android application development.
5. Create Android application using database.
6. Publish Android applications.

UNIT-I

Introduction to Android: - Features of Android, The Android Platform, Understanding the Android Software Stack – Android Application Architecture –The Android Application Life Cycle – Creating Android Activity -Views- Layout Android SDK, Android Installation, Building you First Android application,

UNIT-II

Android Application Design Essentials: Android terminologies, Creating User Interfaces with basic views- Application Context, Activities, Services, Intents, linking activities with Intents,, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.

UNIT-III

Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation. Layouts, Recycler View, List View, Grid View and Web view

Input Controls: Buttons, Check boxes, Radio Buttons, Toggle Buttons, Spinners, Input Events, Menus, Toast, Dialogs, Styles and Themes, Creating lists, and Custom lists

UNIT-IV

Testing Android applications: Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

UNIT-V

Using Common Android APIs: Internal Storage, External Storage, SQLite Data bases, Managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Deploying Android Application to the World. Google maps, Using GPS to find current location.

REFERENCE BOOKS:

1. RetoMeier,"ProfessionalAndroid2ApplicationDevelopment",WileyIndiaPvtLtd
2. Mark LMurphy, "Beginning Android", Wiley India PvtLtd
3. "Android Application Development Allin one for Dummies "by Barry Burd, Edition:I
4. "Android",Dixit,PrasannaKumarVikasPublications,NewDelhi2014, ISBN: 9789325977884
5. MacleanDavid,KomatineniSatya,AllenGrant,"ProAndroid5",ApressPublications2015 ISBN: 978-1-4302-4680-0
6. "AndroidProgrammingforBeginners"byHortan,John,PacketPublication,2015 ISBN: 978-1-78588-326-2
7. LaurenDarceyandShaneConder,"AndroidWirelessApplicationDevelopment",Pearson Education,2nded. (2011)

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ONLINE READING/SUPPORTING MATERIAL:

1. http://www.developer.android.com
2. http://developer.android.com/about/versions/index.html
3. http://developer.android.com/training/basics/firstapp/index.html
4. http://docs.oracle.com/javase/tutorial/index.htm(Availableintheformoffreedownloadable ebooks also).
5. http://developer.android.com/guide/components/activities.html
6. http://developer.android.com/guide/components/fundamentals.html
7. http://developer.android.com/guide/components/intents-filters.html.
8. http://developer.android.com/training/multiscreen/screensizes.htmlSyllabusofBCA(Honours) under CBCS 33 9. http://developer.android.com/guide/topics/ui/controls.html
10. http://developer.android.com/guide/topics/ui/declaring-layout.html
11. http://developer.android.com/training/basics/data-storage/databases.html

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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-11: MOBILE APPLICATION DEVELOPMENT USING ANDROID

Time: 3 Hours | Max.Marks: 60

Answer any five questions choosing at least two questions from Sections I & II

Section – I **(5X8=40Marks)**

1. Explain Android Architecture.
2. Discuss Android SDK.
3. Explain creating User Interfaces with basic views.
4. Write notes on Android Application Activities & Services.
5. Describe Android Manifest file in detail.

Section – II

6. Describe various Layouts.
7. Explain types of Buttons.
8. Discuss Publishing Android application.
9. Explain managing Application Resources.
10. Discuss common Android APIs.

Section – III **(5X4=20Marks)**

Answer any five questions from the following.

11. Write notes on features of Android.
12. Explain Android Application Life Cycle.
13. Explain Application Intents.
14. Briefly explain different Views.
15. Explain creating Lists.
16. Explain Application Resources.
17. Explain SQLite Database.
18. Write notes on Google Maps.

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MAJOR COURSE-11: MOBILE APPLICATION DEVELOPMENT USING ANDROID LAB

Practical | Credits:1 | 2 hrs/week

LIST OF EXPERIMENTS:

1. Develop a program to implement frame layout, table layout and relative layout.
2. Develop a program to implement Text View and Edit Text.
3. Develop a program to implement Auto Complete Text View.
4. Develop a program to implement Button, Image Button and Toggle Button.
5. Develop a program to implement login windowusingaboveU1 controls.
6. Develop a program to implement Check box.
7. Develop a program to implement Radio Button and Radio Group.
8. Develop a program to implement Progress Bar.
9. Develop a program to implement List View, Grid View, Image View and Scroll View.
10. Develop a program to implement Custom Toast Alert.
11. Develop a program to implement Date and Time Picker.
12. Develop a program to create an activity. Develop a program to implement new activity using explicit intent and implicit intent.
13. Develop a program to implement content provider.
14. Develop a program to implement service.
15. Develop a program to implement broad cast receiver.
16. Develop a program to implement sensors.
17. Develop a program to build Camera.
18. Develop a program for providing Bluetooth connectivity.
19. Perform CRUD operations using SQLite.
20. Develop a program for JSON parsing.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MINOR COURSE-3: MARKETING MANAGEMENT
(BCA Minor 3 / BBA Major 9)

Theory | Credits: 3 | 3 hrs/week

Course Objectives:

- To give an over view of marketing environment.
- To interpret the link between strategic planning and marketing.
- To develop a detailed marketing plan.
- To understand role of intermediaries in marketing activities.
- To acquire knowledge on various promotional tools in marketing.

UNIT-I: INTRODUCTION TO MARKETING MANAGEMENT

Definition, Importance and Scope of Marketing. Core Concepts of Marketing-Production Concept, Product Concept, Selling Concept, Marketing Concept., Selling Vs Marketing, Marketing Management Process , Elements of Marketing Mix, Marketing environment.

UNIT-II:SEGMENTATION,TARGETINGAND POSITIONING

Need for Market segmentation ,Bases of Market Segmentation, criteria of effective markets segmentation - Targeting Strategies ,Positioning strategies.

UNIT-III: PRODUCT

Classification of Products – Consumer goods – Industrial goods.NewProductDevelopmentprocess,ProductLifeCycle–StagesinPLCandapplicationtomarketing.Product Mix and Product Lines- Branding of Products, Packaging, Labeling ,Warranties & Guarantees.

UNIT-IV:PRICING AND DISTRIBUTION

Pricing–Factorsinfluencingpricingdecisions,objectivesofpricing.Pricingpoliciesandmethods,

Physical Distribution- Importance, various types of Marketing Channels, criteriaof selecting a channel.

UNIT-V: PROMOTION

Integrated Marketing Communication, Process of IMC. Elements of Promotional Mix-Advertising, Publicity, Public Relations, Personal Selling, and Sales promotion. Significance of Promotional Mix in marketing decisions.

Reference Books:

1. Kotler.P,&Keller.K.L.,Koshy&Jha(2020).MarketingManagement,20thedition,Pearson.
2. Ramaswamy&Nmakumary-MarketingManagement-GlobalPerspective-IndianContext-MacMillonIndiaLtd.
3. Saxena, Rajan, Marketing Management, Tata-Mc Graw Hill, NewDelhi.
4. S.A.Sherlekar,R.Krishnamoorthy,MarketingManagement,HimalayaPublishingHouse

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MINOR COURSE-3: MARKETINGMANAGEMENT
(BCA Minor 3 / BBA Major 9)

Time: 3 Hours | Max.Marks: 60

PART-I

Answer any FIVE questions from the following. **5X4=20M**

1. Selling Vs. Marketing
2. Market Segmentation
3. Product Branding
4. Objectives of Pricing
5. Promotion Mix
6. Product Life Cycle
7. Classification of Channels
8. Publicity

PART–II

Answer any **FIVE** of the following by selecting at least **TWO** from each Section **5X8=40M**

SECTION-A

9. Define Market, Marketing and Marketing Management. Explain the importance of Marketing .
10. What is Market Segmentation? Explain the bases of Market Segmentation.
11. Explain the steps in the developing of New products.
12. Describe Various methods of pricing?
13. Analyse the elements of Promotion Mix.

SECTION-B

14. Explain the concepts of Marketing.
15. Explain the targeting Strategies.
16. Describe the phases of Product Life Cycle.
17. Analyse the criteria for selecting Marketing channels.
18. Discuss various types of Advertising.

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MINOR COURSE-4: HUMAN RESOURCEMANAGEMENT

(BCA Minor 4 / BBA Major 10)

Theory | Credits: 3 | 3 hrs/week

Course Objectives:

- To understand the significance of human resource management and role of HR Executives.
- To acquire knowledge on procurement and development functions.
- To understand the sources of recruitment and the stages in selection process.
- To gain knowledge on training and development methods.
- To understand the concept of Industrial relations and its impact on HRM.

Unit-I: Introduction to Human Resource Management:

Introduction, Concept of Human Resource Management, Scope of Human Resource Management, Evolution of Human Resource Management, Personnel Management Vs. HRM; Functions of Human Resource Management,

Unit-II: Acquisition of Human Resource:

Concept of Human Resource Planning; Process of HR Planning, Job Analysis, Job Description, and Job Specification. Concept of Recruitment, Source of Recruitment; Meaning of Selection, Steps in Selection Process; Placement and Induction of new candidates.

Unit-III: Training and Development:

Meaning and importance of Training, Methods of Training, Evaluation of Training Effectiveness; Concept of Executive Development, Techniques of Executive Development Programmes, Career Planning and Development.

Unit-IV: Job Evaluation and Compensation:

Concept of Job Evaluation; Methods of Job Evaluation; Concept and Importance of Performance Appraisal, Methods of Performance Appraisal; Concept of Compensation Management, Objectives and Components of Compensation, Wage Fixation Methods, Wage Payment Methods.

Unit-V: Industrial Relations:

Definition and Importance of Industrial Relations, Employees Participation in Management; Collective Bargaining, Types of Collective Bargaining, Process of Collective Bargaining; Introduction to International Human Resource Management.

References:

1. P. Jyothi &D.N.Venkatesh, HRM, Oxford University Press, NewDelhi.
2. BiswajeetPattanayak, Human Resource Management, Prentice-Hall of India, New Delhi.
3. P.Subba Rao, Human Resource Management, Himalaya Publishing House, Mumbai.
4. D'Cenzo, David A., Stephen P. Robbins, and Susan L. Verhulst, Human Resource Management, John Wiley and Sons, New Delhi.
5. Dessler, Garry, Human Resource Management, Prentice Hall of India. Department of Commerce, University of Delhi 20

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(w.e.f. 2023-24 Admitted Batch)

MINOR COURSE-4: HUMAN RESOURCEMANAGEMENT

(BCA Minor 4 / BBA Major 10)

Time: 3 Hours | Max.Marks: 60

PART-I

Answer any FIVE questions from the following. **5X4=20M**

1. Define the term Human Resource
2. Personnel Management Vs. HRM
3. Job Analysis
4. Induction
5. Training and Development means
6. Career Planning
7. Components of the Compensation
8. Employees Participation in Mgt.

PART–II

Answer any FIVE of the following by selecting at least TWO from each Section **5X8=40M**

SECTION-A

9. Explain briefly the objectives and functions of Human Resource Management?
10. Explain the process of HR Planning?
11. What is the role of training in the organization. Write various methods of training?
12. Explain the procedure for evaluating Employee Performance? Analyze the various methods of Performance Appraisal?
13. Define Industrial Relations and describe the Importance of the IR?

SECTION-B

14. Explain briefly the significance of Human Resource Management
15. Enumerate the various Selection Methods
16. What is Management Development? Explain the techniques of Management Development Programmes?
17. Define Compensation? What are the methods of Wage & Salary Fixations?
18. What are the conditions required for the success of Collective Bargaining.

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B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

Skill Enhancement Courses (SECs) for Semester -V

S. No.	Paper Code	Subject	Hours per week	Credits	Max. Marks		Total Marks
					Internal	External (University Exams)	
1	SEC-1	Machine Learning Using Python	4	4	25	75	100
	SEC-1P(Lab)	Python Lab	2	1	--	50	50
2	SEC-2	Digital Imaging	4	4	25	75	100
	SEC-2P(Lab)	Digital Imaging Lab	2	1	--	50	50
3	SEC-3	Cyber Security and Malware Analysis	4	4	25	75	100
	SEC-3P(Lab)	Cyber Security and Malware Analysis Lab	2	1	--	50	50
4	SEC-4	Internet of Things	4	4	25	75	100
	SEC-4P(Lab)	Internet of Things Lab	2	1	--	50	50
5	SEC-5	Mobile Application Development	4	4	25	75	100
	SEC-5P(Lab)	Mobile Application Development Lab	2	1	--	50	50
6	SEC-6	PC Hardware And Networking	4	4	25	75	100
	SEC-6P(Lab)	Computer Networking and PC trouble shooting Labs	2	1	--	50	50
TOTAL			36	30	150	750	900

Note: *Course type code: T: Theory, L: Lab, P: Problem solving

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Note: FIRST and SECOND PHASES (2 spells) of APPRENTICESHIP between 1st and 2nd year and between2nd and 3rd year (two summer vacations)

***Note**: THIRD PHASE of APPRENTICESHIP Entire 5th / 6th Semester

Note-1: The Number of hours per week and credits are assigned to each course as per the course structure which was already approved at the time of finalizing the first FOUR semesters of BCA programme under CBCS by the concerned committee.

Note-2: One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate practical skills related to the domain subject in students. The syllabus of SEC will be skill oriented and hence, teachers shall impart practical training to students on the skills embedded in syllabus citing related real field situations.

Note-3: Since, the proposed SECs are connected to Computer Programming/Software Tools and Skill enhancement, the students need to get exposure on the syllabus content by practicing on the computer. Faculty are advised to engage students in practical based assignments so as to ensure better understanding of the practical usage of the particular skill based subject in real application domain.

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B.C.A III Year SEMESTER-V

(w.e.f. 2023-24 Admitted Batch)

BCA	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 6A	Machine Learning Using Python	Hrs/Wk:4

Course Educational Objective: The objective of the course provides the basic concepts and techniques of Machine Learning and helps to use recent machine learning software for solving practical problems. It enables students to gain experience by doing independent study and research.

Course Outcomes: At the end of this course, the student will be able to

CO1: Identify the characteristics of machine learning.**(Understand- L2)**

CO2: Summarize the Model building and evaluation approaches**(Understand- L2)**

CO3: Apply Bayesian learning and regression algorithms for real-world Problems.**(Apply-L3)**

CO4: Apply supervised learning algorithms to solve the real-world Problems. **(Apply- L3)**

CO5: Apply unsupervised learning algorithms for the real world data. **(Apply- L3)**

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B.C.A III Year SEMESTER-V
(w.e.f. 2023-24 Admitted Batch)

PAPER SEC-1: MACHINE LEARNING USING PYTHON

UNIT-I: Introduction to Machine Learning and Preparing to Model

Introduction to Machine Learning-Introduction, What is Human Learning? Types of Human Learning, What is Machine Learning? Types of Machine Learning, Problems Not To Be Solved Using Machine Learning, Applications of Machine Learning.

Preparing to Model-Introduction, Machine Learning Activities, Basic Types of Data in Machine Learning, Exploring Structure of Data, Data Quality and Remediation, Data Pre- Processing.

UNIT-2: Modeling & Evaluation, Basics of Feature Engineering

Modeling & Evaluation-Introduction, Selecting a Model, Training a Model (for Supervised Learning), Model Representation and Interpretability, Evaluating Performance of a Model.

Basics of Feature Engineering-Introduction, Feature Transformation, Feature Subset Selection.

UNIT-3: Bayesian Concept Learning and Regression

Bayesian Concept Learning - Introduction, Why Bayesian Methods are Important?, Bayes' Theorem, Bayes' Theorem and Concept Learning, Bayesian Belief Network.

Regression: Introduction, Regression Algorithms - Simple linear regression, Multiple linear regression, Polynomial Regression Model, Logistic Regression, Maximum Likelihood Estimation.

UNIT-4: Supervised Learning: Classification, Ensemble Learning

Classification-Introduction, Example of Supervised Learning, Classification Model, Classification Learning Steps, Common Classification Algorithms - k-Nearest Neighbour (kNN), Decision tree, Random forest model, Support vector machines.

Ensemble Learning- Boosting, Bagging

UNIT-5: Unsupervised learning

Unsupervised Learning- Introduction, Unsupervised vs Supervised Learning, Application of Unsupervised Learning, Clustering –Clustering as a Machine Learning task, Different types of clustering techniques, Partitioning methods, Hierarchical clustering, Density-based methods: DBSCAN.

Finding Pattern using Association Rule - Definition of common terms, Association rule, Apriori algorithm.

Text Books:

1. Subramanian Chandramouli, SaikatDutt, Amit Kumar Das, "Machine Learning",Pearson Education India ,1st edition.
2. Tom M. Mitchell, "Machine Learning', MGH, 1997.

Reference Books:

1. Shai Shalev-Shwartz, ShaiBen David, "Understanding Machine Learning: From Theory to Algorithms", Cambridge.
2. Peter Harington, "Machine Learning in Action" , Cengage, 1st edition, 2012.
3. Peter Flach, "Machine Learning: The art and science of algorithms that make sense of data", Cambridge university press,2012.
4. Jason Brownlee, "Machine Learning Mastery with Python Understand Your Data, Create Accurate Models and Work Projects End-To-End",Edition: v1.4, 2011.

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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-A)	2(Section-C)
II	3(Section-A)	1(Section-C)
III	2(Section-B)	2(Section-C)
IV	1(Section-B)	2(Section-C)
V	2(Section-B)	1(Section-C)

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B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

PAPER SEC-1: MACHINE LEARNING USING PYTHON

Time: 3 hours

Max Marks: 75M

PART-I

Answer any Five Questions from Section-A and Section-B taking at least two from each section.

(5 X 10 = 50M)

SECTION – A

1. What is Machine Learning? Explain about types of Machine Learning.
2. Explain the Basic Data Types in Machine Learning.
3. What is Modeling? Explain about Model Representation and Interpretability.
4. Explain about Evaluating Performance of a Model.
5. Explain about Feature Transformation

SECTION-B

6. Explain about Bayes' Theorem.
7. Explain about Polynomial Regression Model.
8. Explain about Classification Model
9. Explain Different types of Clustering techniques.
10. Explain Apriori algorithm

Part-II

SECTION – C

Answer any Five Questions.

(5X5=25M)

11. Write about Types of Human Learning.
12. Write a short note on Machine Learning Activities.
13. Write a short note on Feature Subset Selection.
14. Write a short note on Bayesian Belief Network.
15. Write a short note on Simple linear regression.
16. Write about Decision tree.
17. Write a short note on Support Vector Machine.

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18. Differentiate Unsupervised and Supervised Learning.

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B.C.A III Year SEMESTER-V

(w.e.f. 2021 Admitted Batch

PAPER SEC-1P: MACHINE LEARNING USING PYTHON LAB

B.C.A	Semester – V (Skill Enhancement Course-Elective)	Credits:1
Course: 6A	Machine Learning Using Python Lab	Hrs/Wk:2

1. EDA Analysis
2. Exploring Feature Selection Algorithms
   - Ranking
   - Wrapper methods
3. Dimensionality Reduction-PCA
4. Exploring Model Evolution Parameters.
5. Probabilistic Classification Algorithm
6. Regression Techniques: Linear, Logistic
7. Classification Techniques – Tree Based
8. Classification Techniques- Neural Network.
9. Ensemble Learning
10. Clustering &Apriori Algorithm.

*****

PRACTICAL BREAK UP OF MARKS:

1. Procedure/Steps -	10 Marks
2. Execution -	20 Marks
3. Practical Record -	10 Marks
4. Viva -	10 Marks
Total	50 Marks

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

(w.e.f. 2021 Admitted Batch)

PAPER SEC-2: DIGITAL IMAGING

BCA	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 7A	Digital Imaging	Hrs/Wk:4

Course Objective:

Learn about different types of images and how to use basic and advanced features of GIMPSoftware for creating and image editing tools.

Course Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Gain knowledge about Types of Graphics, Types of Objects, Types of video editing tools
2. Show their skills in editing and altering photographs for through abasic understanding of the tool box.
3. Gain knowledge in using the layers.
4. Gain knowledge in using the selection tools, repair tools.
5. Gain knowledge in using selection tools , applying filters and can show their skills.

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B.C.A III Year SEMESTER-V

(w.e.f. 2021 Admitted Batch)

PAPER SEC-2: DIGITAL IMAGING

UNIT-I

Types of Graphics, Raster vs Vector Graphics, Types of Object, Audio formats, Video formats, Image formats, Text document formats, Types of video editing, Different color modes., Image Scanner, Types of Image Scanners

UNIT-II

What is GIMP, GIMP tool box window, layers Dialog, Tool Options Dialog ,Image window,Image window menus

UNIT-III

Improving Digital Photos

Opening files, rescaling saving files ,Cropping, Brightening & Darkening, Rotating, Sharpening, Fixing Red Eye

Introduction to layers

What is layer, Using layer to add text, Using move tool, Changing colors, Simple effects on layers, Linking layers together, Performing operations on layers,Using layers to copy and paste, Tour of layers dialog

UNIT-IV

Drawing:

Drawing lines and curves, Changing colors and brushes, Erasing, Drawing rectangles, Circles, other shapes, Outlining and filling regions, Filling with patterns and gradients, Importing brushes or gradients or making your own.

Selection:

Working with selections, Select by color and fuzzy, Select Bezier paths, Intelligent scissors tool, Modifying selections with selection modes Dodge and burn tool

UNIT-V

Erasing and Touching Up:

Smudging tool, Clone tool, Sharpening using convolve tool, Blurring with Gaussian Blur, Correcting Color Balance, Hue, Saturation, Color balance using curves and levels.

Filters:

Filters, Blur, Enhance, Distort, Noise Filters

Text Book: Beginning GIMP From Novice to professional by Akkana Peck, Second Edition,Apress

Recommended Co-Curricular Activities (participation: total 15 weeks):

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))

Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))

3. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion
2. Others

Recommended Continuous Assessment Methods:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,

4. Observation of practical skills,
5. Efficient delivery using seminar presentations,
6. Viva voce interviews.
7. Computerized adaptive testing, literature surveys and evaluations,
8. Peers and self-assessment, outputs form individual and collaborative work

GUIDELINES TO THE PAPER SETTER

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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-A)	2(Section-C)
II	3(Section-A)	1(Section-C)
III	2(Section-B)	2(Section-C)
IV	1(Section-B)	2(Section-C)
V	2(Section-B)	1(Section-C)

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

(w.e.f. 2021 Admitted Batch)

PAPER SEC-2: DIGITAL IMAGING

Time: 3 hours **Max Marks: 75M**

PART-I

Answer any Five Questions from Section-A and Section-B taking at least two from each section. **(5 X 10 = 50M)**

SECTION – A

1. Explain about Raster and Vector Graphics.
2. Explain various Types of Image Scanners.
3. Explain about GIMP tool box window.
4. Explain the role of Layers Dialog in images.
5. Explain about Image window menus

SECTION – B

6. Briefly explain the techniques for Improving Digital Photos.
7. What is layer? Explain the operations performing on layers.
8. Explain the tools for drawing lines, curves, changing colors and brushes & Erasing.
9. Explain about Smudging tool and Clone tool.
10. Explain about Color balance using curves and levels.

PART-II

SECTION – C

Answer any Five Questions. **(5X5=25M)**

11. Write about Image formats.
12. Write about Types of video editing.
13. Write about Image window.
14. How to add text using layer?
15. How to perform Copy and Paste using layers.
16. Write about Outlining and filling regions.

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17. Write a short note for working with selections.
18. Write about Blurring with Gaussian Blur.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

(w.e.f. 2021 Admitted Batch)

PAPER SEC-2P: DIGITAL IMAGING LAB

B.C.A	Semester – V (Skill Enhancement Course-Elective)	Credits:1
Course: 7A	Digital Imaging Lab	Hrs/Wk:2

1. Designing a Visiting card
2. Design Cover page of a book
3. Paper add for calling tenders
4. Passport photo design
5. Design a Pamphlet
6. Brochure designing
7. Titles designing
8. Custom shapes creation
9. Black & white and color photo conversion
10. Image size modification
11. Background changes
12. Texture and patterns designing
13. Filter effects & Eraser effects

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PRACTICAL BREAK UP OF MARKS:

1. Procedure/Steps -	10 Marks
2. Execution -	20 Marks
3. Practical Record -	10 Marks
4. Viva -	10 Marks

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Total 50 Marks

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

(w.e.f. 2021 Admitted Batch)

PAPER SEC-3: CYBER SECURITY AND MALWARE ANALYSIS

BCA	**Semester – V (Skill Enhancement Course- Elective)**	**Credits:4**
Course: 6B	**Cyber Security And Malware Analysis**	**Hrs/Wk:4**

COURSE OBJECTIVES:

The main objective of the course is to impart conceptual understanding on Cyber security and protectionof electronic systems and information from malware attacks.

COURSE OUTCOMES:

Upon successful completion of this course, students should have the knowledge and skills to

1. Understand the computer networks, networking tools and cyber security
2. Learn about NIST Cyber Security Framework
3. Understand the OWASP Vulnerabilities
4. Implement various Malware analysis tools
5. Understand about Information Technology act 2000

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PAPER SEC-3: CYBER SECURITY AND MALWARE ANALYSIS

UNIT-I: Introduction to Networks & cyber security

Computer Network Basics, Computer network types, OSI Reference model, TCP/IP Protocol suite, Difference between OSI and TCP/IP, What is cyber, cyber-crime and cyber-security, All Layer wise attacks, Networking devices: router, bridge, switch, server, firewall, How to configure: router, How to create LAN, Network tools:, IP scanner, port scanner, vulnerability scanner, command tools--netstack, traceroute, nslookup, tcpview

UNIT-II: NIST Cyber security framework

Introduction to the components of the framework, Cyber security Framework Tiers, What is NIST Cyber security framework, Features of NIST Cyber security framework, Functions of NIST Cyber security framework, Turn the NIST Cyber security Framework into Reality/ implementing the framework

UNIT-III: OWASP

What is OWASP? , OWASP Top 10 Vulnerabilities: ,Injection, Broken Authentication, Sensitive Data Exposure, XML External Entities (XXE), Broken Access Control, Security Misconfiguration, Cross-Site Scripting (XSS), Insecure Deserialization, Using Components with Known Vulnerabilities, Insufficient Logging and Monitoring, **OWASP Juice Shop, Web application firewall**

UNIT-IV: MALWARE ANALYSIS

What is malware, Types of malware, Keyloggers, Trojans, Ransome ware, Rootkits, Antivirus, Firewalls, Malware analysis, VM ware, How to use sandbox, How to create virtual machine, Process explorer, Process monitor,SYS-internals Suite, SOC-security operations controls - Solar winds (study the tools), Network intrusion detection, Wireshark, IDS, IPS, Snort

UNIT-V: CYBER SECURITY: Legal Perspectives

Cybercrime and the legal landscape around the world, Indian IT ACT 2000 --Cybercrime and Punishments, Weak areas of IT ACT 2000, Challenges to Indian law and cybercrime scenario in India,Amendments of the Indian IT Act

Text books:

1. Computer Networks | Fifth Edition | By Pearson (6th Edition)|Tanenbaum, Feamster&Wetherall
2. Computer Networking | A Top-Down Approach | Sixth Edition | By Pearson | Kurose James F. Ross Keith W.
3. Cyber Security by SunitBelapure, Nina Godbole|Wiley Publications
4. TCP/IP Protocol Suite |Mcgraw-hill| Forouzan|Fourth Edition

Website References:

https://csrc.nist.gov/Projects/cybersecurity-framework/nist-cybersecurity-framework-a-quick-start-guide
https://owasp.org/www-project-top-ten/
https://owasp.org/www-project-juice-shop/

Co-Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)

2. Student seminars (on topics of the syllabus and related aspects (individual activity))

3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))

4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

B. General

1. Group Discussion
2. Try to solve MCQ's available online.

Recommended Continuous Assessment Methods:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Practical assignments and laboratory reports,
4. Observation of practical skills,
5. Individual and group project reports.
6. Efficient delivery using seminar presentations,
7. Viva-Voce interviews.
8. Computerized adaptive testing, literature surveys and evaluations,
9. Peers and self-assessment, outputs form individual and collaborative work

GUIDELINES TO THE PAPER SETTER

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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-A)	2(Section-C)
II	3(Section-A)	1(Section-C)
III	2(Section-B)	2(Section-C)
IV	1(Section-B)	2(Section-C)
V	2(Section-B)	1(Section-C)

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B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

PAPER SEC-3: CYBER SECURITY AND MALWARE ANALYSIS

Time: 3 hours **Max Marks: 75M**

PART-I

Answer any Five Questions from Section-A and Section-B taking at least two from each section. **(5 X 10 = 50M)**

SECTION – A

1. Explain the OSI Reference Model.
2. Discuss various Network Devices.
3. Explain about Cyber Security Framework Tiers.
4. Discuss about the Functions of NIST Cyber Security Framework.
5. Explain the procedure to turn the NIST Cybersecurity Framework into Reality/ implementing the Framework.

SECTION – B

6. Explain the concepts Broken Authentication and Sensitive Data Exposure.
7. Explain about Web Application Firewall.
8. Discuss about types of Malware.
9. Explain about Cybercrime and Punishments.
10. Discuss about Challenges to Indian law and Cybercrime Scenario in India.

Part-II

SECTION – C

Answer any Five Questions. **(5X5=25M)**

11. Write about types Computer Network.
12. Write a short note on Cyber, Cyber-Crime and Cyber-Security.
13. Write about the Components of the framework.
14. Write about Security MisConfiguration.
15. Write about Insufficient Logging and Monitoring.
16. Write about Antivirus.
17. Write a short note on Network intrusion detection.
18. Write a short note on Cybercrime Scenario in India.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

PAPER SEC-3P: CYBER SECURITY AND MALWARE ANALYSIS LAB

B.C.A	Semester – V (Skill Enhancement Course-Elective)	Credits:1
Course: 6B	Cyber Security And Malware Analysis Lab	Hrs/Wk:2

COURSE OBJECTIVES:

The purpose of this course is to impart practical understanding on Cyber security and protectionof electronic systems and information from malware attacks.

1. configure a LAN by using a switch
2. configure a LAN by using Router
3. steps to attack a victim computer by using "ProRat" trojan tool
4. Perform the packet sniffing mechanism by download the "wireshark" tool and extract thepackets
5. Perform the task of creating mail messages by using fake mail id by using the "fake mailer" website (https://emkei.cz)
6. Perform the IP scanning mechanism by using "tracert"and "arp" commands
7. Perform the port scanning mechanism by using NMAP tool
8. Perform an SQL Injection attack and its preventive measure to avoid Injection attack
9. Perform an activity to access a locked computer without knowing the user's password.

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PRACTICAL BREAK UP OF MARKS:

1. Procedure/Steps -	10 Marks
2. Execution -	20 Marks
3. Practical Record -	10 Marks
4. Viva -	10 Marks
Total	50 Marks

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

PAPER SEC-4: INTERNET OF THINGS

BCA	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 7B	Internet Of Things	Hrs/Wk:4

Course description and objectives:

Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop communication system among heterogeneous components i.e. IOT Devices.

Course Outcomes:

* Able to understand various applications of IOT in real world and industry domain.
* Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks.
* Able to understand building blocks of Internet of Things and characteristics.
* Able to design and develop IOT devices.

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B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

PAPER SEC-4: INTERNET OF THINGS

UNIT-1

IOT. Explain Characteristics and component of IOT., Advantages and disadvantages of IOT., various application areas of IoT., Time for Convergence for IoT., reasons to converge the technologies and shift to IOT., smart parking IOT application using figure., smart home IOT application using figure., smart health using IoT., Smart City application of IoT

UNIT-2

M2M Value Chains., IoT architecture outline withdiagram., IOT Value Chains using figure., shifting from M2M to IoT., design principles and needed capabilities of IOT, I-GVC using figure., Global Value Chain, M2M Value Chains., IoT-Architecture.

UNIT 3:

ETSI M2M high-level architecture., IOT referencemodel., IOT function view.,IOT reference architecture's deployment and operational view., reference architecture of IOT using figure., Functional View, Information View, Deployment and Operational View, Other Relevant architectural views of IOT reference architecture., Architecture Reference Model of IOT using figure., IoT Domain Model, Open Geospatial Consortium Architecture with a diagram.

UNIT 4

Shopping basket can tell: IoT for retailing industry?, future factory concepts.,four aspects in your business to master IoT, Needs of IoT for Oil and Gas Industry., creation from big data and serialization, challenges faced by industry related IoT Applications, four Aspects in one's business to master IoT, eHealth IOT applications, security concerns for industry.shopping basket can tell: IoT for retailing industry, future factory concepts, IoT for Oil and Gas Industry, Smart factory.

UNIT 5

GAMBAS adaptive middleware, smartie approach for IoT., security, privacy and trust in IoT-Data-Platforms for smart cities, Data aggregation for the IoT in smart cities security., contributions from FP7Projects., smartie approach, properties and characteristics.privacy-preserving sharing of IoT Data., activity chain - governance, privacy and security issues.

Co-Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shallencourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside thesyllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals orgroups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

B. General

1. Group Discussion
2. Try to solve MCQ's available online.

Recommended Continuous Assessment Methods:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Practical assignments and laboratory reports,
4. Observation of practical skills,
5. Individual and group project reports.
6. Efficient delivery using seminar presentations,
7. Viva-Voce interviews.
8. Computerized adaptive testing, literature surveys and evaluations,
9. Peers and self-assessment, outputs form individual and collaborative work.

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Unit No.	Essay Questions	Short Answer Questions
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PAPER SEC-4: INTERNET OF THINGS

Time: 3 hours Max Marks: 75M

PART-I

Answer any Five Questions from Section-A and Section-B taking atleast two from each section. (5 X 10 = 50M)

SECTION – A

1. Explain the Characteristics and Components of IOT.
2. Explain various Application Areas of IOT.
3. Explain the IOT architecture.
4. Discuss the Design Principles and Needed Capabilities of IOT.
5. Explain about Global Value Chain.

SECTION – B

6. Explain about IOT Reference Model.
7. Explain about IOT Function View.
8. Explain the challenges faced by industry related IoT Applications.
9. Explain about GAMBAS adaptive middleware
10. Explain Data Aggregation for the IoT in Smart Cities Security.

Part-II

SECTION – C

Answer any Five Questions. (5X5=25M)

11. Write about Advantages and disadvantages of IOT.
12. Write a short note on Smart Health using IoT.
13. Write a short note on M2M Value Chains.
14. Write about Operational View of IOT.
15. Write a short note on IoT Domain Model.
16. Write about the Security Concerns for industry
17. Write about the Needs of IoT for Oil and Gas Industry
18. Write a short note on Security, Privacy and Trust in IoT.

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PAPER SEC-4P: INTERNET OF THINGS LAB

B.C.A	Semester – V (Skill Enhancement Course-Elective)	Credits:1
Course: 7B	Internet Of Things Lab	Hrs/Wk:2

IoT Lab Experiments:

1. Define and Explain Eclipse IoT Project
2. List and summarize few Eclipse IoT Projects.
3. Sketch the architecture of IoT Toolkit and explain each entity in brief.
4. Demonstrate a smart object API gateway service reference implementation in IoT toolkit.
5. Write and explain working of an HTTP-to-CoAP semantic mapping proxy in IoT toolkit
6. Describe gateway-as-a-service deployment in IoT toolkit.
7. Explain application framework and embedded software agents for IoT toolkit.
8. Explain working of Raspberry Pi.
9. Connect Raspberry Pi with your existing system components.
10. Give overview of Zetta.

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PAPER SEC-5: MOBILE APPLICATION DEVELOPMENT

BCA	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 6C	Mobile Application Development	Hrs/Wk:4

Course objectives:

1. Interpret the features of Android operating systems
2. Configure Android Environment and Development tools
3. Develop user interfaces by using layouts an controls
4. Develop rich user interface in the given view
5. Understand the security services and able to publish android application

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

CO 1. Identify basic terms ,tools and software related to android systems

CO 2. Describe components of IDE, understand features of android development tools

CO 3. Describe the layouts and controls

CO 4. Explain the significance of displays using the given view

CO 5. Explain the features of services and able to publish android ApplicationC0 6. Developing interesting Android applications using MIT App Inventor

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

(w.e.f. 2023-24 Admitted Batch)

PAPER SEC-5: MOBILE APPLICATION DEVELOPMENT

UNIT-1

Introduction to Android ,open headset alliance, Android Ecosystem, Need of Android Features of Android, Tools and software required for developing an Application, Android architecture

UNIT-2

operating system, java JDK, Android SDK, Android development tools, Android virtual devices, steps to install and configure Android studio and sdk

UNIT-3

Control flow, directory structure, components of a screen, fundamental UI design, linear layout, absolute layout , table layout, relative layout, text view, edit text, button, image button, radio button, toggle button, radio group, check box, and progress bar,list view , grid view, image view , scroll view, time and date picker

UNIT-4

Android platform services, Android system Architecture, Android Security model, Applications development: creating small application

UNIT-5

Introduction of MIT App Inventor, Application Coding 5.3Programming Basics & Dialog, More Programming Basics, Alarm Clock Application, Audio & Video, Drawing Application, File, Game, Device Location, Web Browsing

Text Books:

1. Erik Hellman, "Android Programming – Pushing the Limits", 1st Edition, Wiley India PvtLtd, 2014.
2. App Inventor : create your own Android apps by Wolber, David (David Wayne)

Reference Books:

1. Dawn Griffiths and David Griffiths, "Head First Android Development", 1stEdition, O'Reilly SPD Publishers, 2015.
2. J F DiMarzio, "Beginning Android Programming with Android Studio", 4thEdition, Wiley India Pvt Ltd, 2016. ISBN-13: 978-8126565580
3. Anubhav Pradhan, Anil V Deshpande, " Composing Mobile Apps" usingAndroid, Wiley 2014, ISBN: 978-81-265-4660-2
4. Android Online Developers Guide
5. http://developer.android.com/reference/ Udacity: Developing Android
6. Apps- Fundamentals
7. https://www.udacity.com/course/developing-android-appsfundamentals--ud853-ndhttp://www.appinventor.mit.edu/

Recommended Co-Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from otherswork and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus contentand outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

Recommended Continuous Assessment Methods:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports.
5. Observation of practical skills,
6. Efficient delivery using seminar presentations,
7. Viva voce interviews.
8. Computerized adaptive testing, literature surveys and evaluations,
9. Peers and self-assessment, outputs form individual and collaborative work

GUIDELINES TO THE PAPER SETTER

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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-A)	2(Section-C)
II	3(Section-A)	1(Section-C)
III	2(Section-B)	2(Section-C)
IV	1(Section-B)	2(Section-C)
V	2(Section-B)	1(Section-C)

APPROVED

K. Padmavathi.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

PAPER SEC-5: MOBILE APPLICATION DEVELOPMEN

Time: 3 hours **Max Marks: 75M**

PART-I

Answer any Five Questions from Section-A and Section-B taking atleast two from each section. **(5 X 10 = 50M)**

SECTION – A

1. Explain Android architecture.
2. Write about Tools and software required for developing an Application.
3. Explain Android development tools.
4. Explain Android virtual devices.
5. Discuss Java JDK and Andriod SDK.

SECTION – B

6. Explain types of Buttons.
7. Describe various Layouts.
8. Explain Android Security model.
9. Explain Audio & Video Applications.
10. Explain Drawing Applications.

Part-II

SECTION – C

Answer any Five Questions. **(5X5=25M)**

11. Explain Features of Android.
12. Explain about Android Ecosystem.
13. Explain Android SDK.
14. Explain about components of a screen.
15. Briefly explain different views.
16. Explain android platform services.
17. Explain Device Location Android Application.
18. Explain Web Browsing.

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K. Jaalmavalli
BOS Chairman

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B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

PAPER SEC-5P: MOBILE APPLICATION DEVELOPMENT LAB

B.C.A	Semester – V (Skill Enhancement Course-Elective)	Credits:1
Course: 6C	Mobile Application Development Lab	Hrs/Wk:2

Course objectives:

1. know the components and structure of mobile application development framework forandroid
2. learn the basic and important design concepts
3. learn the development of mobile application

Outcomes:

1. Understand the android platform
2. Design and implementation of various mobile applications

Experiments:

1. Demonstrate mobile technologies and devices
2. Demonstrate Android platform and applications overview
3. Implement User interface design layouts
4. Working with texts , shapes, buttons and lists
5. Develop a calculator application
6. Implement an application that creates a alarm clock.

Note: The list of experiments need not be restricted to the above list. Detailed list of programming/software tool based exercises can be p

PRACTICAL BREAK UP OF MARKS:

1. Procedure/Steps -	10 Marks
2. Execution -	20 Marks
3. Practical Record -	10 Marks
4. Viva -	10 Marks
Total	50 Marks

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

PAPER SEC-6: PC HARDWARE AND NETWORKING

BCA	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 7C	Pc Hardware And Networking	Hrs/Wk:4

Course objectives: Upon successful completion of the course, a student will be able to: Learning Outcomes:

CO 1. Identify the computer peripherals, software and hardware devices.

CO 2. Describe the basics of networks and networking tools

CO 3. Describe the Network Addressing and sub-netting

CO 4. Explains the Networks protocols and management

CO 5. Identifies Basic Network administrator roles

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PAPER SEC-6: PC HARDWARE AND NETWORKING

UNIT-1: Introduction to computer hardware

Introduction & Definition of Computer Block Diagram of computer, Classification of computer, Characteristics of Computers, Types of Languages and language translators., History and Generation of computers,Memory-Bits, Bytes, KB, MB, GB, TB, PB, EB, ZB, YB, Brontope byte, Geeope Byte. Etc

IEC Units: kibi, mebi, gibi, tebi, pebi, exbi, zebi, yobi, Computer Software, Types of Software with Ex. (System/Application/Utility S/W, Computer Hardware- Intro. to Hardware components of computer, Components and its parts, Identifying the Important Hardware Components of PC.- CPU, Motherboard, RAM,HDD, ODD, SMPS, K/B, Mouse, Monitor (CRT,LCD,LED) etc

SMPS: About SMPS, Types of SMPS, Power stored in UPS, Components and Circuits inside the SMPS Unit,UPS (Uninterrupted Power Supply), Types of UPS (Offline/Line Interactive & Online), Working Principle of each type of UPS., Connecting, Maintenance and Troubleshooting.

UNIT-2: Computer management and servicing

Assembling and dissembling PCs, Introduction to BIOS / CMOS Setup, POST (Power On SelfTest), Introduction to BIOS/CMOS Setup, POST (Power On Self-Test Demonstration of BIOS/CMOS Configuration (Date, Time, Enable/Disable Devices), Dual BIOS Feature, BIOS/CMOS Setup, Booting Sequence/Boot Order

Introduction to Operating System

Definition and types of Operating Systems -MSDos, Windows 9x/XP/Vista/7/8, Linux, MAC OS, Android etc., Process of Booting the Operating System., Win XP/Win 7. Activation and Automatic Updating procedures.

Computer Management

Computer Management, Disk Management, Defragmentation, Services and Applications, local Users and Groups, Advanced System Settings, Device Manager, Task Manager, Windows Registry

Partitioning

Partitioning of Hard Drive - Primary, Extended, Logical partitions using PartitionTools.

UNIT-3: Overview of Networking

Overview of Networking, Classification of Networks–LAN, MAN, WAN, Hardware and Software Components, Wi-Fi, Bluetooth, Network Communication Standards.

NETWORKING MODEL -OSI Reference Model, TCP/IP Reference Model, LAN Cables, Connectors, wireless network adapter,Wireless network adapter, Functions of LAN Tools, Anti-Magnetic mat, Anti-Magnetic Gloves, Crimping Tool, Cable Tester, Cutter, Loop back plug, Toner probe, Punch down tool, Protocol analyzer, Multi meter, Network Topologies, Bus, Ring, Star, Mesh, Hybrid Topologies

UNIT- 4: Network Addressing and sub-netting

Network Addressing, TCP/IP Addressing Scheme, Components of IP Address and classes Sub-netting, Internet Protocol Addressings - IPv4 ,IPv6, Classful addressing and classless addressing

UNIT-5: Networks protocols and management

Protocols in computer networks, Hyper Text Transfer Protocol(HTTP), File Transfer, Protocol(FTP), Simple Mail Transfer Protocol(SMTP)5.2.3address Resolution Protocol(ARP) Reverse Address Resolution Protocol(RARP), Telnet, ICMP, Simple Network Management Protocol(SNMP), DHCP, DNS, Network Management., Network Monitoring and Troubleshooting., Remote Monitoring (RMON)

Text Book:

1. "Introduction to Data Communications and Networking", B. Forouzan,TataMcGrawHill
2. "Computer Networks", Tanenbaum, PHI,
3. PC AND CLONES Hardware, Troubleshooting and Maintenance B. Govinda rajalu,Tata Mc-graw-Hill Publication

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Reference Books:

1. PC Troubleshooting and Repair Stephen J. Bigelow Dream tech Press, New Delhi
2. "Data and Computer Communications", Stallings, PHI,
3. "DataCommunication", William Schewber, McGrawHill,1987
4. IT essential V7 companion guide – Cisco Networking Academy 2020
5. Upgrading and repairing PCs(22nd edition) – Scott Mueller – 2015 Que

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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-A)	2(Section-C)
II	3(Section-A)	1(Section-C)
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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

PAPER SEC-6: PC HARDWARE AND NETWORKING

Time: 3 hours **Max Marks: 75M**

PART-I

Answer any Five Questions from Section-A and Section-B taking atleast two from each section. **(5 X 10 = 50M)**

SECTION – A

1. Explain Classification of computers?
2. Explain about Block Diagram of computer?
3. Define OS. Explain types of Operating Systems.?
4. Explain Computer Management?
5. Explain Partitioning of Hard Drive?

SECTION – B

6. Explain various Network Topologies?
7. Explain OSI Reference Model?
8. Explain IPv4 and IPv6?
9. Explain DNS?
10. Explain Simple Mail Transfer Protocol (SMTP)?

PART-II

SECTION – C

Answer any Five Questions. **(5X5=25M)**

11. Characteristics of Computers?
12. Types of UPS?
13. Explain BIOS?
14. Classification of Networks–LAN, MAN, WAN?
15. Bluetooth?
16. Explain IP Addressing?
17. Explain Sub-netting?
18. HTTP.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V
(w.e.f. 2021 Admitted Batch)

PAPER SEC-6P: PC HARDWARE AND NETWORKING LAB

B.C.A	Semester – V (Skill Enhancement Course-Elective)	Credits:1
Course:7C	Pc Hardware And Networking Lab	Hrs/Wk:2

Course objectives:

To train the officials to acquire basic knowledge in computer hardware and peripherals for installation, PC assembly, trouble shooting and maintenance including system management and its backup and to undertake disaster prevention, a basic knowledge of TCP/IP networks work group, internet and intranet.

Outcomes:

The student will able to know the Basic of Computer assembling and trouble shooting. This course will provide the brief knowledge of Computer networking and trouble shooting

Experiments:

1. Introduction to PC Hardware and its pheripherals
2. Hardware installation and configuration
3. PC Debugging, troubleshooting andbasic preventive maintenance
4. Assembling and Dissembling of a Computer System
5. Preparation of Boot disk or USB drive (demo)
6. Software installation and Configuration with CD/DVD or USB drive
7. Installation of commonly used software (Office Suites, Virus Scanners &Utilities)
8. Printer Installation & Print Test Page (Demo)
9. Installation of Web cam and tools like zoom/Edx/Microsoft teams (optional) foronline class
10. Identifying network componentsand devices (hub, Switch and router)
11. Cables – Coaxial and UTP and it connectors/Jacks and preparation of a patchcord

12. Networking Basic and Configuration
13. Run All Types of Network Troubleshooting Commands(ipconfig, ping, traceroute etc)
14. installation and configuring the proxy server for internet access
15. Exercise on Setting of particular IP address (static) to an existing terminal system
16. Exercise on Installation of network operating system
17. Exercise on Configuration of DHCP and DNS.
18. Exercise on File/Folder accessing rights for sharing and printer sharing
19. Exercise on remote desktop
20. Exercise on setting up of VPN on network
21. Design a network with Cisco Packet tracer 8.0 (freely downloadalbe)

a. Simple network with one server with five desktops (configure static IP addresses)
b. Adding and removing network cards in a PC or server
c. Design a Network with one DHCP server with 5 desktops(Try exercises 13,16 and 17 using Cisco packet tracer)

Tools required for PC assembling and software installation

1. Multimeter - 1Rs 500/ basic version
   or
   Digital voltage tester – 1 Rs 150 (taparia)
2. Earth checking plug – 1 Rs 350 (Mx)
3. Mother board diagnosis card -1 Rs 400/-
4. SMPS power supply tester - 1 Rs 400/-
5. Screw driver kit – 4 Nos Rs 40 each
6. External CD/DVD writer – 1 Rs 2000/-
6. Media for operating system (CD/DVD) or USB drive
   (Try with trial versions for windows) or Ubuntu desktop(Linux)

Note : Un used old desktops can be used for installation.

Tools Required for Network

1. RJ45 crimp tool – 1 Rs 250/- basic model
2. Cable tester - 1 Rs 350/-
3. Rj45 jacks - 100 nos Rs 250(ordinary) - consumables
4. UTP cable - 10 mts for each class Rs 20 per metre – consumables

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A I Year SEMESTER-II

(w.e.f. 2023-24 Admitted Batch)

MINOR -1: OFFICE AUTOMATION TOOLS (BBA Minor-1)

Time:3Hours **Credits: 3** **Max.Marks:60**

UNIT–I : Introduction to Ms-Office &Ms-Word:

MS-Word: Features of MS-Word, MS-Word Window components, working with formatted text, Shortcut keys, Formatting documents: Selecting text, Copying &moving data, Formatting characters, changing cases, Paragraph formatting, Indents, Drop Caps, Using format painter, Page formatting, Header &footer, Bullets & numbering, Tabs, Forming tables. Finding & replacing text, go to (F5) command, proofing text (Spellcheck, Auto correct).

UNIT–II: Ms-Word Advanced Features:

Difference between Wizard and Template - Customize the Quick Access Tool Bar – Macros: Purpose – Creating Macro – Using Macro – Storing Macro - Inserting pictures: From Computer, Online Pictures – Insert 3d Models - Insert Shapes – Insert Text Box – Insert Equation, Hyperlinks- Tables : Insert tables - Mail merge ,Printing documents, Tables : Insert tables, Mathematical calculations on tables data. InsertText Box etc.

UNIT–III: Introduction to Ms-Excel & Its Features:

MS-Excel: Excel Features, Spread sheets, workbooks, creating, saving &editing a workbook, Renaming sheet, cell entries(numbers, labels, and formulas),spell check, find and replace, Adding and deleting rows and columns Filling series, fill with drag, data sort, Formatting worksheet, Functions and its types, Some useful Functions in excel (SUM,AVERAGE,COUNT, MAX,MIN, IF)

UNIT-IV: Ms-Excel AdvancedFeatures:

Cell referencing(Relative,Absolute,Mixed),What-if analysis,

Introduction to charts: Types of charts, creation of charts, printing a chart, printing worksheet – Sort – Filters – View Menu- Goal Seek –Scenarios.

UNIT-V: Ms-PowerPoint and its Applications:

MS-PowerPoint: Features of Power Point, Uses, components of slide, templates and wizards, using template, choosing an auto layout, using outlines, adding subheadings, editing text, formatting text, using master slide, adding slides, changing color scheme, changing background and shading, adding header and footer, adding clip arts and auto shapes. Various presentation, Working with slide sorter view(deleting, duplicating, rearranging slides),adding transition and animations to slide show, inserting music or sound on a slide, viewing slideshow, Printing slides.

Text Books:

1. Computer Fundamentals–Pradeep .K.Sinha: BPB Publications.
2. Fundamentals of Computers –Reema Thareja, Oxford UniversityPress India

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B.C.A I Year SEMESTER-II
(w.e.f. 2023-24 Admitted Batch)

MINOR -1: OFFICE AUTOMATION TOOLS (BBA Minor-1)

Time: 3 Hours **Max.Marks:60**

PART-I

Answer any five questions from the following. **5X4=20M**

1. Write a short note on Formatted Text.
2. Write about how to insert pictures in MS-Word.
3. Write about Cell Entries in MS-Excel.
4. Write about What-if analysis in MS-Excel.
5. Write about Components of Slide in MS-PowerPoint.
6. Write about Headers and Footers.
7. Write about how to create tables in MS-Word.
8. Write about Adding and Deleting Rows in MS-Excel.

PART-II

Answer any Five of the following by selecting at least TWO from each section. 5 X 8 = 40M

SECTION – A

9. What are the features of MS-Word? Explain the Word Window Components.
10. Explain the steps for Mail Merge in MS-Word with an example.
11. Write the features of MS-Excel. Explain how to create a Workbook with an example.
12. Explain Cell Referencing in MS-Excel with an example.
13. Explain working with slide sorter view in MS-Power Point.

SECTION – B

14. Explain the steps to create a Letter in MS-Word with an example.
15. Write a procedure to create Time Table in MS-Word with an example.
16. Explain various Functions in Excel with an example.
17. Explain different types of Charts in MS-Excel.
18. What are the features of MS-PowerPoint? Explain the steps for how to create a Presentation in MS PowerPoint.

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I – YEAR SEMESTER-II
(w.e.f. 2023 Admitted Batch)

COURSE 3: OFFICE AUTOMATION TOOLS(BBA Minor-1)

Practical | Credits: 1 | 2 hrs/week

List of Experiments

1. Design a visiting card for managing director of a company as per the following specification.
   - Sizeofvisitingcardis3½×2
   - Name of the company with big font
   - Phone number, Fax number and E-mail address with appropriate symbols.
   - Office and Residence addresses separated by new line
2. Create a table with following columns and display the result in separate cellsfor the following
   - Emp Name, Basic pay, DA, HRA, Total salary.
   - Sort all the employees in ascending order with the name as the key
   - Calculate the total salary of the employee
   - Calculate the Grand total salary of the employee
   - Find highest salary and
   - Find lowest salary
3. Prepare an advertisement to company requiring software professional with thefollowing
   - Attractive page border
   - Design the name of the company using WordArt
   - Use at least one clipart.
   - Give details of the company(use bullets etc.)
   - Give details of the Vacancies in each category of employee's(Business manager, Software engineers, System administrators, Programmers, Data entry operators)qualification required.
4. Create a letter head of a company with the following specifications
   - Name of the company on the top of the page 2 with big font and good style
   - Phone no, Faxno and E-mail address with symbols.
   - Main products manufactured by the company
   - Slogans if any should be specified in bold at the bottom

5. Create two pages of curriculum vitae of a graduate with the following specifications
   - Table to show qualifications with proper headings
   - Appropriate left and right margins
   - Format ½pageusingtwo-columnapproachabout yourself
   - Name on each page at the top right side
   - Page no. in the footer on the right side.
6. Write a macro format document as below
   - Line spacing"2"(double)
   - Paragraphindentof0.1
   - Justification formatting style
   - Arial font andBoldof14pt-size.
7. Create a letter as the main document and create 10 records for the 10 persons Use mail merge to create letter for selected persons among 10.
8. Create an electronic spread sheet in which you enter the following decimal numbers andconvert the number to octal, Hexadecimal and binary numbers and vice-versa.

   DecimalNumbers:35,68,95,78,165,225,355,375,465

   BinaryNumbers:101,1101,11101,11111,10001,11101111
9. Calculate the net pay of the employees following the conditions below.

	A	B	C	D	E	F	G	H	I
1	Employee Number	Employee Name	Basic pay	DA	HRA	GPF	Gross Pay	Income tax	Net pay
2									

   - **DA:-** 16% of the basic pay if Basic pay is greater than 20000 or else 44%.
   - **HRA:-** 15 % of the Basic pay subject to maximum of Rs.4000.
   - **GPF:** -10% of the basic pay.
   - **INCOMETAX:-**10% of basic If Basic pay is greater than20000.

   Find who is getting highest salary & who is get lowest salary?

10. The ABC Company shows the sales of different product For5years.CreateBARGraph, 3Dand Pie chart for the following.

A	B	C	D	E	F
S.No.	Year	Pro1	Pro2	Pro3	Pro4
1	1989	1000	800	900	1000
2	1990	800	80	500	900
3	1991	1200	190	400	800
4	1992	400	200	300	1000
5	1993	1800	400	400	1200

11. Create a suitable examination database and find the sum of the marks(total) of eachstudent and respective, class secured by the student.

- ✓ **Pass** – if marks in each subject >= 35
- ✓ **Distinction**- if average >= 75
- ✓ **First class** - if average >=60 but <75
- ✓ **Second class** – if average >=50 but l<60
- ✓ **Third class** – if average >=35 but <50
- ✓ **Fail**: if marks in any subject <35

12. Enter the following data in to the sheet.

Name	Department	Salary
Anusha	Accounts	12000
Rani	Engineering	24000
Lakshmi	Accounts	9000
Purnima	Marketing	20000
Bindu	Accounts	4500
Tejaswi	Accounts	11000
Swetha	Engineering	15000
Saroja	Marketing	45000
Sunitha	Accounts	5600
Sandhya	Engineering	24000
Harika	Marketing	8000

- o Extract records for department in Accounts and Salary>10000
- o Sort the data by salary with the department using "sort commands".
- o Calculate total salary for each department using Subtotals

13. Enter the following data into the sheet.

	Raju	Rani	Mark	Rosy	Ismail	Reshma
English	76	89	43	51	76	87
2ndLang	55	85	78	61	47	33
Maths	65	82	34	58	52	65
Computers	45	91	56	72	49	56
Human Values	51	84	54	64	32	64

Apply the conditional formatting for marks

- 35 below Red
- 35 to 50 Blue
- 51 to 70 Green
- 71 to 100 Yellow

14. Create a presentation using templates.

15. Create a Custom layout or Slide Master for professional presentation.

16. Create a presentation with slide transitions and animation effects

17. Create a table in PPT and apply graphical representation unit

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MINOR -2: DATA BASE MANAGEMENT SYSTEM (BBA Minor-2)

Theory | Credits: 3 | 3 hrs/week

Course Objectives:

- Graduateswillhavetheexpertiseinanalyzingrealtimeproblemsandproviding appropriate solutions related to Computer Science & Engineering.
- Graduates will have the knowledge of fundamental principles and innovative technologies to succeed in higher studies and research.
- Graduates will continue to learn and to adapt technology developments combined with deep awareness of ethical responsibilities in profession.

Course Outcomes:

- An ability to apply Knowledge of computing and mathematics in Computer Science & Engineering.
- An ability to analyze a problem, identify and define the computing requirements appropriate to its solution.
- An ability to design, implement and evaluate a computer-based system to meet desired needs with appropriate societal considerations.
- An ability to conduct investigations, interpret data and provide conclusions in investigating complex problems related to Computer Science & Engineering.
- An ability to engage in continuing professional development and life-long learning.

UNIT-I

Overview of Database Systems: Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications.

Data Models: Introduction; types of data models, Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence, Centralized and Client Server architecture for the database.

UNIT-II

Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, constraints (Domain, Key constraints, integrity constraints), concept of keys(super key, candidate key, primary key, surrogate key, foreign key) , relational Algebra & relational calculus.

Normalization: Schema refinement, concept of functional dependency, Normal Forms based on functional dependency(1NF, 2NF and 3 NF),Boyce-codd normal form(BCNF).

UNIT-III

Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, ER Diagram.

BASIC SQL: Database schema, data types, DDL operations (create, alter, drop, rename), DML operations (insert, delete, update), basic SQL querying (select and project) using where clause, arithmetic & logical operations, aggregation.

UNIT-IV

SQL: Nested queries/ sub queries, implementation of different types of joins, Creating tables with relationship, implementation of key and integrity constraints, views, relational set operations, Transaction Control Language: commit, Rollback, Save point , DCL :Grant, Revoke

UNIT-V

PL/SQL: Introduction, Structure, Control Structures, Cursors, Procedure, Function.

Transaction processing Concepts: Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability.

Database management systems Text Books

- DatabaseManagementSystems,3rd Edition, Raghurama Krishnan, Johannes Gehrke, TMH
- DatabaseSystemConcepts,5th Edition, Silberschatz, Korth, TMH

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B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MINOR -2: DATA BASE MANAGEMENT SYSTEM (BBA Minor-2)

Time: 3 Hours Max.Marks: 60

PART-I

Answer any FIVE questions from the following. **5X4=20M**

1. Write about Database Applications.
2. Write about BCNF
3. Write about any 5 Basic SQL queries.
4. Write about DCL commands.
5. Write about Functions in PL/SQL.
6. Write about Data Independence.
7. Write a short note on Relational Algebra with examples.
8. Write about Entities and Attributes.

PART–II

Answer any **FIVE** of the following by selecting at least **TWO** from each Section **5X8=40M**

SECTION-A

9. Explain the characteristics of Database Systems.
10. Explain the concept of Keys in DBMS.
11. Explain ER Diagram.
12. Explain different types of joins.
13. Explain ACID properties.

SECTION-B

14. Explain various Data Models.
15. Explain 1NF, 2NF and 3NF with examples
16. Explain DDL operations with examples
17. Explain the concept of Views.
18. Explain about Serializability.

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B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)

MINOR -2: DATA BASE MANAGEMENT SYSTEM LAB (BBA Minor-2)

Practical | Credits:1 | 2 hrs/week

List of Experiments

SQL:

Cycle-I: Aim: Marketing company wishes to computerize their operations by using following tables.

Table Name: Client-Master

Description: Used to store client information

Column Name	Data Type	Size	Attribute
CLIENT_NO	Varchar2	6	Primary key
NAME	Varchar2	20	Not null
ADDRESS1	Varchar2	30	
ADDRESSS	Varchar2	30	
CITY	Varchar2	15	
PINCODE	Varchar2	8	
STATE	Varchar2	15	
BAL_DUE	Number	10,2	

Table Name: Product_Master
Description: Used to store product information

Column Name	Data Type	Size	Attribute
PRODUCT_NO	Varchar2	6	Primary key
DESCRIPTION	Varchar2	15	Not null
PROFIT_PERCENT	Number	4,2	Not null
UNIT_MEASUE	Varchar2	10	
QTY_ON_HAND	Number	8	
REORDER_LVL	Number	8	
SELL_PRICE	Number	8,2	Not null, cannot be 0
COST_PRICE	Number	8,2	Not null, cannot be 0

Table Name: Salesman_master
Description: Used to store salesman information working for the company.

Column Name	Data Type	Size	Attribute
SALESMAN_NO	Varchar2	6	Primary key
SALESMAN_NAME	Varchar2	20	Not null
ADDRESS1	Varchar2	30	
ADDRESS2	Varchar2	30	
CITY	Varchar2	20	
PINCODE	Number	8	
STATE	Vachar2	20	
SAL_AMT	Number	8,2	Not null, cannotbe0
TGT_TO_GET	Number	6,2	Not null, cannotbe0
YTD_SALES	Number	6,2	Not null
REMARKS	Varchar2	20	

Table Name: SALES- ORDER

Description: Used to store client's orders

Column Name	Data Type	Size	Attribute
ORDER_NO	Varchar2	6	Primary key
CLIENT_NO	Varchar2	6	Foreign Key
ORDER_DATE	Date		
DELY_ADDRESS	Varchar2	25	
SALESMAN_NO	Varchar2	6	Foreign Key
DELY_TYPE	Char	1	Delivery :part(p)/full(f)and default 'F'
BILL_YN	Char	1	
DELY_DATE	Date		Can't be less than order date
ORDER_STATUS	Varchar2	10	Values("In Process", "Fulfilled", "Back Order", "Cancelled.

Table Name: SALES_ORDER_DETAILS
Description: Used to store client's order with details of each product ordered.

Column Name	Data Type	Size	Attribute
ORDER_NO	Varchar2	6	Primary key references SALES_ORDER table
PRODUCT_NO	Varchar2	6	Foreign Key references SALES_ORDER_table
QTY_ORDERED	Number	8	
QTY_DISP	Number	8	
PRODUCT_RATE	Number	10,2	Foreign Key

Solve the following queries by using above tables.

1. Retrieve the list of names, city and the state of all the clients.
2. List all the clients who are located in 'Mumbai' or 'Bangalore'.
3. List the various products available from the product_ master table.
4. Find the names of salesman who have a salary equal toRs.3000.
5. List the names of all clients having 'a' as the second letter in their names.
6. ListallclientswhoseBaldueisgreaterthanvalue1000.
7. List the clients who stay in a city whose first letter is 'M'.
8. List all information from sales-order table for orders placed in the month of July.
9. List the products whose selling price is greater than 1000and less than or equal to3000.
10. Findtheproductswhosesellingpriceisgreaterthan1000andalsofindthe new selling price as original selling price 0.50.

Cycle-II Supplier

Aim: A manufacturing company deals with various parts and various suppliers supplytheseparts.Itconsistsofthreetablestorecorditsentireinformation.Those are as follows.

Supplier(Supplier_No,Sname,City,status)Part(Part_no,pname,color,weight,city, cost)

Shipment (supplier_No, Part_no, city) JX(project_no, project_name, city)

SPJX(Supplier_no, part_no, project_no,city)

1. Get supplier numbers and status for suppliers in Chennai with status>20.
2. Get project names for projects supplied by supplier 'S'.
3. Get colors of parts supplied by supplier S.
4. Get part numbers for parts supplied to any project in Mumbai.
5. Find the id's of suppliers who supply a red or pink parts.

Cycle–III Employee Database

Aim: An enterprise wishes to maintain a database to automate its operations. Enterprise divided into a c departments and each department consists of employees. The following two tables describes the auton schemas.

Emp(Empno, Ename, Job, Mgr, Hiredate, Sal, Comm, Deptno)

Dept(Deptno, Dname, Loc)

1. List the details of employees who have joined before the end of September '81.
2. List the name of the employee and designation of the employee, who does not report to anybody.
3. Listthename,salaryandPFamountofalltheemployees(PFiscalculatedas10%of salary)
4. List the names of employees who are more than 2yearsold in the organization.
5. Determine the number of employees, who are taking commission.
6. Updatetheemployeesalaryby20%, whos experience is greater than 12years.
7. Determine the department does not contain any employees.
8. Create a view, which contains employee name and their manager names working in sales department.
9. Determine the employees, whose total salary is like the minimum salary of any department.
10. List the department numbers and number of employees in each department.

PL/SQL PROGRAMS

1. Write a PL/SQL program to check the given string is palindrome or not.
2. The HRD manager has decide to raise the employee salaryby15% write a PL/SQL block to accept the employee number and update the salary of that employee. Display appropriate message based on the existe of the record in Emp table.
3. Write a PL/SQLprogramtodisplaytop10rowsin Emp table based on their job and salary.
4. Write a PL/SQL program toraisetheemployeesalaryby10%fordepartment number 30 people and also maintain the raised details in the raise table.
5. CreateaproceduretoupdatethesalariesofEmployeesby20%,for those who are not getting commission
6. Write a PL/SQL procedure to prepare an electricity bill by using following table. Table used: Elect

Name	Null?	Type
MNNO	NOTNULL	NUMBER(3)
CNAME		VARCHAR2(20)
CUR_READ		NUMBER(5)
PREV_READ		NUMBER(5)
NO_UNITS		NUMBER(5)
AMOUNT		NUMBER(8,2)
SER_TAX		NUMBER(8,2)
NET_AMT		NUMBER(9,2)

7. Create a trigger to avoid any transactions (insert,update,delete)on EMP table on Saturday & Sunday.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MINOR -3: PYTHON PROGRAMMING (BBA Minor-3)

Theory | Credits: 3 | 3 hrs/week

Unit-I

Getting Started with Python: Introduction to Python, Python Keywords , Identifiers , Variables , Comments, Data Types , Operators, Input and Output , Type Conversion , Debugging. Flow of Control, Selection, Indentation , Repetition , Break and Continue Statement , Nested Loops .

Strings-String Operations.

Unit-II

Functions: Functions, Built-in Functions, User Defined Functions, recursive functions, Scope of a Variable.

Python and OOP: Defining Classes, Defining and calling functions passing arguments, Inheritance, polymorphism, Modules – date time, math, Packages.

Exception Handling- Exception in python, Types of Exception, User-defined Exceptions.

Unit-III

List: Introduction to List, List Operations, Traversing a List, List Methods and Built-in Functions.

Tuples and Dictionaries, Introduction to Tuples, Tuple Operations, Tuple Methods and Built-in Functions. Introduction to Dictionaries, Dictionaries are Mutable, Dictionary Operations, Traversing a Dictionary, Dictionary Methods and Built-in functions.

Unit-IV

Introduction to NumPy, Array , NumPy Array , Indexing and Slicing , Operations on Arrays , Concatenating Arrays.

Data Handling using Pandas , Introduction to Python Libraries, Series, Data Frame, Importing and Exporting Data between CSV Files and Data Frames, Pandas Series Vs NumPy ndarray.

Unit-V

Plotting Data using Matplotlib: Introduction, Plotting using Matplotlib –Line chart, Bar chart, Histogram, Scatter Chart, Pie Chart.

GUI Programming and Database Connectivity Using Python. Graphical User Interfaces. Using the Tkinter Module, Creating Label, Text, Buttons, info Dialog Boxes, Radio button, Check button, Getting Input, Importing MySQL for Python , Connecting with a database, Forming a query in MySQL, Passing a query to MySQL.

References:

1. MarkLutz,LearningPython,5thEd.O"REILLY
2. Core Python Programming by Dr. R. Nageswara Rao
3. Problem Solving and Python Programming by E. Balaguru Swamy
4. Python programming: using problem solving approach by ReemaThareja.
5. Albert Lukaszewski, MySQL fo rPython, Packet Publishing

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MINOR -3: PYTHON PROGRAMMING (BBA Minor-3)

Time: 3 Hours | Max.Marks: 60

PART-I

Answer any FIVE questions from the following. **5X4=20M**

1. Write about Keywords in Python
2. Write about Packages.
3. Write a short note on Tuples in Python.
4. Write about Data Frame.
5. Write about Graphical User Interfaces.
6. Write about Type Conversion.
7. Explain User Defined Functions in Python with an example.
8. Write about Built-in Functions in Dictionary.

PART–II

Answer any **FIVE** of the following by selecting at least **TWO** from each Section **5X8=40M**

SECTION-A

9. Explain various Data Types in Python.
10. Explain the concept of Inheritance in Python.
11. Discuss various List Operations.
12. Explain Operations on Arrays.
13. Explain Tkinter Module.

SECTION-B

14. Explain various Operators in Python.
15. What is an Exception Handling? Explain Types of Exceptions.
16. Discuss various Dictionary Operations.
17. Explain various Python Libraries.
18. Explain how to create a label, text box and button with examples.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MINOR -3: PYTHON PROGRAMMING LAB(BBA Minor-3)

Practical | Credits:1 | 2 hrs/week

Lab Programs

1. Write a Program to check whether given number is Arm strong or not.
2. Write a Program to check whether given number is perfect or not.
3. Write a program to find factorial of given number using recursive function
4. Write a program to implement inheritance and polymorphism
5. Demonstrate a python code to print try, except and finally block statements
6. Write a program to demonstrate String handling functions
7. Write a program to input numbers from the user. Store these numbers in a tuple. Print the maximum and minimum number from this tuple.
8. Write aprogramtoenternamesofemployeesandtheirsalariesasinputandstorethemina dictionary
9. Write a program to implement statistical operations on arrays using num Py
10. Write a program to import and export CSV file to Data Frame.
11. Create the Data Frame Sales containing year wise sales and perform basic operation on it.
12. Visualize the plots using mat plotlib.
13. Create GUI interface with different types button and labels
14. Create GUI interface and connect with My SQL data base and perform CRUD(Create, Read, Update and Delete) operations.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MINOR -4: OPERATING SYSTEMS (BBA Minor-4)

Theory | Credits: 3 | 3 hrs/week

Course Objectives:

1. To know the basic Structure, Components and Organization of Operating System.
2. To learn the notation of a Process- a Program in Execution, Management, Scheduling and Classic Problems of Synchronization.
3. To gain knowledge in various Memory Management Techniques.
4. To understand Unix Operating System and Various File operations.

Course Outcomes:

The students will be able to:

1. Understand the main components and Structure of Operating System & their functions.
2. Analyze various ways of Process Management & CPU Scheduling Algorithms.
3. Evaluate various device and resources like Memory, Time and CPU Management techniques in distributed systems.
4. Apply different methods for Preventing Dead locks in a Computer System.
5. Create and build an Application/Service over the UNIX operating system.

Unit-I

Introduction: Definition of Operating System, Evolution of OS, Basic OS Functions, Computer System Architecture, Operating System Structure.

System Structures: Operating System Services, User Operating System Interface, System Calls, Types of System Calls, Over view of UNIX operating System, Basic Features of Unix Operating System.

Unit-II

Process Management: Process Concepts, Operation on Processes, Communication in Client-Server Systems.

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms,

Unit-III

Synchronization: Process Synchronization, Semaphores: Usage, Implementation, The Critical Section Problem.

Deadlocks: Introduction, Deadlock Characterization, Necessary and Sufficient conditions for Deadlock, Deadlock Handling Approaches: Deadlock prevention, Deadlock Avoidance and Deadlock detection and Recovery.

Unit-IV

Memory Management: Overview, Swapping, Contiguous Memory Allocation, Paging, Paging Examples, Segmentation, Page Replacement Algorithms, Memory management in UNIX.

Unit-V

Files and Directories in UNIX: Files, Directory Structure, File Operations, File System Implementation: File Allocation Methods.

TEXT BOOKS:

1. Operating System Concepts: Abraham Silberschatz, PeterB. Galvin, Greg Gagne,8th Edition, Wiley.
2. Unix and shell Programming by B.MHArwani, OXFORD University Press.

REFERENCE BOOKS:

1. Operating System Principles, Abraham Silberchatz, PeterB.Galvin,Greg Gagne8thEdition, Wiley Student Edition.
2. Principles of Operating Systems by Naresh Chauhan, OXFORD University Press.
3. Tanenbaum A S, Woodhull A S, Operating System Design and Implementation,3rd edition, PHI 2006.
4. Unix Shell Programming-Yashwant Kanetkar

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B.C.A II Year SEMESTER-IV
(w.e.f. 2023-24 Admitted Batch)

MINOR -4: OPERATING SYSTEMS (BBA Minor-4)

Time: 3 Hours | Max.Marks: 60

PART-I

Answer any FIVE questions from the following. **5X4=20M**

1. Multiprogramming.
2. Virtual machine.
3. Dispatch latency.
4. Critical region.
5. Compaction.
6. Basic Features of Unix Operating System.
7. Scheduling Criteria
8. Synchronization

PART–II

Answer any **FIVE** of the following by selecting at least **TWO** from each Section **5X8=40M**

SECTION-A

9. What is Operating system? Write types of Operating systems.
10. What is process control block. Explain
11. What is semaphore. Explain Critical section problem in detail.
12. What is swapping. Discuss
13. Illustrate file allocation methods.

SECTION-B

14. What is system program. Discuss types of system calls
15. Differentiate preemptive and non preemptive scheduling algorithm.
16. What is deadlock. Discuss Deadlock prevention.
17. Discuss demand paging and segmentation.
18. Explain about Directory Structure.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-IV

(w.e.f. 2023-24 Admitted Batch)

MINOR -4: OPERATING SYSTEMS LAB (BBA Minor-4)

Practical Credits:1 2 hrs/week

List of Experiments

1. Introducing the LINUX Nativeeditorvi: Working on basics of creating and editing a text file using standard commands of vi.
2. Introduction to UNIX Operating System, Compare with Windows OS. Writing and executing simple Hello World C Program in UNIX Environment.
3. Getting hands-on on basic UNIX Commands.
4. Writeaprogramusingthefollowingsystemcallsof UNIXOSfork,exec,getpid,exit,wait, close, open dir, read dir ?
5. Write a Simple shell script for basic arithmetic and logical calculations?
6. Write Shell script to check the given number is even or odd?
7. Write a shell script to swap the two integers?
8. Write Shell script to perform various operations on given strings.
9. Write Shell scripts to explores stem variables such as PATH ,HOME etc.
10. Write a shell script to display list of users currently logged in.
11. Write a shell script to delete all the temporary files.
12. Write a shell script to find the Factorial of a Number ?
13. Write C programs to implement the following Scheduling Algorithms:
    a) First Come First Serve.
    b) Shortest Job First.
    c) Round Robin.

Reference Text Books:

1. BrianW.KernighanandRobPike,"TheUNIXProgrammingEnvironment"Prentice HallIndia(EditionavailableinLPCandintheformofEBookonstudentresource)
2. YashwantKanetkar,"UNIXShellProgramming",BPBPublications(...)

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