

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 2025-26)



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.

APPROVED

Chalukya

B. Chalukya

K. Poosala

M. Kanishka



P. R. N. U. 24/10/2015
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DEPARTMENT OF COMPUTER SCIENCE

B.C.A I Year SEMESTER-I
 (w.e.f. 2025-26 Admitted Batch)

CURRICULAR FRAME WORK BCA HONOURS FROM THE A.Y.2025-26
 (Major + Minor with CSP&VI Semester Internship)

1st Year-Semester I

Sl. No	Category	Course No	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
			Theory	Practical		Theory	Practical	
1	Major 1- Computer Fundamentals and Office Automation	I	3	2	5	3	1	4
	Computer Fundamentals and Office Automation-Practical							
2	Major 2- Problem Solving Using C	II	3	2	5	3	1	4
	Problem Solving Using C-Practical							
3	AECC-English	I	4	0	4	3	0	3
4	AECC-MIL (Telugu/Hindi/Sanskrit)	I	4	0	4	3	0	3
5	Skill Enhancement Course (SEC) Intro' to Artificial Intelligence	I	4	2 (Practice)	6	4	0	4
End of Semester I of 1st Year		5	18	6	24	16	2	18

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*Y.C.N.
Chu
Saranya*

L. Poole

M. Kanishka



Dwifl J
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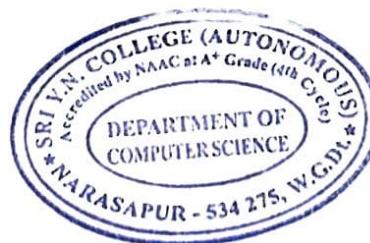
B.C.A I Year SEMESTER-II
 (w.e.f. 2025-26 Admitted Batch)

Sl. No	Category	Course No	No. of Hours		Total No. of Hours	No. of Credits		Total No.of Credits
			Theory	Practical		Theory	Practical	
1	Major 3- Data Structures using C	III	3	2	5	3	1	4
	Data Structures using C-Practical							
2	Major 4- Database Management System	IV	3	2	5	3	1	4
	Database Management System-Practical							
3	English	II	4	0	4	3	0	3
4	MIL (Telugu/Hindi/Sanskrit)	II	4	0	4	3	0	3
6	Multi disciplinary Course	I	2	0	2	2	0	2
6	Skill Enhancement Course (SEC) Application of Artificial Intelligence (Discipline Specific)	II	4	2 (Practice)	6	4	0	4
7	Indian Knowledge System	I	2	0	2	0	0	0
8	Community Service Project (minimum of 80 hours with 1 Credit)							1
End of Semester II of 1st Year		7	22	6	28	18	2	21

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*W.L. Chilu
B. Narayana.
L. Fadle*

H. Kanshi



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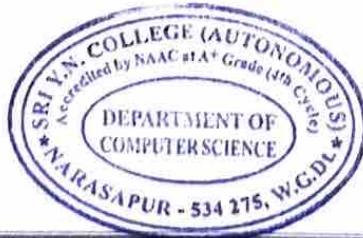
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**B.C.A II Year SEMESTER-III
(w.e.f. 2023-24 Admitted Batch)**

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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John
Alice
Sonya
L. Pacluk
McKenzie



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B.C.A II Year SEMESTER-IV

(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-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 DISCIPLINA RY COURSE	Introduction to Nanotechnology	50	-	50	2	2
Total			750	200	550	29	24

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*Y.N. Chell
Adikavi
Nannaya
L. Paleti
H. Kanishka*



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B.C.A III Year SEMESTER-V

(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-12	Major-12: Web Programming	100	40	60	3	3
		Web Programming Lab	50	-	50	2	1
2	Course -13	Major-13: Web Development PHP & MYSQL	100	40	60	3	3
		Development PHP & MYSQL Lab	50	-	50	2	1
3	Course -14	Major-14: Cloud Computing	100	40	60	3	3
		Cloud Computing Lab	50	-	50	2	1
4	Course-15	Major-15: Foundation of Data Science	100	40	60	3	3
		Foundation of Data Science Lab	50	-	50	2	1
4	Minor-5	Financial Management	100	40	60	5	4
5	Minor-6	Managerial Communication	100	40	60	5	4
6	Common value added course	Environmental Education	50	-	50	2	2
Total			850	240	610	32	26

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As per
Chair
Narsapur
K. Jagade

M. Kanishka




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B.C.A I Year SEMESTER-I
(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-1: COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION

Theory

Credits: 3

3 hrs/week

Course Objectives

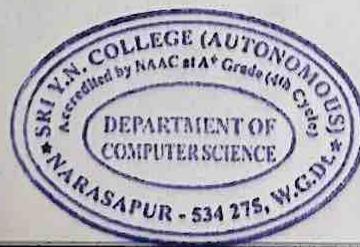
1. Understand foundational computing concepts, including number systems, the evolution of computers, block diagrams, and generational progress.
2. Develop knowledge of computer architecture, focusing on system organization and networking fundamentals.
3. Acquire practical skills in document creation, formatting, and digital presentations using word processing tools.
4. Gain proficiency in spreadsheet operations, such as data entry, formulas, functions, and charting techniques.
5. Introduce data visualization and basic modelling principles, fostering analytical thinking in structuring and interpreting data sets.

Course Outcomes

1. At the End of the Course, The Students will be able to explain different number systems, the historical evolution of computers, and identify key components in a block diagram.
2. Learners will demonstrate basic blocks of a computer and fundamental networking knowledge.
3. Learners will create professional-level documents and design visually appealing presentations using word processing software and presentation software.
4. Learners will manipulate data within spreadsheets, apply formulas, and generate accurate summaries and visualizations.
5. Learners will apply data modelling techniques to analyze, organize, and represent data effectively in various scenarios.

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*W.L
Chet
B. D. J. M. 9
E. Faheem
M. I.*



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Unit 1

Number Systems, Evolution, Block Diagram and Generations:

Number Systems: Binary, Decimal, Octal, Hexadecimal; conversions between number systems.

Evolution of Computers: History from early mechanical devices to modern-day systems.

Block Diagram of a Computer: Components like Input Unit, Output Unit, Memory, CPU (ALU+ CU).

Generations of Computers: First to Fifth Generation – technologies, characteristics, examples.

Unit 2

Basic organisation and N/W fundamentals:

Computer Organization: Functional components – Input/Output devices, Storage types, Memory hierarchy

Types of Computers: Micro, Mini, Mainframe, and Supercomputers.

Networking Fundamentals: Definition, need for networks, types (LAN, WAN, MAN), topology (Star, Ring, Bus).

Internet Basics: IP Address, Domain Name, Web Browser, Email, WWW.

Unit 3

Word Processing and presentations:

Word Processing Basics: Using MS Word/Google Docs – formatting, styles, tables, mail merge.

Presentation Tools: Using PowerPoint/Google Slides – slide design, animations, transitions.

Applications: Creating resumes, reports, brochures, and presentations.

Keyboard Shortcuts

Unit 4

Spreadsheet Basics:

Spreadsheet Concepts: Understanding rows, columns, cells in tools like MS Excel/Google Sheets.

Functions and Formulas: SUM, AVERAGE, IF, COUNT.

Charts and Graphs: Creating visual representations

Data Handling: Sorting, filtering, conditional formatting.

Text Functions: LEFT, RIGHT, MID, LEN, TRIM, CONCAT, TEXTJOIN

Advanced Functions: Logical: IF, AND, OR, IFERROR, Lookup: VLOOKUP, HLOOKUP, XLOOKUP, INDEX, MATCH

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L. P. Patel
H.D.



Patel
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Unit 5

Data Modelling:

Conditional Formatting: Custom rules, Color scales, Icon sets, Data bars

Data Analysis Tools: Pivot Tables and Pivot Charts, Data Validation (Drop-downs, Input Messages, Error Alerts), What-If Analysis: Goal Seek, Scenario Manager, Data Tables.

Textbooks:

1. **Fundamentals of Computers**, Reema Thareja, Oxford University Press, Second Edition
2. **Fundamentals of Computers**, V. Rajaraman – PHI Learning
3. **Introduction to Computers** by Peter Norton – McGraw Hill
4. **Microsoft Office 365 In Practice** by Randy Nordell – McGraw Hill Education

References:

1. **Excel 2021 Bible** by Michael Alexander, Richard Kusleika – Wiley
2. **Networking All-in-One For Dummies** by Doug Lowe – Wiley
3. **Microsoft Official Docs and Training**: <https://learn.microsoft.com>
4. **Google Workspace Learning Center**: <https://support.google.com/a/users/>

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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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*K.S. Anil
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B. Baruwa
L. Patel
M. R.*



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DEPARTMENT OF COMPUTER SCIENCE

B.C.A I Year SEMESTER-I

(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-1: COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION

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 different number systems with examples and conversions.
2. Draw and explain the block diagram of a computer in detail.
3. Explain the functional components of a computer with a neat diagram.
4. Discuss different types of computers with examples.
5. Describe different network topologies with diagrams.

Section-II

6. Write steps to insert tables and apply styles in MS Word.
7. Explain how to add animations and transitions in PowerPoint.
8. Write a note on conditional formatting in spreadsheets.
9. Describe steps to sort and filter data in MS Excel.
10. Discuss the process of data validation and its types.

Section-III

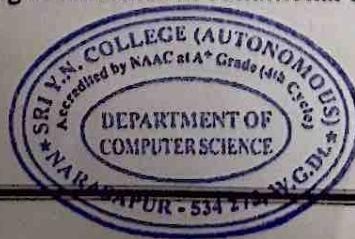
Answer any five questions from the following.

(5X4=20M)

11. List any four characteristics of First Generation Computers.
12. Write two differences between input and output units.
13. What is the role of a web browser?
14. Define Mail Merge in Ms Word.
15. Write any four keyboard shortcuts used in MS Word.
16. Write syntax of SUM and AVERAGE functions with examples.
17. What is the purpose of Goal Seek in Excel?
18. Write two examples of using color scales in conditional formatting.

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M. Narayana
L. Patel*



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DEPARTMENT OF COMPUTER SCIENCE

B.C.A I Year SEMESTER-I
(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-1: COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION LAB

Practical

Credits:1

2 hrs/week

List of Experiments:

1. Demonstration of Assembling and Desembling of Computer Systems.
2. Identify and prepare notes on the type of Network topology of your institution.
3. Prepare your resume in Word.
4. Using Word, write a letter to your higher official seeking 10-days leave.
5. Prepare a presentation that contains text, audio and video.
6. Using a spreadsheet, prepare your class Time Table.
7. Using a Spreadsheet, calculate the Gross and Net salary of employees(Min 5) considering all the allowances.
8. Generate the class-wise and subject-wise results for a class of 20 students. Also generate the highest and lowest marks in each subject.
9. Using IF, AND, OR, and IFERROR to Automate Grade Evaluation.
 - a. Create a table of student scores in different subjects.
 - b. Use IF to assign grades (A/B/C/Fail).
 - c. Use IFERROR to handle missing scores or invalid data.
10. Employee Database Search Using VLOOKUP, HLOOKUP, XLOOKUP, INDEX, and MATCH
 - a. Create a database of employees (Name, ID, Department, Salary).
 - b. Implement VLOOKUP to search by employee ID.
 - c. Use HLOOKUP to extract department heads by role.
 - d. Apply XLOOKUP for more flexible searches.
 - e. Use INDEX + MATCH as an alternative to VLOOKUP.
11. Sales Report Analysis Using Pivot Tables and Charts
 - a. Use a dataset of product sales (Product, Region, Date, Quantity, Revenue).
 - b. Create Pivot Tables to summarize data by region/product.
 - c. Insert Pivot Charts for visual analysis (e.g., bar, line).
 - d. Add slicers to make the dashboard interactive.

12. Designing a Data Entry Form with Drop-downs and Input Rules

- a. Create a student registration form.
- b. Add drop-down lists for course selection using Data Validation.
- c. Add input messages to guide users.
- d. Add error alerts for wrong entries.

13. Monthly Budget Planning using Goal Seek and Scenario Manager

- a. Create a simple personal budget (income, expenses, savings).
- b. Use Goal Seek to determine income needed to save a desired amount.
- c. Use Scenario Manager to compare different budgeting scenarios (best/ worst/ realistic case).

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10/01/2016
K. Paresh
B. Manjula





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B.C.A I Year SEMESTER-I
(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-2: PROBLEM SOLVING USING C

Theory

Credits: 3

3 hrs/week

Course Objectives:

1. Understand the fundamentals of computer programming. Apply structured problem-solving approaches using algorithms, flowcharts, and C programming constructs.
2. Develop efficient logic using decision-making, loop, and jump control statements.
3. Utilize derived data types like arrays and strings for modular program design.
4. Design and implement modular solutions using functions, recursive logic, pointer operations, and dynamic memory management.
5. Handle complex data structures including structures, unions, and text file operations.

Course Outcomes:

At the End of the Course, The Students will be able to:

1. Understand basic computing concepts, programming paradigms and write structured C programs.
2. Apply control flow statements to solve logical and repetitive tasks in C.
3. Implement arrays and string operations to manage and manipulate data efficiently.
4. Design modular code using functions, recursion, and appropriate parameter passing.
5. Utilize pointers and memory operations for effective data handling. Demonstrate competence in dynamic memory allocation and text file processing.

Unit 1

Introduction to computer programming:

Introduction, Types of software, Compiler and interpreter, Concepts of Machine level, Assembly level and high-level programming, Flowcharts and Algorithms, Fundamentals of C: History of C, Features of C, C Tokens-variables and keywords and identifiers, constants and Data types, Rules for constructing variable names, Operators, Structure of C program, Input /output statements in C- Formatted and Unformatted I/O.

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Unit 2

Control statements:

Decision making statements: if, if else, else if ladder, switch statements. Loop control statements: while loop, for loop and do-while loop. Jump Control statements: break, continue and goto.

Unit 3

Derived data types in C:

Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation. Strings: Declaring & Initializing string variables; String handling functions, Character handling functions

Unit 4

Functions:

Pointers: Pointer data type, Pointer declaration, initialization, accessing values using pointers. Pointer arithmetic, Pointers and arrays.

Function Prototype, definition and calling. Return statement. Nesting of functions. Categories of functions. Recursion (Basic Concept only). Parameter Passing by address & by value. Local and Global variables. Storage classes: automatic, external, static and register.

Unit 5

Dynamic Memory Management:

Introduction, Functions-malloc, calloc, realloc, free Structures: Basics of structure, structure members, accessing structure members, nested structures, array of structures, structure and functions, structures and pointers. Unions - Union definition; difference between Structures and Unions.

Working with text files - modes: opening, reading, writing and closing text files.

Text Books:

1. Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill, 6 th Edn,
2. Computer fundamentals and programming in C, Reema Theraja, Oxford University Press

Reference Books:

1. Let us C, Y Kanetkar, BPB publications
2. Head First C: A Brain-Friendly Guide, David Griffiths, Dawn Griffiths

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M. Kanest



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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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Chile
K. Gade
B. S. D. M.

M. Kanishka



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DEPARTMENT OF COMPUTER SCIENCE

B.C.A I Year SEMESTER-I
(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-2: PROBLEM SOLVING USING C

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 Operators in C.
2. Discuss the structure of a C program in detail.
3. Write about different decision making statements in C with suitable examples.
4. Explain the Switch-Case statement in C with an example.
5. Explain the Loop control statements in C with examples.

Section – II

6. Define an Array. Explain about declaration and accessing elements of an array with an example.
7. Explain about different String handling functions in C.
8. Explain the concept of Pointers in C.
9. Define Function. Write about Call by value and Call by reference in detail with an example.
10. Explain about Structures in C with an example.

Section – III

(5X4=20M)

Answer any five questions from the following.

11. Building blocks of a Flow Chart.
12. Write about Basic Data types.
13. Break and Continue.
14. Operations on Arrays.
15. String Functions.
16. Dynamic Memory Allocation.
17. Write notes on Unions.
18. Modes of a File.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A I Year SEMESTER-I
(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-2: PROBLEM SOLVING USING C LAB

Practical

Credits: 1

2 hrs/week

List of Experiments:

1. Write a program to check whether the given number is Armstrong or not.
2. Write a program to find the sum of individual digits of a positive integer.
3. Write a program to generate the first n terms of the Fibonacci sequence.
4. Write a program to find both the largest and smallest number in a list of integer values
5. Write a program to demonstrate change in parameter values while swapping two integer variables using Call by Value & Call by Address
6. Write a program to perform various string operations.
7. Write a program to search an element in a given list of values.
8. Write a program that uses functions to add two matrices.
9. Write a program to calculate factorial of given integer value using recursive functions
10. Write a program for multiplication of two N X N matrices.
11. Write a program to sort a given list of integers in ascending order.
12. Write a program to calculate the salaries of all employees using Employee (ID, Name, Designation, Basic Pay, DA, HRA, Gross Salary, Deduction, Net Salary) structure.
 - a. DA is 30 % of Basic Pay
 - b. HRA is 15% of Basic Pay
 - c. Deduction is 10% of (Basic Pay + DA)
 - d. Gross Salary = Basic Pay + DA+ HRA
 - e. Net Salary = Gross Salary - Deduction
13. Write a program to read / write the data from / to a file.
14. Write a program to reverse the contents of a file and store in another file.
15. Write a program to create Book (ISBN,Title, Author, Price, Pages, Publisher)structure and store book details in a file and perform the following operations
 - a. Add book details
 - b. Search a book details for a given ISBN and display book details, if available
 - c. Update a book details using ISBN
 - d. Delete book details for a given ISBN and display list of remaining Books

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Accredited by NAAC with A⁺ Grade (4th Cycle)

Skill Enhancement Course, Semester-I (NEP: UGC-CCFUGP) (w.e.f. 2025-26)

SEC-1EIS: AI FUNDAMENTALS

(Common for All UG Programmes)

Credits: 04 (Theory-04, Practice-00)

(Theory: 60 Hours, Practice: 30 Hours)

Course Learning Objectives:

The Learning Objectives of this course are as follows:

- Understand the history and evolution of Artificial Intelligence and Identify major subfields of AI.
- Investigate the role of AI in various industries like healthcare, agriculture, and education.
- Examine concepts like bias, fairness, transparency, and accountability in AI systems.
- Explore the integration of AI in scientific research and discuss future directions and evolving trends in AI.
- Learn how prompt engineering is used in various sectors like education and content creation.

Course Learning Outcomes:

On successful completion of the course, students will be able to:

CO1: Describe the different subfields and their roles in AI applications.

CO2: Analyze the benefits and limitations of AI in diverse domains.

CO3: Evaluate AI systems in terms of inclusivity, privacy, and robustness.

CO4: Describe Generative AI and emerging technologies like ChatGPT.

CO5: Apply prompt engineering concepts to various real-world use cases.

Syllabus Contents:

Unit-I

(11 Lectures)

Basics of AI: Introduction to Artificial Intelligence, History, Definition, Artificial General Intelligence, Challenges in AI.

Major Subfields of AI: Knowledge Engineering, Machine Learning, Computer Vision, Natural Language Processing, Robotics.

Unit-II:

(10 Lectures)

Applications of AI:

Part-1: Healthcare, Finance, Retail, Agriculture,

Part-2: Education, Transportation, Smart Cities and Industry 4.0;

Unit-III:

(9 Lectures)

Ethics and Responsible AI :

Part-1: Ethics in AI, Bias and Fairness in AI Systems, Transparency in AI Systems

Part-2: Accountability, Security, Privacy, Inclusivity, Sustainability, Robustness, and, Reliability in AI Systems

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Unit-IV:**(16 Lectures)**

AI in Research and Generative AI: AI in Experimentation and Multi-disciplinary research, Generative AI introduction, ChatGPT, Hugging Face, Gemini and other tools basics, Perplexity, **Fundamentals of Prompt Engineering:** Prompt Engineering Definition and its importance, Role of Prompt Engineering in AI/ML Interaction, Emerging trends and Future Directions in AI.

Unit-V:**(14 Lectures)****Applications of Prompt Engineering:**

Part-1: Education, Business & Commerce, Content Creation: AI for Creative Writing, AI for creative design

Part-2: Writing AI scripts for video, generating slides and slidesGPT usage, Designing thumbnails and channel branding with AI

Essential Readings:

1. AI for Everyone: A Beginner's Handbook for Artificial Intelligence (AI) by Saptarsi Goswami, Amit Kumar Das , Amlan Chakrabarti
2. Prompt Engineering for Beginners: by Kapila Arora, Geetu Garg, Gaurav Arora.

Suggestive Readings:

1. Let's Learn Artificial Intelligence: Base Module, Niti Ayog, Atal Innovation Mission.
2. Prompt Engineering for Generative AI: Future-proof inputs for Reliable AI-outputs by James Phoenix & Mike Taylor.
3. Generative AI Tutorial: https://www.w3schools.com/gen_ai/
4. Generative AI 360°: Practical Guide to ChatGPT, Midjourney & AI Tools to Boost Productivity & Creativity , For Professionals, Marketers & Entrepreneurs by Hitesh Motwani , ZebraLearn, 2025.
5. Generative AI: Prompt Engineering Basics:
6. Learn Generative AI Prompt Engineering for everyone.
<https://www.coursera.org/learn/generative-ai-prompt-engineering-for-everyone?action=enroll>
7. Free Artificial Intelligence (AI) Tutorial - Hands-On Prompt Engineering for AI Beginners & Business User | Udemy,
<https://www.udemy.com/course/prompt-engineering-for-ai-beginners-business-users>

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Skill Enhancement Course, Semester-I (NEP: UGC-CCFUGP) (w.e. f. 2025-26)

SEC-1EIS: AI FUNDAMENTALS

(Common for All UG Programmes)

MODEL QUESTION PAPER

Time: 3Hrs

Max. Marks: 60

PART-I

PART-I
Answer any **FIVE** questions, choosing at least **TWO** from Sections A & B.
Each question carries **8** marks.

(5 × 8= 40 Marks)

SECTION-A

1. Define Artificial Intelligence and explain Artificial General Intelligence.
2. Discuss Computer Vision and Natural Language Processing.
3. Explain the applications of AI in the Healthcare sector with suitable examples.
4. Discuss the applications of AI in Transportation sector with suitable examples.
5. Discuss bias and fairness in AI systems with suitable examples.

SECTION-B

6. Describe security and privacy in AI systems.
7. Discuss the concept of Generative AI and its significance in modern AI applications.
8. Define Prompt Engineering and its role in AI/ML interaction.
9. Explain the applications of Prompt Engineering in the Education sector with suitable examples.
10. Explain how Prompt Engineering is used to write AI scripts for videos.

PART-II

SECTION-C

Answer any FIVE questions. Each question carries 4 marks.

(5 × 4= 20 Marks)

11. Mention four major challenges in Artificial Intelligence
12. Explain Machine Learning briefly.
13. List Four applications of AI in Education.
14. Explain ethics in AI.
15. Explain Transparency in AI Systems
16. Write a short note on Perplexity
17. List two applications of Prompt Engineering in Business
18. Explain the role of AI in creative writing.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A I Year SEMESTER-II

(w.e.f. 2025-26 Admitted Batch)

Sl. No	Category	Course No	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
			Theory	Practical		Theory	Practical	
1	Major 3- Data Structures using C	III	3	2	5	3	1	4
	Data Structures using C- Practical							
2	Major 4- Database Management System	IV	3	2	5	3	1	4
	Database Management System-Practical							
3	English	II	4	0	4	3	0	3
4	MIL (Telugu/Hindi/Sanskrit)	II	4	0	4	3	0	3
6	Multi disciplinary Course	I	2	0	2	2	0	2
6	Skill Enhancement Course (SEC) Application of Artificial Intelligence (Discipline Specific)	II	4	2 (Practice)	6	4	0	4
7	Indian Knowledge System	I	2	0	2	0	0	0
8	Community Service Project (minimum of 80 hours with 1 Credit)							1
End of Semester II of 1st Year		7	22	6	28	18	3	21

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A I Year SEMESTER-II
(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-3: DATA STRUCTURES USING C

Theory

Credits: 3

3 hrs/week

Course Objectives:

1. Understand the fundamentals of computer programming, Apply structured problem-solving approaches using algorithms, flowcharts, and C programming constructs.
2. Develop efficient logic using decision-making, loop, and jump control statements.
3. Utilize derived data types like arrays and strings for modular program design.
4. Design and implement modular solutions using functions, recursive logic, pointer operations, and dynamic memory management.
5. Handle complex data structures including structures, unions, and text file operations.

Course Outcomes:

At the End of the Course, The Students will be able to:

1. Understand basic computing concepts, programming paradigms and write structured C programs.
2. Apply control flow statements to solve logical and repetitive tasks in C.
3. Implement arrays and string operations to manage and manipulate data efficiently.
4. Design modular code using functions, recursion, and appropriate parameter passing.
5. Utilize pointers and memory operations for effective data handling.

Demonstrate competence in dynamic memory allocation and text file processing.

Unit 1. Basic Concepts:

Algorithm: Definition and characteristics, Complexity analysis: Space Complexity, Time Complexity, Asymptotic Notations.

Introduction to Data structures: Definition, Types of Data structures, Abstract Data Types (ADT), Introduction to Linked Lists, Representation of linked lists in Memory, Comparison between Linked List and Array.

Unit 2. Linked Lists:

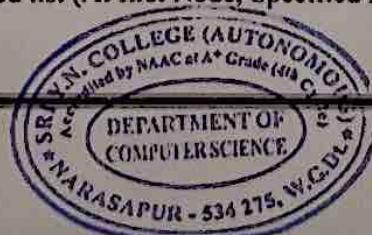
Types of Linked Lists - Singly Linked list, Doubly Linked list, Circularly Singly Linked list, Circularly Doubly Linked list; Implementation of Single Linked List

ADT: Creating a List, Traversing a linked list, Searching in linked list, Insertion and deletion into linked list (At first Node, Specified Position, Last node).

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Unit 3. Stacks and Queues:

Introduction to stack ADT, Implementation of stacks using array and Linked List, Application of stacks - Polish Notations - Converting Infix to Post Fix Notation - Evaluation of Post Fix Notation.

Queues: Introduction to Queue ADT, Implementation of Queues using array and Linked List, Application of Queues Types of Queues- Circular Queues, De-queues, Priority Queue, Heaps.

Unit 4. Searching and Sorting:

Linear or Sequential Search, Binary Search, Hashing and collision resolution.

Sorting: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort and Merge Sort

Unit 5. Trees and Graphs:

Tree Terminology, Binary Tree Representation, Traversal techniques, Expression Tree, Binary Search Tree- Definition, Operations on a Binary Search Tree: Creation, Search, Insertion & deletion.

Graphs: Introduction to Graphs, Terminology, Representation (Adjacency Matrix, Adjacency List), Traversal of Graphs (DFS, BFS), Applications of Graphs, Concept of Shortest Path Problems, Concept of Minimum Cost Spanning Tree.

Textbooks:

1. Data Structures Using C, Balagurusamy E. Tata McGraw Hill
2. Data Structures using C, Reema Thareja, Third Edition, Oxford University Press

Reference Books:

1. Data Structures, Lipschutz, Schaum's Outline Series, Tata McGraw-hill
2. Data Structures Using C, Ch. Vijay Kumar, Pen Press International

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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 I Year SEMESTER-II
(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-3: DATA STRUCTURES USING C

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 Linked List. Explain types of Linked Lists.
4. Explain the implementation of Single Linked List in detail.
5. Write notes on operations performed on Linked List.

Section – II

6. Discuss the implementation of Stack using Arrays.
7. Explain the Queue Data Structure in detail.
8. Explain Binary Search mechanism with an example.
9. Explain Bubble Sort Technique with an Example.
9. Explain tree traversing techniques in detail.

Section – III

Answer any five questions from the following.

(5X4=20M)

11. Describe Asymptotic Notations.
12. Describe ADT(Abstract Data Type).
13. Explain Double Linked List.
14. Explain Circular Queue.
15. PUSH & POP operations.
16. Explain Selection sort.
17. Binary Search Tree (BST).
18. Operations on Graphs

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A I Year SEMESTER-II

(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-3: DATA STRUCTURES USING C LAB

Practical

Credits:1

2 hrs/week

List of Experiments

1. Write a program to read 'N' numbers of elements into an array and also perform the following operation on an array
 - a. Add an element at the beginning of an array
 - b. Insert an element at given index of array
 - c. Update an element using a values and index
 - d. Delete an existing element
2. Write a program to implement Single Linked List with insertion, deletion and traversal operations
3. Write a program to implement Doubly Linked List with insertion, deletion and traversal operations
4. Write a program to implement the Stack operations using Arrays and Linked Lists.
5. Write a program to convert a given infix expression to a postfix expression using stacks.
6. Write a program to implement the Queue operations using Arrays and Linked Lists.
7. Write a program to implement the Circular Queue operations using Arrays.
8. Write a program for Binary Search Tree Traversals
9. Write a program to search an item in a given list using the following Searching Algorithms
 - a. Linear Search
 - b. Binary Search.
10. Write a program for implementation of the following Sorting Algorithms
 - a. Bubble Sort
 - b. Insertion Sort
 - c. Quick Sort
 - d. Merge Sort

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DEPARTMENT OF COMPUTER SCIENCE

R.C.A.I Year SEMESTER-II

(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-4: DATA BASE MANAGEMENT SYSTEMS

Theory

Credits: 3

3 hrs/week

Course Objectives:

1. To understand the fundamentals of data, information, and the evolution from file-based systems to modern database management systems.
2. To develop the ability to design conceptual data models using Entity-Relationship (ER) and Enhanced ER diagrams.
3. To explore relational model principles, such as keys, integrity constraints, relational algebra and calculus, and normalization.
4. To perform data definition and manipulation using SQL commands including queries, joins, subqueries, views, and set operations.
5. To apply procedural logic using PL/SQL, incorporating control structures, functions, procedures, and database triggers.

Course Outcomes:

At the End of the Course, The Students will be able to:

1. **Describe** the fundamentals of data, database systems, and the differences between file-based and database approaches. **Compare and classify** various DBMS architectures, data models, and their components, including the three-schema architecture.
2. **Design** conceptual data models using Entity-Relationship and Enhanced ER diagrams, applying generalization, specialization, and constraints.
3. **Apply** relational model concepts, including CODD rules, relational algebra, relational calculus, and normalization techniques.
4. **Construct and execute** SQL queries for data definition, manipulation, aggregation, joining, and subqueries, including views and set operations.
5. **Develop** PL/SQL programs incorporating control structures, procedures, functions, and triggers to manage database behavior effectively.

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Unit 1. Overview of Database Management System:

Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, database approach, Classification of Database Management Systems, advantages of database approach, Various Data Models, Components of Database Management System, three schema architecture of data base, costs and risks of database approach.

Unit 2. Entity-Relationship Model:

Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, IS A relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, advantages of ER modeling.

Unit 3. Relational Model:

Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra, Functional dependencies and normal forms.

Unit 4. Structured Query Language:

Introduction, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, Data Manipulation Language, Table Modification Commands, Join Operation, Set Operations, View, Sub Query.

Unit 5. PL/SQL:

Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structures, Steps to Create a PL/SQL, Program, Iterative Control, Procedures, Functions.

Textbooks:

1. Database System Concepts, Avi Silberschatz, Henry F. Korth, S. Sudarshan, Seventh Edition, McGraw-Hill

2. Database Management Systems by Raghu Ramakrishnan, McGrawhill

Reference Books:

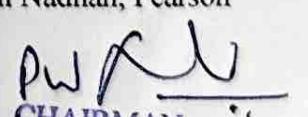
1. Fundamentals of Database Systems, Elmasri Navathe Pearson Education

2. An Introduction to Database systems, C.J. Date, A.Kannan, S.Swami Nadhan, Pearson

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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 I Year SEMESTER-II

(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-4: 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 I Year SEMESTER-II

(w.e.f. 2025-26 Admitted Batch)

MAJOR COURSE-4: DATABASE MANAGEMENT SYSTEMS LAB

Practical

Credits:1

2 hrs/week

Experiment 1 : Database: Inventory

Management Table 1: Products

Structure:

Column Name	Data Type	Constraints
product_id	INT	PRIMARY KEY
product_name	VARCHAR(50)	NOT NULL
price	DECIMAL(10,2)	CHECK(price > 0)
stock_qty	INT	CHECK(stock_qty >= 0)

Sample Data:

Product id	Product name	price	stockqty
1	Pen	10.00	100
2	Notebook	50.00	200
3	Stapler	120.00	50
4	Marker	25.00	80
5	File Folder	60.00	150

Table 2: Suppliers Structure:

Column Name	Data Type	Constraints
supplier_id	INT	PRIMARY KEY
supplier_name	VARCHAR(50)	NOT NULL
contact_no	VARCHAR(20)	UNIQUE
product_id	INT	FOREIGN KEY REFERENCES Products(product_id)

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Sample Data:

supplier_id	supplier_name	contact_no	product_id
101	StationeryMart	9876543210	1
102	PaperWorld	9876500000	2
103	OfficeSupplies	9876512345	3
104	MarkerHub	9876522222	4
105	FileDepot	9876533333	5

Section A: DDL (Data Definition Language)

1. Create a database called InventoryDB.
2. Create a table Products and table Suppliers with the specified columns and constraints.

Section B: DML (Data Manipulation Language)

4. Insert at least 5 rows into the Products table.
5. Insert at least 5 rows into the Suppliers table.
6. Update the stock quantity of product 'Pen' to 120.
7. Delete a supplier with a specific supplier_id.
8. Write a query to rename 'Notebook' to 'NoteBook A4'

Section C: DQL (SELECT Queries)

4. Display all records from the Products table.
5. Display only product_name and price of all products.
6. List all products that have a stock quantity less than 100.
7. Show all products between 20 and 100 price range.
8. Find all suppliers whose contact number starts with '98765'.
9. Find the average price of products.
10. Display the total number of products in the inventory.
11. Show the maximum and minimum stock quantities.
12. Count how many suppliers supply each product.
13. Show all products where price > 50 AND stock_qty > 100.
14. Show all products where price < 20 OR stock_qty < 80.
15. Display suppliers whose supplier_name contains the word 'Mart'
16. List all suppliers along with the product they supply (use INNER JOIN).
17. Display suppliers whose name starts with 'S'.
18. Find products whose name has exactly 5 characters
19. Find suppliers who supply products costing more than 100.

Experiment 2 : ONLINE BOOKSTORE DB

An online book store wants to implement a BOOKSTORE DB for managing their online transactions by using the following tables.

Authors Table

Column Name	Data Type	Constraints
author_id	INTEGER	PRIMARY KEY
first_name	VARCHAR	NOT NULL
last_name	VARCHAR	NOT NULL
nationality	VARCHAR	NULL allowed

Books Table

Column Name	Data Type	Constraints
book_id	INTEGER	PRIMARY KEY
Title	VARCHAR	NOT NULL
author_id	INTEGER	FOREIGN KEY REFERENCES Authors
publication_year	INTEGER	
Price	DECIMAL	

Customers Table

Column Name	Data Type	Constraints
customer_id	INTEGER	PRIMARY KEY
first_name	VARCHAR	NOT NULL
last_name	VARCHAR	NOT NULL
Email	VARCHAR	UNIQUE, NOT NULL
Address	VARCHAR	NOT NULL

Orders Table

Column Name	Data Type	Constraints
order_id	INTEGER	PRIMARY KEY
customer_id	INTEGER	FOREIGN KEY REFERENCES Customers
book_id	INTEGER	FOREIGN KEY REFERENCES Books
order_date	DATE	NOT NULL
quantity	INTEGER	NOT NULL

SAMPLE DATA SET for BOOKSTORE DB

Authors Table

author_id	first_name	last_name	nationality
1	Jane	Austen	British
2	George	Orwell	British
3	Gabriel	Garcia Marquez	Colombian
4	Toni	Morrison	American
5	Mark	Twain	American
6	Harper	Lee	American
7	Fyodor	Dostoevsky	Russian

Books Table

book_id	Title	author_id	publication_year	price
101	Pride and Prejudice	1	1813	12.99
102	1984	2	1949	9.50
103	One Hundred Years of Solitude	3	1967	15.00
104	Beloved	4	1987	11.25
105	Animal Farm	2	1945	8.75
106	Adventures of Huckleberry Finn	5	1884	10.50
107	To Kill a Mockingbird	6	1960	14.00

Customers Table

customer_id	first_name	last_name	Email	address
201	Alice	Smith	alice.s@example.com	12 Oak St, London
202	Bob	Johnson	bob.j@example.com	45 Pine Ave, Oxford
203	Charlie	Brown	charlie.b@example.com	78 Maple Rd, Bristol
204	Diana	Prince	diana.p@example.com	34 Queen St, York
205	Edward	Norton	edward.n@example.com	22 River Ln, Leeds
206	Fiona	Hall	fiona.h@example.com	56 Lake Dr, Bath
207	Greg	Miller	greg.m@example.com	89 Park Ave, Glasgow

Orders Table

order_id	customer_id	book_id	order_date	Quantity
301	201	101	2025-07-20	1
302	202	102	2025-07-21	2
303	201	105	2025-07-22	1
304	203	103	2025-07-23	1
305	204	106	2025-07-24	1
306	205	107	2025-07-25	3
307	206	104	2025-07-26	2

Section A: DDL (Schema Design & Constraints)

1. Write SQL statements to create all 4 tables (Authors, Books, Customers, Orders)

with:

- o Primary Keys
- o Foreign Keys
- o Appropriate data types
- o NOT NULL constraints where necessary.

2. Alter the Books table to add a constraint that price must be greater than 0.
3. Add a new column phone_number to the Customers table
(VARCHAR(15)) and ensure it is unique.
4. Drop the phone_number column from the Customers table.

Section B: DML (Data Manipulation)

5. Insert at least 7 records for each table (use sample dataset above).
6. Update the price of the book titled *Animal Farm* by increasing it by 10%.
7. Delete all orders made before 2025-07-21.
8. Change the nationality of Gabriel Garcia Marquez to "Latino-American".

Section C: SELECT Queries (Data Querying)

9. List all books published between 1900 and 2000.
10. Find all customers whose email contains "example.com".
11. Retrieve books whose price is between 10 and 15 and published before 1950.
12. Show authors who are either 'British' or 'American'.
13. Find books that have a price less than 10 or are published after 1980.

14. Display all orders placed after 2025-07-22.
15. List all books written by author with author_id = 2.
16. Find customers whose last name starts with B.
17. Show all books with a price NOT between 9 and 13.
18. Display books whose publication_year is in (1813, 1945, 1987).
19. Find authors whose nationality is NOT 'British'.
20. List customers whose address contains the word Park.
21. Show all books sorted by price in descending order.
22. List authors in alphabetical order by last_name.
23. Display orders sorted by
order_date (latest first). Use of Date
Functions
24. Show all orders placed in July 2025.
25. Show all orders with an estimated delivery date (5 days after order date).
26. Show customers who placed an order on a weekend.
27. Calculate how many days have passed since the last order was placed.

Aggregate Functions (COUNT, SUM, AVG, MIN, MAX)

28. Count the total number of books in the database.
29. Find the average price of all books.
30. Show the highest-priced book.
31. Count how many orders each customer has placed.
32. Calculate the total sales (price \times quantity) for each customer.

GROUP BY and HAVING

33. Count how many books are written by each author.
34. Group orders by customer_id and display total quantity ordered.
35. Show customers who have ordered more than 2 books in total (use HAVING).
36. Find the total number of books sold per author (GROUP BY author).

Experiment 3: EMPLOYEE DB

An enterprise wants to automate its employee management process by implementing an Employee Database. The goal is to replace manual record-keeping with a centralized system that stores employee, department, and project details. Use the following table structures and data set to implement Employee DB.

Employee DB – Table Structures

1. Departments Table

Column	Type	Constraints
dept_id	INT	PRIMARY KEY
dept_name	VARCHAR	UNIQUE, NOT NULL
location	VARCHAR	NOT NULL

2. Employees Table

Column	Type	Constraints
emp_id	INT	PRIMARY KEY
first_name	VARCHAR	NOT NULL
last_name	VARCHAR	NOT NULL
email	VARCHAR	UNIQUE, NOT NULL
phone	VARCHAR	CHECK (phone LIKE '--____')
hire_date	DATE	NOT NULL
job_title	VARCHAR	NOT NULL
salary	DECIMAL	CHECK (salary > 0)
dept_id	INT	FOREIGN KEY REFERENCES Departments(dept_id)
manager_id	INT	FOREIGN KEY REFERENCES Employees(emp_id) (self-referential)

1. Projects Table

Column	Type	Constraints
project_id	INT	PRIMARY KEY
project_name	VARCHAR	NOT NULL
start_date	DATE	NOT NULL
end_date	DATE	NULL
dept_id	INT	FOREIGN KEY REFERENCES Departments(dept_id)

2. Employee_Project Table (Many-to-Many)

Column	Type	Constraints
emp_id	INT	FOREIGN KEY REFERENCES Employees(emp_id), PRIMARY KEY(emp_id, project_id)
project_id	INT	FOREIGN KEY REFERENCES Projects(project_id)
hours_allocated	INT	CHECK (hours_allocated > 0)

Sample Data Set Departments Table

dept_id	dept_name	Location
1	HR	New York
2	IT	San Francisco
3	Finance	Chicago
4	Marketing	Boston
5	Operations	Seattle
6	Legal	Washington D.C.
7	Sales	Dallas
8	R&D	Austin
9	Procurement	Denver
10	Customer Care	Miami

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2. Employees Table

emp_id	first_name	last_name	Email	phone	hire_date	job_title	salary	dept_id	manager_id
101	Alice	Johnson	alice.j@corp.com	123-456-7890	2020-03-15	HR Manager	75000	1	NULL
102	Bob	Smith	bob.s@corp.com	234-567-8901	2019-05-20	IT Analyst	65000	2	104
103	Charlie	Brown	charlie.b@corp.com	345-678-9012	2021-01-10	Finance Executive	58000	3	106
104	Diana	Prince	diana.p@corp.com	456-789-0123	2018-07-12	IT Manager	90000	2	NULL
105	Ethan	Hunt	ethan.h@corp.com	567-890-1234	2022-02-25	Marketing Lead	62000	4	NULL
106	Fiona	Hall	fiona.h@corp.com	678-901-2345	2017-11-01	Finance Manager	85000	3	NULL
107	Greg	Miles	greg.m@corp.com	789-012-3456	2023-04-15	IT Support	45000	2	104
108	Hannah	White	hannah.w@corp.com	890-123-4567	2021-09-05	HR Executive	50000	1	101
109	Ian	Scott	ian.s@corp.com	901-234-5678	2020-11-20	Operations Analyst	56000	5	NULL
110	Julia	Adams	julia.a@corp.com	012-345-6789	2019-12-18	Legal Advisor	70000	6	NULL

2. Projects Table

project_id	project_name	start_date	end_date	dept_id
201	Payroll System	2023-01-01	NULL	3
202	Website Upgrade	2023-02-10	NULL	2
203	Recruitment Drive	2023-03-05	NULL	1
204	Ad Campaign	2023-05-20	NULL	4
205	New CRM Tool	2023-04-15	NULL	7
206	Compliance Portal	2023-06-10	NULL	6
207	Inventory System	2023-07-01	NULL	5
208	AI Research	2023-08-05	NULL	8
209	Customer Feedback	2023-09-10	NULL	10
210	Procurement System	2023-10-01	NULL	9

3. Employee_Project Table

emp_id	project_id	hours_allocated
102	202	120
104	202	80
103	201	100
106	201	150
101	203	50
105	204	70
107	202	60
109	207	90
110	206	110
108	203	40

Section A: DDL (Schema Creation & Modification)

1. Write SQL statements to create the above tables with the specified constraints
2. Alter the Employees table to add a column bonus DECIMAL(8,2) with default value 0.
3. Drop the column bonus from Employees.

Section B: DML (Insert, Update, Delete)

4. Insert at least 10 rows into Departments, Employees, Projects, and Employee_Project.(use the above data set)
5. Try inserting an employee with a negative salary (should fail due to CHECK constraint).
6. Update the salary of the employee with emp_id = 103 by 15%.
7. Delete an employee record who has resigned (choose any emp_id).
8. Increase all employees' salaries in the IT department by 5%.
9. Change the department of an employee to "Research".(should fail due to FK constraint)

Section C: DQL (Select Queries)

10. List all employees and their details.
11. Show all employees in the "HR" department.
12. Find employees with salaries between 50,000 and 80,000.
13. Retrieve employees hired after 2020.
14. Show employees who are in either the IT or Finance department.
15. Find employees whose email ends with "@corp.com".
16. List all employees with salary > 60,000 AND located in "New York".
17. Display employees in descending order of salary.
18. Count the number of employees in each department.
19. Show the average salary of employees department-wise.
20. Display departments where the average salary is greater than 70,000.
21. Find the number of employees in each project.
22. Display departments with more than 3 employees.
23. Show the sum of all salaries department-wise.
24. List all distinct department IDs from the Employees table.
25. Show employee names with the year they were hired.
26. Show employees grouped by the year of hire.
27. List employees hired in the last 90 days.
28. List the no of years of experience of all the employees

Section D: Joins

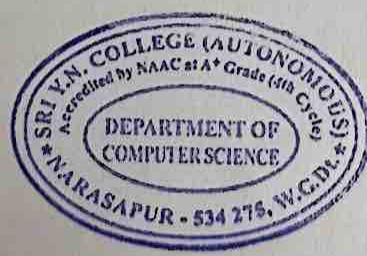
29. List all employees with their department names (INNER JOIN).
30. Display all departments along with employees, including those departments without employees (LEFT JOIN).
31. Show employees and the projects they are working on (JOIN 3 tables: Employees, Employee_Project, Projects).
32. List projects along with total hours allocated by employees.
33. Write a query to find employees who are working on more than one project.
34. Show all projects handled by the 'Finance' department.

Section E: PL/SQL Programming

1. Write a procedure GetEmpInfo that takes emp_id as input and displays name, salary, and department.
2. Write a PL/SQL block that checks if an employee's salary is above 50,000. If yes, print "High Salary" ;Otherwise print "Standard Salary".
3. Write a PL/SQL program to display the top 10 rows in the Emp table based on their job and salary
4. Write a stored procedure GiveBonus that takes department ID and a designation as input, along with a bonus amount, and updates the salary of all employees in that department who have the specified designation by adding the bonus amount to their current salary.
5. Create a trigger to prevent inserting employees with a salary less than 30,000.
6. Create a trigger to avoid any transactions(insert, update, delete) on EMP table on Saturday & Sunday.

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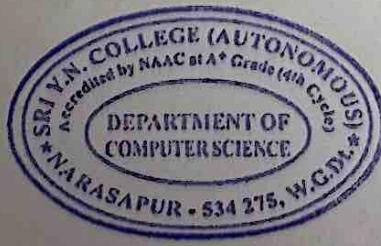
B.C.A II Year SEMESTER-III

(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

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B.C.A II Year SEMESTER-III
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MAJOR COURSE-5: DATA BASE MANAGEMENT SYSTEM

Theory

Credits: 3

3 hrs/week

Course Objectives:

- Graduates will have the expertise in analyzing real time problems and providing 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

- Database Management Systems, 3rd Edition, Raghurama Krishnan, Johannes Gehrke, TMH
- Database System Concepts, 5th Edition, Silberschatz, Korth, TMH *Ans*

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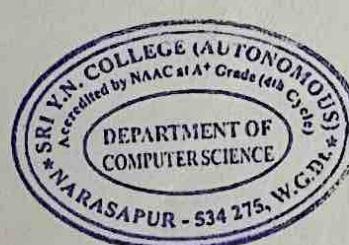
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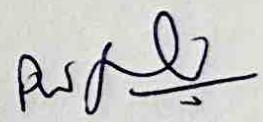
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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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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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MAJOR COURSE-5: DATA BASE MANAGEMENT SYSTEM LAB

Practical

Credits:1

2 hrs/week

List of Experiments

SOL:

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

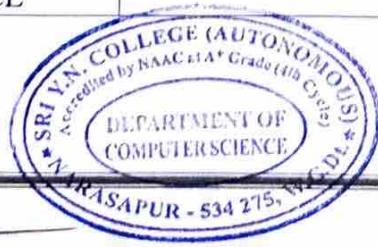
Description: Used to store product information

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

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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	Varchar2	20	
SAL_AMT	Number	8,2	Not null, cannot be 0
TGT_TO_GET	Number	6,2	Not null, cannot be 0
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 to Rs.3000.
5. List the names of all clients having 'a' as the second letter in their names.
6. List all clients whose BalDue is greater than value 1000.
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 1000 and less than or equal to 3000.
10. Find the products whose selling price is greater than 1000 and also find the new selling price as original selling price 0.50.

Cycle-II Supplier

Aim: A manufacturing company deals with various parts and various suppliers supply these parts. It consists of three tables to record its entire information. 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. List the name, salary and PF amount of all the employees (PF is calculated as 10% of salary)
4. List the names of employees who are more than 2 years old in the organization.
5. Determine the number of employees, who are taking commission.
6. Update the employee salary by 20%, whose experience is greater than 12 years.
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 decided to raise the employee salary by 15% 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/SQL program to display top 10 rows in Emp table based on their job and salary.
4. Write a PL/SQL program to raise the employee salary by 10% for department number 30 people and also maintain the raised details in the raise table.
5. Create a procedure to update the salaries of Employees by 20%, 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-III

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

MAJOR COURSE-6: DATA STRUCTURES

Theory

Credits: 3

3 hrs/week

Course Objectives:

- The objective of the course is to make a student to implement data structures and 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, Data Structure Operations, Algorithms: Complexity, Time-Space Tradeoff.

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

Linked Lists – Representation, Dynamic Memory Allocation, 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 Wesley.
4. Data Structures Using C, Reema Thareja, oxford.

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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. D. S.
L. P. S.
M. K.




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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

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 insertion 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.~~ *pwf*

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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, "Programming with Java", TataMc-GrawHill, 5th Edition.

REFERENCES:

1. Herbert Schildt, "The complete reference Java", TataMc-GrawHill, 7th Edition.

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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-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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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 LAB

Practical

Credits: 1

2 hrs/week

List of Lab Experiments

- 1 Write a program to print Biggest of 3 Numbers 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 Write a program that import the user define package and access the member variable of classes that contained by package.
- 9 Write a program that show the implementation of interface.
- 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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A. F. L.
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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

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. Sommerville 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
I	2(Section-I)	2(Section-III)
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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-III

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

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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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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B. Baruva
K. Paresh
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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 theories of learning.

UNIT-II: GROUP DYNAMICS

Meaning of groups and group dynamics, Stages in the Formation of groups, Characteristics and Types of groups. Factors influencing group effectiveness-

Group cohesiveness, Group decision making. Teams-Groups Vs Teams, Types of teams. Conflicts in groups- reasons for conflicts, Management of Conflict-application of Transactional Analysis, Johari Window.

UNIT-III: LEADERSHIP

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..

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UNIT-V:ORGANIZATIONAL CULTURE

Concept of Organizational Culture, Significance of understanding organizational culture, Distinction between organizational culture and organizational climate. Factors influencing Organizational Culture. Organizational Effectiveness-

Indicators of organizational effectiveness, achieving organizational effectiveness..

Reference Books:

1. Robbins, P. Stephen-O B-Concepts, Controversies & Applications-Prentice Hall of India Ltd., New Delhi.
2. Luthans Fred-Organizational Behaviour-McGraw Hill Publishers Co. Ltd., New Delhi,
3. Rao, VSP and Narayana, P. S.-Organization Theory & Behaviour-Konark Publishers Pvt. 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 organisational 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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For all II B.Sc./B.Com./B.A./BCA/BBA/B.Voc/ Life Sciences Major and Minor Programs

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, eeacharya, 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.

GUIDELINES TO THE PAPER SETTER

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

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*K.N.
Chile
B.Morjaria
Z.Paelkar
Holl*



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For all II B.Sc./B.Com./B.A./BCA/BBA/B.Voc/ Life Sciences Major and Minor Programs

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. $3 \times 10 = 30 M$

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**

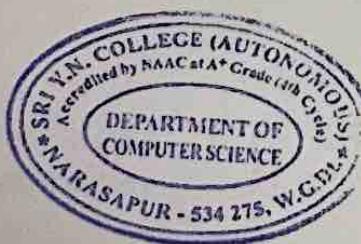
SECTION – II

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

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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Bosuwa
L. Jaffer
Hill*



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(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-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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*K.C. Celia
B. Narsapur
L. Paresh
H. H.*



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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. Mark Lutz, Learning Python, 5th Ed. 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 Reema Thareja.
5. Albert Lukaszewski, MySQL for Python, Packt Publishing

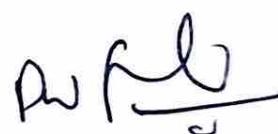
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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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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 a program to enter names of employees and their salaries as input and store them in a 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 matplotlib.
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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Keerthi

Meenang

L. Paresh

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DEPARTMENT OF COMPUTER SCIENCE

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.

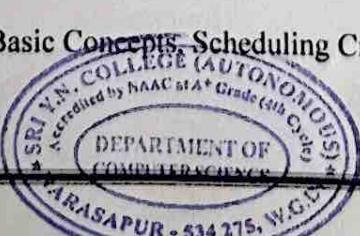
Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms,

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2023-24

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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 Silberchitz, PeterB.Galvin, Greg Gagne 8th Edition, 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

GUIDELINES TO THE PAPER SETTER

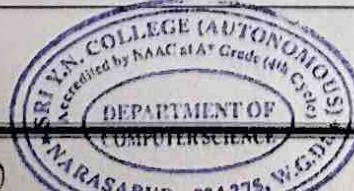
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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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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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B.C.A II Year SEMESTER-IV

(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 on basic UNIX Commands.
4. Write a program using the following system calls of UNIX OS for fork, 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. Brian W. Kernighan and Rob Pike, "The UNIX Programming Environment" Prentice Hall India (Edition available in LRC and in the form of EBook on student resource).
2. Yashwant Kanetkar, "UNIX Shell Programming" BPP Publications (First Edition).

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S. Parwya
S. Palle



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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

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

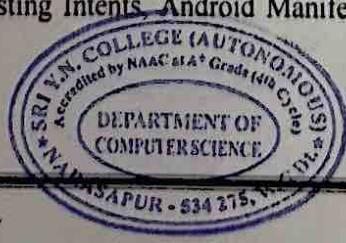
Introduction to Android: - Features of Android, The Android Platform, Understanding the Android Software Stack – Android Application Architecture –The Android Application Life Cycle – Creating Android Activity -Views- Layout Android SDK, Android Installation, Building you First Android application,

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.

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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:1
4. "Android", Dixit, Prasanna Kumar Vikas Publications, New Delhi 2014,
ISBN: 9789325977884
5. Maclean David, Komatineni Satya, Allen Grant, "ProAndroid5", Apress Publications 2015
ISBN: 978-1-4302-4680-0
6. "Android Programming for Beginners" by Hortan, John, Packt Publication, 2015
ISBN: 978-1-78588-326-2
7. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)

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K. Jagade*



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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.html> (Available in the form of free downloadable 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.html> Syllabus of BCA (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>

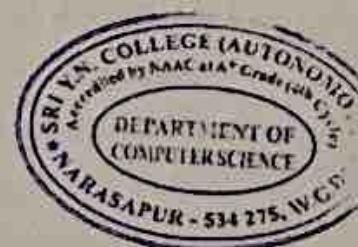
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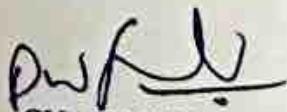
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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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DEPARTMENT OF COMPUTER SCIENCE

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

MAJOR COURSE-II: MOBILE APPLICATION DEVELOPMENT USING ANDROID

Max Marks: 60

Time: 3 Hours

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

(5X8=40Marks)

Section - I

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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*Dr. S. Venkateswaran
L. P. Patel
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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 window using above UI 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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*W. C. Achrekar
B. M. Donya*

*L. Palu
M. Chenni*



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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.New Product Development process, Product Life Cycle– Stages in PLC and application to marketing. Product Mix and Product Lines- Branding of Products, Packaging, Labeling ,Warranties & Guarantees.

UNIT-IV:PRICING AND DISTRIBUTION

Pricing-Factors influencing pricing decisions, objectives of pricing. Pricing policies and methods,

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

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UNIT-V: PROMOTION

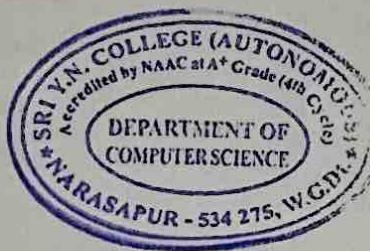
Integrated Marketing Communication, Process of IMC. Elements of Promotional Mix- Advertising, Publicity, Public Relations, Personal Selling, and Sales promotion. Significance of Promotional Mix in marketing decisions.

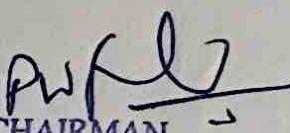
Reference Books:

1. Kotler.P,&Keller.K.L.,Koshy&Jha(2020).Marketing Management,20th edition, Pearson.
2. Ramaswamy&Nmakumary-Marketing Management-Global Perspective-Indian Context- MacMillon India Ltd.
3. Saxena, Rajan, Marketing Management, Tata-Mc Graw Hill, New Delhi.
4. S.A.Sherlekar,R.Krishnamoorthy,Marketing Management,Himalaya Publishing House

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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)

Time: 3 Hours

Max. Marks: 60

PART-I

Answer any FIVE questions from the following.

$$5 \times 4 = 20 \text{M}$$

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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M. Kanishk



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DEPARTMENT OF COMPUTER SCIENCE

B.C.A II Year SEMESTER-IV

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

MINOR COURSE-4: HUMAN RESOURCE MANAGEMENT

(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.

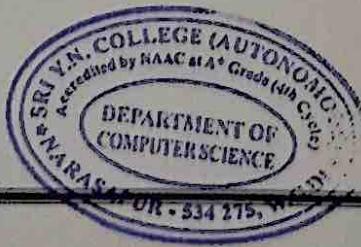
Unit-III: Training and Development:

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.

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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, New Delhi.
2. Biswajeet P. Pattnayak, 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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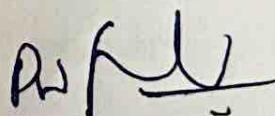
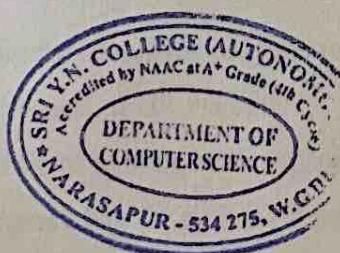
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B.C.A II Year SEMESTER-IV

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

MINOR COURSE-4: HUMAN RESOURCE MANAGEMENT

(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

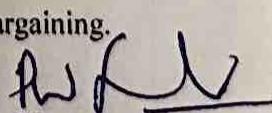
14. Explain briefly the significance of Human Resource Management
15. Enumerate the various Selection Methods
16. What is Management Development? Explain the techniques of Management Development Programmes?
17. Define Compensation? What are the methods of Wage & Salary Fixations?
18. What are the conditions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

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K. Paule
M. Kanishka




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B.C.A III Year SEMESTER-V

(w.e.f. 2021 Admitted Batch)

S. NO	Course	Name of the subject	Total Marks	Mid. Sem. Exam	Sem. End. Exam	Teaching Hours	Credits
1	Course-12	Major-12: Web Programming	100	40	60	3	3
		Web Programming Lab	50	-	50	2	1
2	Course -13	Major-13: Web Development PHP & MYSQL	100	40	60	3	3
		Development PHP & MYSQL Lab	50	-	50	2	1
3	Course -14	Major-14: Cloud Computing	100	40	60	3	3
		Cloud Computing Lab	50	-	50	2	1
4	Course-15	Major-15: Foundation of Data Science	100	40	60	3	3
		Foundation of Data Science Lab	50	-	50	2	1
4	Minor-5	Financial Management	100	40	60	5	4
5	Minor-6	Managerial Communication	100	40	60	5	4
6	Common value added course	Environmental Education	50	-	50	2	2
Total			850	240	610	32	26

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B.C.A III Year SEMESTER-V

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

MAJOR COURSE-12: WEB PROGRAMMING

Theory

Credits: 3

3 hrs/week

Course Objectives:

1. Learn the basics of creating a website.
2. Understand HTML5 coding conventions
3. Understand the philosophy of how HTML and CSS should fit together
4. Learn how Java Script came to be.

Course Outcomes: Upon Completion of the course, the students will be able to

1. Understand the Web Design Process.
2. Apply the HTML tags, elements and attributes
3. Apply different types of HTML elements
4. Use of organization all elements, tables and images
5. Use of audio, video files
6. Apply java Script concepts

Unit-I:

Introduction to Web Programming: Introduction, creating a website, HTML tags, HTML Elements, HTML attributes, CSS Preview, History of HTML, Differences between old HTML and HTML5, how to check your HTML code

Unit-II:

Coding Standards, Block Elements:

HTML coding conventions, Comments, HTML Elements, Should Describe Web Page Content Accurately, Block Elements, block quote Element, Whitespace Collapsing, pre Element, Phrasing Elements, Editing Elements, q and cite Elements, dfn, abbr, and time Elements, Code-Related Elements, br and wbr Elements.

Text Elements, and Character References: sup, sub, s, mark, and small Elements, strong, em, b, u, and i Elements, span Element, Character References, Web Page with Character References, and Phrasing Elements.

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Unit-III:

Cascading Style Sheet(CSS) : CSS Overview, CSS Rules, Example with Type Selectors and the Universal Selector, CSS Syntax and Style, Class Selectors, ID Selectors, span and div Elements, Cascading, style Attribute, style Container, External CSS Files, CSS Properties, Color Properties, RGB Values for Color, Opacity Values for Color, HSL and HSLA Values for Color, Font Properties, line-height Property, Text Properties, Border Properties, Element Box, padding Property, margin Property.

Unit-IV:

Organizing a Page's, Content with Lists, Figures, and Various, Organizational Elements: List, Descendant selector, Figure with picture and caption, Organizational elements, Navigation bar, Header and Footer, User agent style sheet.

Tables and CSS Layout: Data tables vs Layout tables, Table elements, Form at table

Links and Images: Implement a link with the a element, different types of href attribute Values, relative URLs, Implement a link that jumps to a particular location within a web page, element's target attribute, Understand the concepts behind GIF, JPEG, and PNG bitmap image formats.

Unit-V:

Image Manipulations, Audio and Video: Position an image, how to display a shortcut icon in a browser's tab area, iframe, Create an image sprite file, Implement an audio player using the audio element, Handle different audio file formats, Cover a web page's background with an image, web fonts, Implement a video player using the video element.

Introduction to JavaScript: Button control with an event Handler, Syntax rules for functions, variables, identifiers, and assignments, Document Object Model(DOM).

Prescribed Text Books:

1. Web Programming with HTML5, CSS and Java Script, John Dean,Jones&Bartlett Learning

Reference Text Books:

1. HTML & CSS: The Complete Reference, 5th Edition, Thomas.A. Powell

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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 III Year SEMESTER-V

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

MAJOR COURSE-12: WEB 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. What is HTML? Explain about structure of HTML with example.
2. What are HTML tags and attributes? Explain with examples.
3. Compare and contrast block elements and phrasing elements in HTML with suitable examples.
4. Explain the use of the <q>, <blockquote>, and <cite> tags with examples.
5. What are character references in HTML? Write any five and explain their use.

Section – II

6. What is CSS? Explain CSS syntax and write an example using type selectors and the universal selector.
7. What is the cascade in CSS? Explain how CSS applies rules when multiple styles are defined.
8. Explain the different types of HTML lists. Write HTML examples for ordered and unordered lists.
9. Describe the use of semantic structural tags like <header>, <footer>, and <nav> in designing a web page.
10. Explain how to display a shortcut icon (favicon) in a browser tab. Include the HTML code required.

Section – III

(5X4=20Marks)

Answer any five questions from the following.

11. What is Web Programming?
12. Write any two HTML tags.
13. What is the use of the <pre> tag?
14. Write the RGB value for the color black.
15. What does the color property do in CSS?
16. What is the purpose of the <nav> tag?
17. What is an image sprite?
18. Which HTML tag is used to play audio files?

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

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

MAJOR COURSE-12: WEB PROGRAMMING LAB

Practical

Credits: 1

2hrs/week

Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Create web pages using HTML.
2. Apply different styles to HTML page.
3. Work with different scripting elements.

WEEK-1

1. Write an HTML code to display your education details in a tabular format.
2. Write an HTML code to display your CV on a web page.

WEEK-2

1. Create a webpage with HTML describing your department. Use paragraph and list tags.
2. Apply various colors to suitably distinguish keywords. Also apply font styling like italics, underline and two other fonts to words you find appropriate. Also use header tags.
3. Create links on the words e.g. "Wi-Fi" and "LAN" to link them to Wikipedia pages.
4. Insert an image and create a link such that clicking on image takes user to other page.
5. Change the background color of the page. At the bottom create a link to take user to the top of the page.

WEEK-3

1. Create a table to show your class time-table.
2. Use tables to provide layout to your HTML page describing your university infrastructure.
3. Use and tags to provide a layout to the above page instead of a table layout.
4. Use frames such that page is divided into 3 frames 20% on left to show contents of pages, 60% in center to show body of page, remaining on right to show remarks.
5. Embed Audio and Video in to your HTML webpage.

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WEEK-4

1. Write an HTML code to illustrate the usage of the following:
 - Ordered List
 - Unordered List
 - Definition List

WEEK-5

1. Write an HTML code to create a frameset having header, footer, and navigation and content sections.

WEEK-6

1. Write an HTML code to demonstrate the usage of inline CSS.
2. Write an HTML code to demonstrate the usage of internal CSS.
3. Write an HTML code to demonstrate the usage of external CSS.

WEEK-7

1. Create a form similar to the one in previous experiment. Put validation check on values entered by the user using JavaScript (such as age should be a value between 1 and 150).
2. Write a Java Script program to display information box as soon as page loads.
3. Write a Java Script program to change background color after 5 seconds of page load.
4. Write a Java Script program to dynamically bold, italic and underline words and phrases based on user actions.
5. Write a Java Script program to display a hidden div (e.g. showing stats of a player when user clicks on his name)
6. Write a Java script to prompt for user's name and display it on the screen.
7. Design HTML form for keeping student record and validate it using Java script.
8. Write programs using Java script for Web Page to display browser's information.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

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

MAJOR COURSE-13: WEB DEVELOPMENT USING PHP & MYSQL

Theory

Credits: 3

3 hrs/week

Course Outcomes: Upon Completion of the course, the students will be able to

1. Write simple programs in PHP.
2. Understand how to use regular expressions, handle exceptions, and validate data.
3. Apply In-Built functions and Create User defined functions in PHP programming.
4. Write PHP scripts to handle HTML forms.
5. Write programs to create dynamic and interactive web-based applications using PHP and MYSQL.
6. Know how to use PHP with MySQL DB and can write database driven web pages.

Unit-I:

Using PHP: PHP Basics: Accessing PHP, Creating Sample Application, Embedding PHP in HTML, Adding Dynamic Content, Identifiers, Variables, Constants, Operators, Data types, Accessing Form Variables, Variable handling Functions, Making Decisions with Conditions.

Storing and Retrieving Data: Processing Files, opening a File, writing to a File, closing a File, Reading from a File, Other File Functions, Locking Files.

Unit-II:

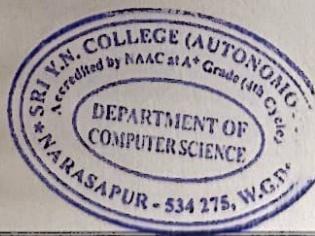
Arrays: Arrays basics, Types, Operators, Array Manipulations.

String Manipulation and Regular Expressions: Strings Basics, Formatting Strings, Joining and Splitting Strings with String Functions, Comparing Strings, Matching and Replacing Substrings with String Function, Introducing Regular Expressions, Find, Replace, Splitting in regular Expressions.

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T. Palu*

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Unit-III:

Reusing Code and Writing Functions: The Advantages of Reusing, Using require () and include (), Using Functions in PHP, Scope, and Passing by Reference Versus Passing by Value, keyword, Recursion.

Object-Oriented PHP: OOP Concepts, Creating Classes, Attributes, and Operations in PHP, Implementing Inheritance in PHP, Understanding Advanced Object-Oriented Functionality in PHP.

Unit-IV:

Using MySQL: Relational Database Concepts, Web Database Architecture, Introducing MySQL's Privilege System, Creating Database Tables, Understanding MySQL, Identifiers, Database Operations, querying a Database, Understanding the privilege System, Making Your MySQL Database Secure, Optimization, Backup, Restore.

Unit-V:

Introduction of Laravel PHP Framework: Why Laravel, setting up Laravel Development Environment, Routing and Controllers: introduction to MVC, the HTTP verbs, and REST, Route Definitions, Route Groups, Signed Routes, Views, Controllers.

Prescribed Text Books:

1. Luke Welling ,Laura Thomson, " PHP and MySQL Web Development", 5th Edition
2. Matt Stauffer, "Laravel:Up&Running", 2nd Edition
3. Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, (2007).
4. Steven Holzner ,PHP: The Complete Reference, McGraw-Hill
5. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS&HTML5, Third Edition O'reilly, 2014
6. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).

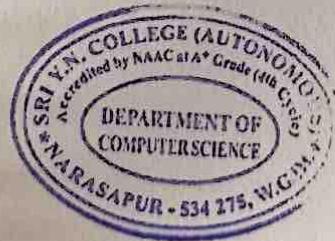
7. Web resources:

<http://www.codecademy.com/tracks/phhttp://w>
<http://www.w3schools.com/PHPhhttp://www.tutorialpoin>
nt.com

Other web sources suggested by the teacher concerned and the college librarian including reading material.

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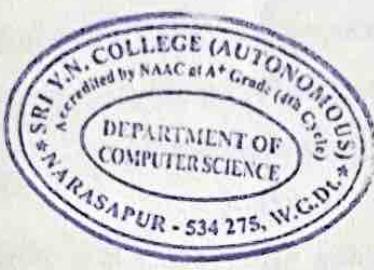
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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

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

MAJOR COURSE-13: WEB DEVELOPMENT USING PHP&MYSQL

Theory

Credits: 3

3 hrs/week

Answer any FIVE questions choosing at least TWO questions from Sections I&II (5X8=40Marks)

Section-I

1. Explain PHP data types, usage of variables and constants.
2. Describe the process of file handling in PHP.
3. Explain types of arrays and array manipulation techniques in PHP.
4. Explain string manipulation in PHP with string functions.
5. Explain the use of regular expressions in PHP.

Section-II

6. Discuss the concept of Scope in PHP with examples.
7. What is inheritance? How it is implemented in PHP?
8. Describe relational database concepts.
9. Explain steps for creating, querying, and optimizing MySQL database.
10. Write about MVC.

Section-III

Answer any five questions from the following.

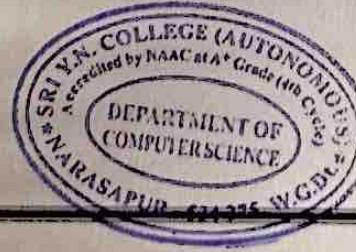
(5X4=20Marks)

11. Write about identifiers in PHP
12. Write about operators in PHP.
13. Write about string basics in PHP.
14. State the advantages of reusing code in PHP.
15. Write about creating classes in PHP
16. Write a short note on MySQL privilege system.
17. Write about the Laravel development environment.
18. Write about HTTP verbs in Laravel.

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S. S. S. S.
H. Ganesh



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

MAJOR COURSE-13: WEB DEVELOPMENT USING PHP&MYSQL

Practical

Credits: 1

2hrs/week

Course Outcomes: On successful completion of this practical course, student shall be able to:

- Write, debug, and implement the Programs by applying concepts and error handling techniques of PHP.
- Create an interactive and dynamic website.
- Create a website with reports generated from a database.
- Create an interactive web site for e-commerce sites like online shopping, etc.

WEEK-1

1. Write a PHP program to Display "Hello", and today's date.
2. Write a PHP program to display Fibonacci series.
3. Write a PHP Program to read the employee details.

WEEK-2

4. Write a PHP program to prepare the student marks list.
5. Write a PHP program to generate the multiplication of two matrices.
6. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.

WEEK-3

7. Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
8. Write PHP script to demonstrate passing variables with cookies.
9. Write a program to keep track of how many times a visitor has loaded the page.

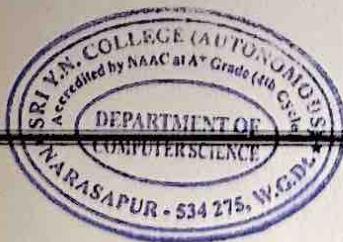
Write a PHP application to add new Rows in a Table

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WEEK-4

10. Write a PHP application to add new Rows in a Table.
11. Write a PHP application to modify the Rows in a Table.
12. Write a PHP application to delete the Rows from a Table
13. Write a PHP application to fetch the Rows in a Table.

WEEK-5

14. Develop an PHP application to implement the following Operations. Registration of Users. Insert the details of the Users. Modify the Details. Transaction Maintenance. No of times Logged in Time spent on each login. Restrict the user for three trials only.

Delete the user if he spent more than 100 Hrs of transaction.

WEEK-6

15. Write a PHP script to connect MySQL server from your website.

WEEK-7

16. Write a program to read customer information like cust-no, cust-name, item purchased, and mob- no, from customer table and display all these information in table format on output screen.

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DEPARTMENT OF COMPUTER SCIENCE



B.C.A III Year SEMESTER-V

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

MAJOR COURSE-14: CLOUD COMPUTING

Theory

Credits: 3

3 hrs/week

Course Objectives:

1. This course introduces the basic principles of cloud computing, Cloud Computing models and Services, Virtualization Techniques, Resource Sharing, Load Balancing and Security issues in Cloud Computing.
2. It will also equip the students to understand major industry players in the public cloud domain.

Course Outcomes: Upon Completion of the course, the students will be able to

1. Understand the basic principles of cloud computing.
2. Analyze different types of cloud services – Cloud Computing Models and Cloud Computing Services.
3. Understand Virtualization techniques
4. Use different Cloud Platforms
5. Learn different File systems and Security issues in Cloud Computing Platforms

Unit-I: Introduction to Cloud Computing, Evaluation and Enabling technologies, Benefits and Challenges, Cloud Computing Model.

Unit-II: Cloud Computing Services, Elements of Cloud Security model, Cloud Security reference model, Examining Cloud Security against traditional computing, Security Policy.

Unit-III: Virtualization basics, Machine or Server Level Virtualization, Major Server Virtualization Products and Vendors, Types of Virtualization, Advantages and Disadvantages of Virtualization, Virtualization Security Threats.

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Unit-IV: Resource Pooling and Sharing, Multi-tenancy, Resource Provisioning, Scaling, Types of Scaling, Load balancing in Cloud, Categories of Load Balancing, Service Oriented Architecture (SOA), Elements of a Service, Benefits of SOA.

Unit-V: Cloud Native File System, Storage types, Relational DBMS in Cloud, Non-Relational DBMS in Cloud, Cloud Security, Infrastructure Security in Cloud, Information Security in Cloud.

Prescribed Text Books:

1. Cloud Computing : Sandeep Bhowmik, Cambridge University Press
2. CLOUD COMPUTING: Principles and Paradigms by Rajkumar Buyya, James Broberg, Andrzej Goscinski
3. The Definite Guide to Cloud Computing by Dan Sullivan

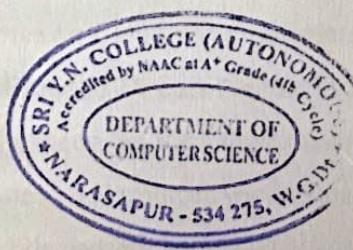
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V	1(Section-II)	2(Section-III)

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B.C.A III Year SEMESTER-V

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

MAJOR COURSE-14: CLOUD COMPUTING

Theory

Credits: 3

3 hrs/week

Answer any FIVE questions choosing at least TWO questions from Sections I&II

Section – I **(5X8=40Marks)**

1. Explain the Evaluation and Enabling Technologies in Cloud Computing.
2. Explain Benefits and Challenges of Cloud Computing in modern IT Environments.
3. Explain about Cloud Computing Services.
4. Briefly Discuss about Elements of a Cloud Security Model.
5. Differentiate Traditional Computing and Cloud Security.

Section – II

6. Explain about Major Server Virtualization Products and Vendors.
7. Explain the Types of Virtualization with examples.
8. Explain Resource Pooling and Multi tenancy in Cloud Computing.
9. Discuss the Concepts of Scaling and Load Balancing in Cloud.
10. Explain Cloud Security in detail.

Section – III **(5X4=20Marks)**

Answer any five questions from the following.

11. Define Cloud Computing. List 4 characteristics of Cloud Computing.
12. Write short notes on Cloud Computing Model.
13. Write short notes on Cloud Security Reference Model.
14. Define Virtualization? Discuss the role of Hypervisor.
15. Differentiate between the Virtualization and Cloud Computing.
16. Write short notes on Resource Provisioning.
17. Cloud Native File System.
18. Relational DBMS in Cloud.

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B. D. Nayak*

*L. Paeline
M. H.*



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B.C.A III Year SEMESTER-V

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

MAJOR COURSE-14: CLOUD COMPUTING

Practical

Credits: 1

2hrs/week

Course Outcomes: Upon Completion of the course, the students will be able to

1. Working with Virtual machines.
2. Run simple programs on virtual box.
3. Acquire knowledge in Google App Engine
4. Get practical exposure on Cloud Sim

Experiments:

1. Install Virtual box/VM ware Work station with different flavor so Linux or windows OS on top of windows10 or 11.
2. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs
3. Install Google App Engine. Create hello world append other simple web applications using python /java.
4. Use GAE launcher to launch the web applications.
5. Simulate a cloud scenario using Cloud Sim an drun a scheduling algorithm that is not present in Cloud Sim.
6. Find a procedure to transfer the files from one virtual machine to another virtual machine.
7. Find a procedure to launch virtual machine using try stack(Online Open stack Demo Version)

Web Resources:

Cloud Computing Fundamentals Labs –Cloud Academy

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DEPARTMENT OF COMPUTER SCIENCE



B.C.A III Year SEMESTER-V

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

MAJOR COURSE-15: FOUNDATIONS OF DATA SCIENCE

Theory

Credits: 3

3 hrs/week

Course Objectives:

1. To understand the data science fundamental sand process.
2. To learn to describe the data for the data science process.
3. To learn to describe the relationship between data.
4. To utilize the Python libraries for Data Wrangling.
5. To present and interpret data using visualization libraries in Python

Course Outcomes: Upon Completion of the course, the students will be able to

1. Define the Data Science
2. Understand the Flow of Data science
3. Identify different steps in Data Science
4. Learn the Ipython basics
5. Learn data loading and manipulation techniques
6. Work with different data visualization techniques

Unit-I:

Benefits and uses of data science and big data, the big data eco system and data science, the data science process: Overview of data science process, Different steps in data science process: Research Goal, Retrieving data, Cleansing, integrating and transforming data, Exploratory data analysis, Build the models, Presenting findings and building applications

Unit-II:

IPython: Beyond Normal Python, Shell or Notebook?, Launching the IPython Shell, Launching the Jupyter Notebook, Help and Documentation in IPython, Accessing

Documentation with?, Accessing Source Code with?, Exploring Modules with Tab Completion, Keyboard Shortcuts in the IPython Shell, IPython Magic Commands, Input and Output History, Underscore Shortcuts and Previous Outputs, Suppressing Output, IPython and Shell Commands,

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T. C. Cecil

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K. Jaeline
H. Kamishle*



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Shell Commands in IPython, Passing Values to and from the Shell, Shell-Related Magic Commands, Errors and Debugging, Profiling and Timing Code,

Unit-III:

Introduction to NumPy: Data Types in Python, Python List, Fixed-Type Arrays in Python, Creating Arrays from Python Lists, Creating Arrays from Scratch, NumPy Standard Data Types, The Basics of NumPy Arrays, NumPy Array Attributes, Array Indexing: Accessing Single Elements, Array Slicing: Accessing Sub arrays, Reshaping of Arrays, Array Concatenation and Splitting, Exploring NumPy's UFuncs, Aggregation functions

Unit-IV:

Data Manipulation with Pandas: Installing and Using Pandas, Introducing Pandas Objects, The Pandas Series Object, The Pandas Data Frame Object, The Pandas Index Object, Data Indexing and Selection, Data Selection in Data Frame, Operating on Data in Pandas, Handling Missing Data, Operating on Null Values, Combining Datasets: Concat and Append, Combining Datasets: Merge and Join, Working with Time Series

Unit-V:

Visualization with Matplotlib: Importing matplotlib, Setting Styles, Plotting from a script, Plotting from an IPython shell, Plotting from an IPython notebook, Saving Figures to File, Two Interfaces for the Price of One, Simple Line Plots, Adjusting the Plot: Line Colors and Styles, Adjusting the Plot: Axes Limits, Labeling Plots, Simple Scatter Plots, Density and Contour Plots, Histograms, Binnings, and Density, Customizing Matplotlib: Configurations and Style sheets, Geographic Data with Basemap, Visualization with Seaborn, Other Python Graphics Libraries

Prescribed Text Books:

1. Introducing Data Science: BIGDATA, MACHINELEARNING, ANDMORE, USING PYTHON TOOLS by DAVY CIELEN, ARNO D. B. MEYSMAN, MOHAMED ALI
2. Python Data Science Handbook Essential Tools or Working with Data by JakeVanderPlas
3. R for Data Science Import, Tidy, Transform, Visualize, and Model Data by Hadley Wickham and Garrett Grolemund
4. Data Science using Python and R by C.D Larose and D.T.Larose
5. Mathematical Foundations of Data Science Using R by Frank Emmert-Streib, Salissou Moutari, and Matthias Dehmer

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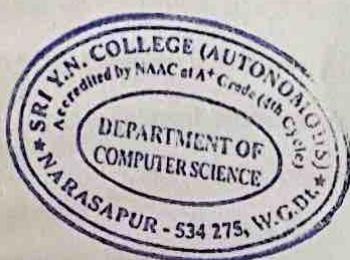
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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

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

MAJOR COURSE-15: FOUNDATIONS OF DATA SCIENCE

Theory

Credits: 3

3 hrs/week

Answer any FIVE questions choosing at least TWO questions from Sections I&II

Section-I

(5X8=40Marks)

1. Explain the Data Science Process in Detail.
2. Write notes on Cleansing, Integrating and Transforming Data.
3. Explain steps involved in launching IPython Shell.
4. Explain various keyboard shortcuts in IPython.
5. Write notes on IPython Shell Commands.

Section-II

6. Explain Various Data Types in Python.
7. Write about NumPy Arrays in detail.
8. Explain various Pandas Objects.
9. Write notes on Combining Datasets.
10. Explain various types of Plots.

Section-III

Answer any five questions from the following.

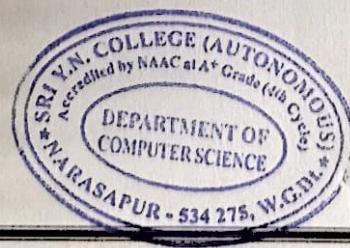
(5X4=20Marks)

11. Write short notes on Big data Eco system.
12. Briefly explain various building models.
13. Explain Jupyter Notebook
14. Explain NumPy Standard Data Types
15. Describe Aggregation functions.
16. Discuss Operating on Data in Pandas.
17. Write about IPython notebook.
18. Describe Histograms.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

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

MAJOR COURSE-15: FOUNDATIONS OF DATA SCIENCE

Practical

Credits: 1

2hrs/week

Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Execute python basic programs.
2. Work with Python IDEs.
3. Gain practical knowledge on different python libraries.

Implement the lab experiments in Python with any real time example

1. Introduction to programming with Python.
2. Python programming basics
3. Conditional statements
4. Loops
5. Functions
6. Integrated Development Environments (IDEs).
7. How to structure Python code in a project.
8. How to manage libraries in Python using virtual environments.
9. Data Loading, Storage, and File Formats.
10. Data Cleaning and Preparation.
11. Data Manipulation with Pandas.
12. Data Wrangling: Join, Combine, and Reshape.
13. Plotting and Visualization.

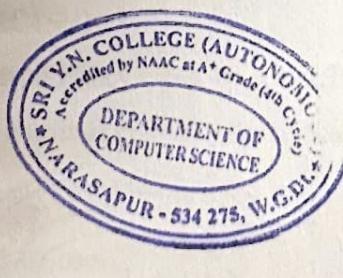
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M. Kanishka



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B.C.A III Year SEMESTER-V

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

MINOR COURSE-5: FINANCIAL MANAGEMENT

Theory

Credits: 4

5 hrs/week

Course objectives:

- To gain basic knowledge of financial management
- To evaluate the capital budgeting process and risk analysis in capital budgeting
- Familiarize different financial decision that help the organisation
- Learn types of dividend policies and their valuation
- Knowledge regarding working capital management, uses to organisation and valuation of working capital

UNIT 1: INTRODUCTION:

Nature, Scope and Objectives of Financial Management: Functions of Finance - Profit Maximization vs. Wealth Maximization – Role of Financial Manager in Modern Business Organizations – Risk - Return Trade off.

UNIT 2: INVESTMENT DECISION:

Capital Budgeting process – Cash Flow Estimation and measurement – Investment criterion – Methods of appraisal: Traditional Techniques and Discounted Cash Flow Methods - Capital rationing .

UNIT 3: FINANCING DECISIONS:

Concept of leverage – Types of Leverages –EBIT – EPS Analysis – Capital Structure – Determinants - Theories – Net Income approach – Net operating income approach – Traditional view – MM Hypothesis. Cost of Capital: Types of Cost of Capital - Weighted average Cost of capital.

UNIT 4: DIVIDEND DECISIONS:

Kinds of dividends, Dividend Policy types, Dividend Theories - Walter's Model - Gordon's Model - M- M Hypothesis - Retained Earnings Policies - Bonus Shares.

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K. Venkatesulu
B. Balaji
K. Palani

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UNIT 5: WORKING CAPITAL MANAGEMENT:

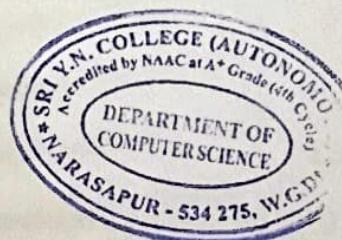
Concepts of working capital – Determinants of Working capital – Optimum level of Current assets – Liquidity Vs. Profitability – Risk – Return tangle – Estimating working capital needs – Financing strategies of working capital – Inventory Management – Inventory Control Techniques - Receivables Management - Cash Management.

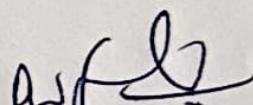
Reference Books:

1. Brearley, Richard and Myers, Steward: Principles of Corporate Finance, New York, McGraw Hill.
2. Soloman, Ezra, Theory of Financial Management, Columbia Press.
3. James C. Van Horne, Financial Management and Policy, Prentice Hall of India.
4. Weston J. Fred and Brigham, Eugne F., Managerial Finance, Dryden Press.
5. Prasanna Chandra, Financial Management, Tata McGraw Hill.
6. Khan, M.Y. and Jain, Financial Management, Tata McGraw Hill.

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L. Paeline
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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

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

MINOR COURSE-5: FINANCIAL MANAGEMENT

Time: 3 Hours

Max.Marks: 60

PART-I

Answer any **FIVE** questions from the following.

5X4=20M

1. Scope of Financial Management
2. Payback period
- 3 Net Income Approach
4. Dividend decision
5. Concept of Working Capital
6. Objectives of Financial Management
7. Capital Rationing
8. Working capital cycle

PART-II

Answer any **FIVE** of the following by selecting at least **TWO** from each Section

5X8=40M

SECTION-A

9. Analyze the profit maximization Vs wealth maximization.
10. Define capital budgeting? Explain the methods of capital budgeting.
11. Define capital structure and explain the determinants of capital structure.
12. Explain the dividend theories.
13. Discuss the determinants of working capital.

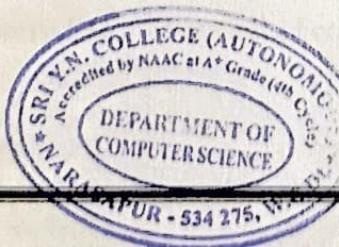
SECTION-B

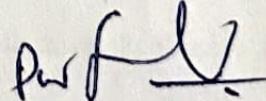
14. Describe the role of Financial Manager in modern business organizations
15. What is meant by risk analysis and explain the risk analysis of capital budgeting
16. Describe the cost of capital along with its types
17. Explain the retained earnings policies
18. Describe the financial strategies of working capital.

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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

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

MINOR COURSE-6: MANAGERIAL COMMUNICATION

Theory

Credits: 4

5 hrs/week

COURSE OBJECTIVES:

1. To help the students understand the principles of business communication.
2. To make the students aware of various types of types of communication.
3. To develop awareness on the role of various communication methods.
4. To make students understand business correspondence etiquettes.
5. To enable the students understand the importance of technology related to communication for addressing the business audience.

UNIT-I: CONCEPTS OF COMMUNICATIONS

Definition, Role of Communication in Business, Objectives of Communication. Process of Communication, Forms of communication- Written, Oral and non-verbal Communication, significance of non-verbal communication., effective Listening.

UNIT-II: ORGANIZATIONAL COMMUNICATION

Formal and Informal Communication, styles of Communication, Barriers to Communication Gateways to Effective Communication, ,

UNIT-III: INTERPERSONAL COMMUNICATION

Significance of Interpersonal Communication-Role of Perception, Emotion and motivation in Inter Personal Communication. Models for Inter Personal Communication –, Johari Window and Transactional Analysis.

UNIT-IV: BUSINESS CORRESPONDENCE SKILLS

Significance of Business Correspondence, essentials of effective Business Correspondence, Business Letter and Forms. Presentation Skills, , Use of Technology aided Business Communication, Telephone Communication , E-mail Messages.

UNIT-V: REPORT WRITING

Significance of Report Writing, Structure of Reports. Types of Reports- Negative, Persuasive and Special Reporting, Informal Report- Proposals, Formal Reports-

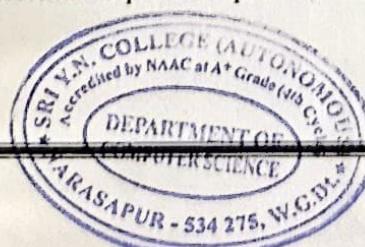
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K. Paedne

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Dr. S. L.

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Reference books

1. K Bhardwaj, Professional Communication, IK International Publishing House, New Delhi.
2. Krizan, Merrier, Logan and Williams, Effective Business Communications, Cengage, New Delhi.
4. Penrose, Business Communication for Managers, Cengage, New Delhi.
6. Urmila Rai & S.M. Rai, Business Communication, Himalaya Publishers,
7. Meenakshi Raman—Business Communication, Oxford University Press

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KC
S. Basnet
Parvya
Arun
MK



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DEPARTMENT OF COMPUTER SCIENCE

B.C.A III Year SEMESTER-V

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

MINOR COURSE-6: MANAGERIAL COMMUNICATION

Time: 3 Hours

Max.Marks: 60

PART-I

Answer any **FIVE** questions from the following.

5X4=20M

1. Objectives of Communication
2. Effective Listening
3. Role of Emotions in Communication
4. Oral presentation
5. E-mail messages
6. Types of Reports
7. Role of Communication in Business
8. Gate ways to effective communication

PART-II

Answer any **FIVE** of the following by selecting at least **TWO** from each Section

5X8=40M

SECTION-A

9. Define Communication and explain the role of business communication in detail.
10. Differentiate formal and informal communication
11. Describe the Johari Window model of interpersonal communication
12. Describe the use of Technology in business communication
13. Explain the essentials of effective Business Correspondence

SECTION-B

14. Discuss barriers of communication
15. Describe interpersonal communication and interpersonal perception.
16. Explain the process of communication in detail.
17. What is Transactional Analysis. Explain in detail.
18. What is Report writing? Explain different types of Reports.

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Cleel
B. D. N. P.*

*S. J. Jadhav
M. Venkatesh*




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MINOR PAPERS



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DEPARTMENT OF COMPUTER SCIENCE

B.B.A II Year SEMESTER-III

(w.e.f. 2025-26 Admitted Batch)

MINOR COURSE-2: DATA BASE MANAGEMENT SYSTEM

Theory

Credits: 3

3 hrs/week

Course Objectives:

- Graduates will have the expertise in analyzing real time problems and providing 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.

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*Y.C. Ceev
Boruya*



P.W.F.J.

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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

- Database Management Systems, 3rd Edition, Raghurama Krishnan, Johannes Gehrke, TMH
- Database System Concepts, 5th Edition, Silberschatz, Korth, TMH

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B. S. M. G.
K. Padma
M. R.*



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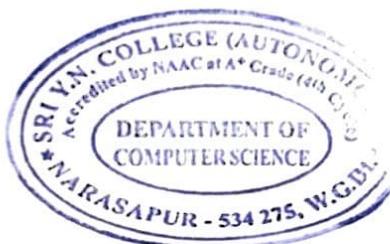
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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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B.B.A II Year SEMESTER-III

(w.e.f. 2025-26 Admitted Batch)

MINOR COURSE-2: DATA BASE MANAGEMENT SYSTEM

Time: 3 Hours

Max.Marks: 60

Part-I

Answer any FIVE of the following by selecting at least TWO from each Section

Section – A

(5X8=40Marks)

1. Explain the characteristics of Database Systems.
2. Explain the concept of Keys in DBMS.
3. Explain ER Diagram.
4. Explain different types of joins.
5. Explain ACID properties.

Section – B

6. Explain various Data Models.
7. Explain 1NF, 2NF and 3NF with examples.
8. Explain DDL operations with example.
9. Explain the concept of Views.
10. Explain about Serializability.

Part-II

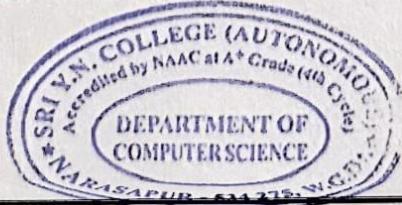
(5X4=20Marks)

Answer any FIVE questions from the following.

11. Write about Database Applications.
12. Write about BCNF.
13. Write about any 5 Basic SQL queries.
14. Write about DCL commands
15. Write about Functions in PL/SQL.
16. Write about Data Independence.
17. Write a short note on Relational Algebra with examples.
18. Write about Entities and Attributes.

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B.B.A II Year SEMESTER-III

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

MINOR COURSE-2: 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

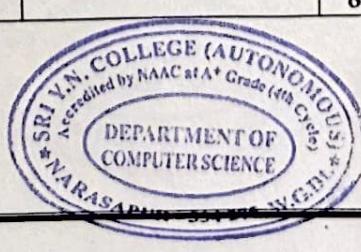
Column Name	Data Type	Size	Attribute
PRODUCT_NO	Varchar2	6	Primary key
DESCRIPTION	Varchar2	15	Not null
PROFIT_PERCENT	Number	4,2	Not null
UNIT_MEASUE	Varchar2	10	
QTY_ON_HAND	Number	8	
REORDER_LVL	Number	8	
SELL_PRICE	Number	8,2	Not null, cannot be 0
COST_PRICE	Number	8,2	Not null, cannot be 0

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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	Varchar2	20	
SAL_AMT	Number	8,2	Not null, cannot be 0
TGT_TO_GET	Number	6,2	Not null, cannot be 0
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")

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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 to Rs.3000.
5. List the names of all clients having 'a' as the second letter in their names.
6. List all clients whose BalDue is greater than value 1000.
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 1000 and less than or equal to 3000.
10. Find the products whose selling price is greater than 1000 and also find the new selling price as original selling price 0.50.

Cycle-II Supplier

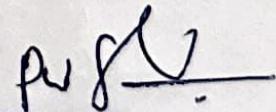
Aim: A manufacturing company deals with various parts and various suppliers supply these parts. It consists of three tables to store record its entire information. Those are as follows.

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)

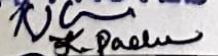
SPJX(Supplier_no, part_no, project_no, city)

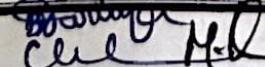
1. Get supplier numbers and status for suppliers in Chennai with status > 20.
2. Get project names for projects supplied by supplier 'S'.
3. Get colors of parts supplied by supplier S.
4. Get part numbers for parts supplied to any project in Mumbai.
5. Find the id's of suppliers who supply a red or pink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


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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. List the name, salary and PF amount of all the employees (PF is calculated as 10% of salary)
4. List the names of employees who are more than 2 years old in the organization.
5. Determine the number of employees, who are taking commission.
6. Update the employee salary by 20%, whose experience is greater than 12 years.
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 decided to raise the employee salary by 15% 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/SQL program to display top 10 rows in Emp table based on their job and salary.
4. Write a PL/SQL program to raise the employee salary by 10% for department number 30 people and also maintain the raised details in the raise table.
5. Create a procedure to update the salaries of employees by 20%, 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

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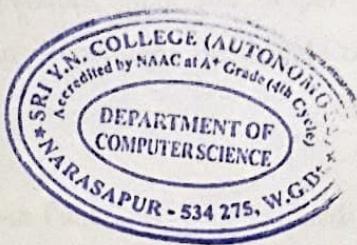
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Name	Null?	Type
MNNO	NOTNULL	NUMBER(3)
CNAME		VARCHAR2(20)
CUR_READ		NUMBER(5)
PREV_READ		NUMBER(5)
NO_UNITS		NUMBER(5)
AMOUNT		NUMBER(8,2)
SER_TAX		NUMBER(8,2)
NET_AMT		NUMBER(9,2)

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

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M. R.



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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.

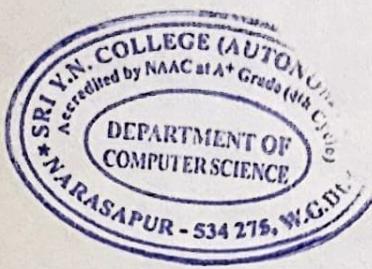
GUI Programming and Database Connectivity Using Python. Graphical User Interfaces. Using the Tkinter Module, Creating Label, Text, Buttons, info Dialog Boxes, Radio button, Check button, Getting Input, Importing MySQL for Python , Connecting with a database, Forming a query in MySQL, Passing a query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

References:

1. Mark Lutz, Learning Python, 5th Ed. 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 Reema Thareja.
5. Albert Lukaszewski, MySQL for Python, Packt 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** of the following by selecting at least **TWO** from each Section

5X8=40M

SECTION-A

1. Explain various Data Types in Python.
2. Explain the concept of Inheritance in Python.
3. Discuss various List Operations.
4. Explain Operations on Arrays.
5. What is an Exception Handling in Python?

SECTION-B

6. Explain various Operators in Python.
7. Discuss various Dictionary Operations.
8. Explain about Pandas and Numpy with examples.
9. Explain various Python Libraries.
10. Explain how to create a label, text box and button with examples.

PART-II

Answer any **FIVE** questions from the following.

5X4=20M

11. Write about Keywords in Python
12. Write about Packages.
13. Write a short note on Tuples in Python.
14. Write about Data Frame.
15. Write about Graphical User Interfaces.
16. Write about Type Conversion.
17. Explain User Defined Functions in Python with an example.
18. Write about Built-in Functions in Dictionary.

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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

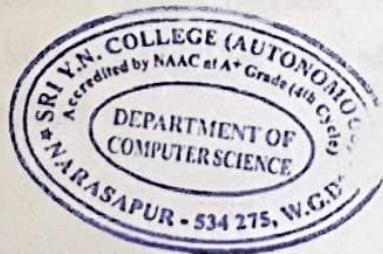
2 hrs/week

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 a program to enter names of employees and their salaries as input and store them in a 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 matplotlib.
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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L. Faheem
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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 Gagne 8th Edition, 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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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)

Time: 3 Hour

Max Marks: 60

PART-I

Answer any **FIVE** of the following by selecting at least **TWO** from each Section

5X8=40M

SECTION-A

1. What is Operating system? Write types of Operating systems.
2. What is process control block. Explain
3. What is semaphore. Explain Critical section problem in detail.
4. What is swapping. Discuss
5. Illustrate file allocation methods.

SECTION-B

6. What is system program. Discuss types of system calls
7. Differentiate preemptive and non preemptive scheduling algorithm.
8. What is deadlock. Discuss Deadlock prevention.
9. Discuss demand paging and segmentation.
10. Explain about Directory Structure.

PART-II

Answer any **FIVE** questions from the following.

5X4=20M

11. Multiprogramming.
12. Virtual machine.
13. Dispatch latency.
14. Critical region.
15. Compaction.
16. Basic Features of Unix Operating System.
17. Scheduling Criteria
18. Synchronization

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N. C. N. George



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L. Paresh M.D.

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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. Write a program using the following system calls of UNIX OS fork, 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. Brian W. Kernighan and Rob Pike, "The UNIX Programming Environment" Prentice Hall India (Edition available in LRC and in the form of EBook on student resource).
2. Yashwant Kanetkar, "UNIX Shell Programming" BPB Publications (First Edition).

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DEPARTMENT OF COMPUTER SCIENCE



B.B.A III Year SEMESTER-V

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

MINOR COURSE-5: WEB PROGRAMMING

Theory

Credits: 3

3 hrs/week

Course Objectives:

1. Learn the basics of creating a website.
2. Understand HTML5 coding conventions
3. Understand the philosophy of how HTML and CSS should fit together
4. Learn how Java Script came to be.

Course Outcomes: Upon Completion of the course, the students will be able to

1. Understand the Web Design Process.
2. Apply the HTML tags, elements and attributes
3. Apply different types of HTML elements
4. Use of organization all elements, tables and images
5. Use of audio, video files
6. Apply java Script concepts

Unit-I:

Introduction to Web Programming: Introduction, creating a website, HTML tags, HTML Elements, HTML attributes, CSS Preview, History of HTML, Differences between old HTML and HTML5, how to check your HTML code

Unit-II:

Coding Standards, Block Elements:

HTML coding conventions, Comments, HTML Elements, Should Describe Web Page Content Accurately, Block Elements, block quote Element, Whitespace Collapsing, pre Element, Phrasing Elements, Editing Elements, q and cite Elements, dfn, abbr, and time Elements, Code-Related Elements, br and wbr Elements.

Text Elements, and Character References: sup, sub, s, mark, and small Elements, strong, em, b, u, and i Elements, span Element, Character References, Web Page with Character References, and Phrasing Elements.

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Unit-III:

Cascading Style Sheet(CSS) : CSS Overview, CSS Rules, Example with Type Selectors and the Universal Selector, CSS Syntax and Style, Class Selectors, ID Selectors, span and div Elements, Cascading, style Attribute, style Container, External CSS Files, CSS Properties, Color Properties, RGB Values for Color, Opacity Values for Color, HSL and HSLA Values for Color, Font Properties, line-height Property, Text Properties, Border Properties, Element Box, padding Property, margin Property.

Unit-IV:

Organizing a Page's, Content with Lists, Figures, and Various, Organizational Elements: List, Descendant selector, Figure with picture and caption, Organizational elements, Navigation bar, Header and Footer, User agent style sheet.

Tables and CSS Layout: Data tables vs Layout tables, Table elements, Form at table

Links and Images: Implement a link with the a element, different types of href attribute Values, relative URLs, Implement a link that jumps to a particular location within a web page, element's target attribute, Understand the concepts behind GIF, JPEG, and PNG bitmap image formats.

Unit-V:

Image Manipulations, Audio and Video: Position an image, how to display a shortcut icon in a browser's tab area, iframe, Create an image sprite file, Implement an audio player using the audio element, Handle different audio file formats, Cover a web page's background with an image, web fonts, Implement a video player using the video element.

Introduction to JavaScript: Button control with an event Handler, Syntax rules for functions, variables, identifiers, and assignments, Document Object Model(DOM).

Prescribed Text Books:

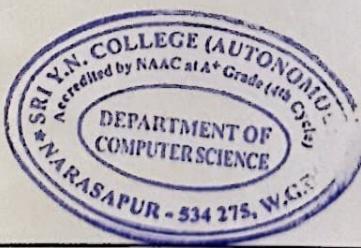
1. **Web Programming with HTML5, CSS and Java Script, John Dean,Jones&Bartlett Learning**

Reference Text Books:

1. **HTM L & CSS: The Complete Reference, 5th Edition, Thomas.A. Powell**

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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.B.A III Year SEMESTER-V

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

MINOR COURSE-5: WEB 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. What is HTML? Explain about structure of HTML with example.
2. What are HTML tags and attributes? Explain with examples.
3. What are phrasing elements in HTML? Write any five phrasing elements and explain them.
4. What are editing elements in HTML? Explain ``, `<ins>`, and `<mark>` tags with examples.
5. Explain the use of `<sup>`, `<sub>`, `<s>`, `<small>`, and `<mark>` tags with examples.

Section-II

6. What is CSS? Explain the three types of CSS with suitable examples.
7. Explain the use of font-related CSS properties. Include examples using font-family, font-size, and line-height.
8. Write HTML code to create a data table with headings, rows, and columns. Explain the use of `<table>`, `<tr>`, `<th>`, and `<td>`.
9. Explain how to create hyperlinks using the `<a>` element. What are different types of href values?
10. What are the basic rules for writing variables, functions, and assignments in JavaScript? Give simple examples.

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Section-III

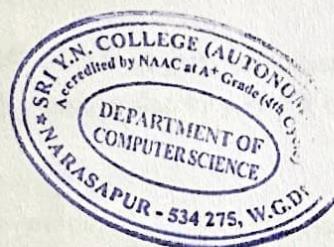
(5X4=20Marks)

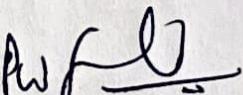
Answer any five questions from the following.

11. What is Web Programming?
12. What is CSS?
13. What is block element? Give an example.
14. What is the difference between
 and <wbr>?
15. Name any two font properties in CSS.
16. What is the purpose of the padding and margin properties?
17. What is an image sprite?
18. Write HTML code to create one row with two columns in a table.
19. Write a simple JavaScript syntax to define a function.

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DEPARTMENT OF COMPUTER SCIENCE

B.B.A III Year SEMESTER-V

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

MINOR COURSE-5: WEB PROGRAMMING

Practical

Credits: 1

2hrs/week

Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Create web pages using HTML.
2. Apply different styles to HTML page.
3. Work with different scripting elements.

WEEK-1

1. Write an HTML code to display your education details in a tabular format.
2. Write an HTML code to display your CV on a web page.

WEEK-2

1. Create a webpage with HTML describing your department. Use paragraph and list tags.
2. Apply various colors to suitably distinguish keywords. Also apply font styling like italics, underline and two other fonts to words you find appropriate. Also use header tags.
3. Create links on the words e.g. "Wi-Fi" and "LAN" to link them to Wikipedia pages.
4. Insert an image and create a link such that clicking on image takes user to other page.
5. Change the background color of the page. At the bottom create a link to take user to the top of the page.

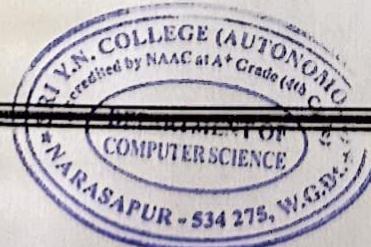
WEEK-3

1. Create a table to show your class time-table.
2. Use tables to provide layout to your HTML page describing your university infrastructure.
3. Use and tags to provide a layout to the above page instead of a table layout.
4. Use frames such that page is divided into 3 frames 20% on left to show contents of pages, 60% in center to show body of page, remaining on right to show remarks.
5. Embed Audio and Video in to your HTML webpage.

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WEEK-4

1. Write an HTML code to illustrate the usage of the following:
 - Ordered List
 - Unordered List
 - Definition List

WEEK-5

1. Write an HTML code to create a frameset having header, footer, and navigation and content sections.

WEEK-6

1. Write an HTML code to demonstrate the usage of inline CSS.
2. Write an HTML code to demonstrate the usage of internal CSS.
3. Write an HTML code to demonstrate the usage of external CSS.

WEEK-7

1. Create a form similar to the one in previous experiment. Put validation check on values entered by the user using JavaScript (such as age should be a value between 1 and 150).
2. Write a Java Script program to display information box as soon as page loads.
3. Write a Java Script program to change background color after 5 seconds of page load.
4. Write a Java Script program to dynamically bold, italic and underline words and phrases based on user actions.
5. Write a Java Script program to display a hidden div (e.g. showing stats of a player when user clicks on his name)
6. Write a Java script to prompt for user's name and display it on the screen.
7. Design HTML form for keeping student record and validate it using Java script.
8. Write programs using Java script for Web Page to display browser's information.

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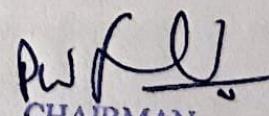
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L. Paethne

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

MINOR COURSE-6: WEB DEVELOPMENT USING PHP&MYSQL

Theory

Credits: 3

3 hrs/week

Course Outcomes: Upon Completion of the course, the students will be able to

1. Write simple programs in PHP.
2. Understand how to use regular expressions, handle exceptions, and validate data.
3. Apply In-Built functions and Create User defined functions in PHP programming.
4. Write PHP scripts to handle HTML forms.
5. Write programs to create dynamic and interactive web-based applications using PHP and MYSQL.
6. Know how to use PHP with MySQL DB and can write database driven web pages.

Unit-I:

Using PHP: PHP Basics: Accessing PHP, Creating Sample Application, Embedding PHP in HTML, Adding Dynamic Content, Identifiers, Variables, Constants, Operators, Data types, Accessing Form Variables, Variable handling Functions, Making Decisions with Conditions.

Storing and Retrieving Data: Processing Files, opening a File, writing to a File, closing a File, Reading from a File, Other File Functions, Locking Files.

Unit-II:

Arrays: Arrays basics, Types, Operators, Array Manipulations.

String Manipulation and Regular Expressions: Strings Basics, Formatting Strings, Joining and Splitting Strings with String Functions, Comparing Strings, Matching and Replacing Substrings with String Function, Introducing Regular Expressions, Find, Replace, Splitting in regular Expressions.

Unit-III:

Reusing Code and Writing Functions: The Advantages of Reusing, Using require () and include (), Using Functions in PHP, Scope, and Passing by Reference Versus Passing by Value, keyword, Recursion.

Object-Oriented PHP: OOP Concepts, Creating Classes, Attributes, and Operations in PHP, Implementing Inheritance in PHP, Understanding Advanced Object-Oriented Functionality in PHP.

Unit-IV:

Using MySQL: Relational Database Concepts, Web Database Architecture, Introducing MySQL's Privilege System, Creating Database Tables, Understanding MySQL, Identifiers, Database Operations, querying a Database, Understanding the privilege System, Making Your MySQL Database Secure, Optimization, Backup, Restore.

Unit-V:

Introduction of Laravel PHP Framework: Why Laravel, setting up Laravel Development Environment, Routing and Controllers: introduction to MVC, the HTTP verbs, and REST, Route Definitions, Route Groups, Signed Routes, Views, Controllers.

Prescribed Text Books:

1. Luke Welling ,Laura Thomson, " PHP and MySQL Web Development", 5th Edition
2. Matt Stauffer, "Laravel:Up&Running", 2nd Edition
3. Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, (2007).
4. Steven Holzner ,PHP: The Complete Reference, McGraw-Hill
5. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS&HTML5, Third Edition O'reilly, 2014
6. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).

7. Web resources:

<http://www.codecademy.com/tracks/ph> <http://www.w3schools.com/PHP>

<http://www.tutorialpoint.com>

8. Other web sources suggested by the teacher concerned and the college librarian including reading material.

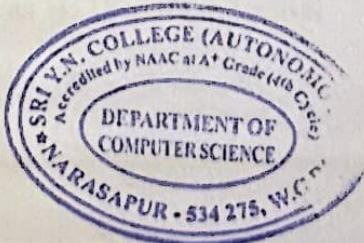
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Unit No.	Essay Questions	Short Answer Questions
I	2(Section-I)	2(Section-III)
II	3(Section-I)	1(Section-III)
III	2(Section-II)	2(Section-III)
IV	2(Section-II)	1(Section-III)
V	1(Section-II)	2(Section-III)

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DEPARTMENT OF COMPUTER SCIENCE

B.B.A III Year SEMESTER-V

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

MINOR COURSE-6: WEB DEVELOPMENT USING PHP&MYSQL

Theory

Credits: 3

3 hrs/week

Answer any FIVE questions choosing at least TWO questions from Sections I&II (5X8=40Marks)

Section-I

1. Explain PHP data types, usage of variables and constants.
2. Describe the process of file handling in PHP.
3. Explain types of arrays and array manipulation techniques in PHP.
4. Explain string manipulation in PHP with string functions.
5. Explain the use of regular expressions in PHP.

Section-II

6. Discuss the concept of Scope in PHP with examples.
7. What is inheritance? How it is implemented in PHP?
8. Describe relational database concepts.
9. Explain steps for creating, querying, and optimizing MySQL database.
10. Write about MVC.

Section-III

Answer any five questions from the following.

(5X4=20Marks)

11. Write about identifiers in PHP
12. Write about operators in PHP.
13. Write about string basics in PHP.
14. State the advantages of reusing code in PHP.
15. Write about creating classes in PHP
16. Write a short note on MySQL privilege system.
17. Write about the Laravel development environment.
18. Write about HTTP verbs in Laravel.

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15/2/2024

B. Narayana
K. Pachla
RJD



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DEPARTMENT OF COMPUTER SCIENCE

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

MINOR COURSE-6: WEB DEVELOPMENT USING PHP&MYSQL

Practical	Credits: 1	2hrs/week
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Course Outcomes: On successful completion of this practical course, student shall be able to:

- Write, debug, and implement the Programs by applying concepts and error handling techniques of PHP.
- Create an interactive and dynamic website.
- Create a website with reports generated from a database.
- Create an interactive web site for e-commerce sites like online shopping, etc.

WEEK-1

1. Write a PHP program to Display "Hello", and today's date.
2. Write a PHP program to display Fibonacci series.
3. Write a PHP Program to read the employee details.

WEEK-2

4. Write a PHP program to prepare the student marks list.
5. Write a PHP program to generate the multiplication of two matrices.
6. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.

WEEK-3

7. Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
8. Write PHP script to demonstrate passing variables with cookies.

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B.B.Singh
S.K.Patnaik



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9. Write a program to keep track of how many times a visitor has loaded the page.

Write a PHP application to add new Rows in a Table

WEEK-4

10. Write a PHP application to add new Rows in a Table.

11. Write a PHP application to modify the Rows in a Table.

12. Write a PHP application to delete the Rows from a Table

13. Write a PHP application to fetch the Rows in a Table.

WEEK-5

14. Develop an PHP application to implement the following Operations. Registration of Users. Insert the details of the Users. Modify the Details. Transaction Maintenance. No of times Logged in Time spent on each login. Restrict the user for three trials only. Delete the user if he spent more than 100 Hrs of transaction.

WEEK-6

15. Write a PHP script to connect MySQL server from your website.

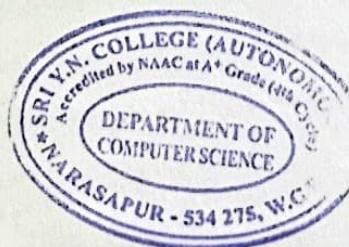
WEEK-7

16. Write a program to read customer information like cust-no, cust-name, item purchased, and mob- no, from customer table and display all these information in table format on output screen.

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