A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

JAGANNAICKPUR, KAKINADA.

DEPARTMENT OF COMPUTER SCIENCE

BOARD OF STUDIES OF COMPUTER SCIENCE

2025-2026

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. I YEAR I SEMESTER
Course 1: COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION

Course Code: **No. of Hours/Week: 3**

Course Objective:

To provide students with fundamental knowledge of computer systems, networking, productivity software, and data analysis tools, enabling them to effectively utilize them.

Course Outcomes:

At the end of the course the student will be able to

CO1: Explain number systems, computer evolution, block diagram, and generations.
CO2: Describe computer organization, types, and networking fundamentals.
CO3: Create professional documents and presentations using word processors and presentation tools.
CO4: Apply spreadsheet functions and data handling techniques for problem solving.
CO5: Analyze and visualize data using advanced spreadsheet tools and dashboards.

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	1	2	1	3	2	2	2
CO2	3	2	2	1	2	2	3	2	3	3
CO3	3	-	-	1	-	1	3	3	3	3
CO4	3	1	1	1	1	1	3	3	3	3
CO5	2	-	-	-	-	1	3	3	3	3
Average	2.8	1	0.8	0.8	1	1.2	3	2.6	2.8	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

Unit I: 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 II: Basic organization 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 III**:** 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 IV: Spreadsheet Basics:

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

Functions and Formulae: 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

Unit V: Data Analysis and Visualization**:**

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

Charts and Dashboards: Creating Interactive Dashboards, Using slicers with Pivot Tables, Combo Charts and Sparklines

Productivity Tips: Using Named Ranges, Freeze Panes, Split View

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/

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. I YEAR I SEMESTER

Course 1: COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION

Course Code: **No. of Hours/Week: 3**

Blue Print

S.No.	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I** **Number Systems, Evolution, Block diagram and Generations**	**2**	**2**	**24**
2.	**Unit – II** **Basic Organization and N/W Fundamentals**	**2**	**2**	**24**
3.	**Unit – III** **Word Processing and Presentations**	**2**	**2**	**24**
4.	**Unit – IV** **Spreadsheet Basics**	**2**	**1**	**20**
5.	**Unit – V** **Data Analysis and Visualization**	**2**	**1**	**20**
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
MODEL QUESTION PAPER
B.Sc. I YEAR I SEMESTER
Course 1: COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION

Time : 3hrs **Course Code:** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. 5 X 4=20

1. What is Computer? Explain the characteristics of the Computer. (CO1)(L4)
2. Explain Binary number system with example. (CO1)(L2)
3. Explain the types of Computers? (CO2) (L1)
4. What is an IP address? Explain. (CO2)(L2)
5. Give a brief account on Google Docs. (CO3)(L2)
6. Distinguish between animation and transition controls in Power point. (CO3)(L4)
7. What is a Cell in spreadsheet? Explain cell referencing. (CO4)(L4)
8. Write a short note on Pivot table and Pivot chart. (CO5)(L2)

SECTION-B

II. Answer the following questions. 5 X 8=40

9. (a) Define Number System. Explain different types of Number systems with illustrations. (CO1)(L4)
   (Or)
   (b) Explain the Block diagram of Computer system with a neat diagram? (CO1)(L4)

10. (a) Explain about Computer Memory hierarchy. (CO2) (L2)
    (Or)
    (b) Discuss various network topologies with neat diagrams. (CO2)(L2)

11. (a) What is Mail merge in MS-Word? Explain with an example. (CO3)(L4)
    (Or)
    (b) Discuss the features of Google Slides/PowerPoint for creating effective presentations. (CO3) (L4)

12. (a) Explain different types of charts in MS-Excel. (CO4) (L4)
    (Or)
    (b) Discuss advanced lookup functions VLOOKUP, HLOOKUP, and XLOOKUP with suitable examples. (CO4) (L4)

13. (a) Discuss What-If analysis tools in Excel with examples. (CO5) (L4)
    (Or)
    (b) Explain how dashboards can be created using pivot tables, slicers, and charts. (CO5)(L4)

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. I YEAR I SEMESTER

Course 1: COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION

Course Code: **No. of Hours/Week: 2**

List of Experiments**:**

1. Demonstration of Assembling and Dessembling 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).

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. (Computer Science)– I Semester
Course - 2: PROBLEM SOLVING IN C

Course Code: **No. of Hours/Week: 3**
Paper : 2

Course Objective:
To equip students with the foundational skills in C programming, enabling them to design algorithms, implement control structures, and manage data using arrays, strings, and pointers effectively.

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

CO1: Understand basic computing concepts, programming paradigms and write structured C programs

CO2: Apply control flow statements to solve logical and repetitive tasks in C

CO3: Implement arrays and string operations to manage and manipulate data efficiently.

CO4: Design modular code using functions, recursion, and appropriate parameter passing

CO5: Utilize pointers and memory operations for effective data handling. Demonstrate competence in dynamic memory allocation and text file processing.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PO1 0
CO1	3	2	1	-	-	1	3	2	2	2
CO2	3	2	2	-	-	2	3	2	3	3
CO3	3	-	-	-	-	1	3	3	3	3
CO4	3	1	1	-	-	1	3	3	3	3
CO5	2	-	-	-	-	1	3	3	3	3
Average	2.8	1	0.8	-	-	1.2	3	2.6	2.8	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

Unit-I: 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

Unit-II: 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 –III: 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 –IV: 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-V: 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

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. (Computer Science)– I Semester
Course - 2: PROBLEM SOLVING IN C

Course Code: **No.Hours/Week:3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I Introduction to computer and programming**	1	1	20
2.	**Unit – I Fundamentals of C**	1	1	12
3.	**Unit – II Control Statements**	2	1	12
4.	**Unit – III Arrays**	1	1	12
5.	**Unit – III Strings**	1	0	08
6.	**Unit – IV Functions**	1	1	12
7.	**Unit – IV Pointers**	1	1	12
8.	**Unit – V Dynamic Memory Management & Structures**	1	1	12
9.	**Unit – V Unions & Files**	1	1	12
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. (Computer Science)– I Semester
MODEL QUESTION PAPER
Course - 2: PROBLEM SOLVING IN C

Time : 3hrs **Course Code:** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. What is an algorithm? Give the characteristics of an algorithm. **(CO1) (L2)**
2. Categorize different data types available in C. **(CO1) (L4)**
3. Illustrate switch statement with an example. **(CO2) (L2)**
4. Explain about One-Dimensional arrays with an example. **(CO3) (L2)**
5. Write about Pointer Arithmetic. **(CO4) (L3)**
6. Inspect the significance of recursive functions. **(CO4) (L4)**
7. Explain the difference between Structure and Union. **(CO5) (L4)**
8. Write a short note on nested structures. **(CO5) (L2)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Discuss different types of Programming languages. **(CO1) (L4)**

(or)

(b) Elucidate different types of operators in C. **(CO1) (L4)**

10. (a) Compare and contrast different Decision-making statements. **(CO2) (L5)**

(or)

(b) Distinguish between different Looping statements in C. **(CO2) (L4)**

11. (a) List the types of arrays. Explain initialization, accessing the elements of a one- dimensional array with an example. **(CO3) (L5)**

(or)

(b) Explain various string handling & character functions. **(CO3) (L4)**

12. (a) Explain about Call by Value and Call by reference with illustration.**(CO4) (L3)**

(or)

(b) Explain various categories of Functions with examples. **(CO4) (L4)**

13. (a) What is a structure? Illustrate accessing the members of a structure with an example.**(CO5)(L2)**

(or)

(b) Explain about Dynamic Memory Allocation in detail. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. (Computer Science)– I Semester
Course - 2: PROBLEM SOLVING IN C

Course Code: **No. of Hours/Week: 2**

Lab 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

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

SKILL ENHANCEMENT COURSE

B.A./B.Com./B.Sc. I YEAR – I SEMESTER

AI FUNDAMENTALS

Course Code: **No. of Hours/Week: 3**

Course Objective:

To understand the history, subfields, and applications of Artificial Intelligence, and learn the role of prompt engineering in education and content creation.

Course Outcomes:

Upon successful completion of the course, a student 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.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	3	2	2	3
CO2	3	3	3	2	1	1	3	3	2	3
CO3	3	2	3	2	-	2	3	3	2	3
CO4	3	3	3	1	1	1	3	3	3	3
CO5	2	2	2	1	1	2	3	2	3	3
Average	2.8	2.4	2.6	1.4	0.6	1.4	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

Unit-I: AI and its Subfields

Introduction to Artificial Intelligence, History, Definition, Artificial General Intelligence, Industry Applications of AI, Challenges in AI.

Knowledge Engineering, Machine Learning, Computer Vision, Natural Language Processing, Robotics.

Unit-II: Applications of AI

Healthcare, Finance, Retail, Agriculture, Education, Transportation.

Unit-III: Bias and Fairness in AI Systems

Ethics in AI, Bias and Fairness in AI Systems, Transparency in AI Systems, Accountability, Security, Privacy, Inclusivity, Sustainability, Robustness, Reliability.

Unit-IV: AI in Research, Generative AI and prompt engineering

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

Unit-V: Applications of Prompt engineering

Applications of Prompt Engineering: Education, Business & Commerce, Content Creation: AI for Creative Writing,AI for creative design, writing AI scripts for video, generating slides and slidesGPT usage, Designing thumbnails and channel branding with AI

Text Books:

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.

References:

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

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.A./B.Com./B.Sc. I YEAR – I SEMESTER

AI FUNDAMENTALS

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	Unit – I	2	2	24
2	Unit – II	2	2	24
3	Unit – III	2	2	24
4	Unit – IV	2	1	20
5	Unit – V	2	1	20
			Total Marks	112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

MODEL QUESTION PAPER
B.A./B.Com./B.Sc. I YEAR – I SEMESTER

AI FUNDAMENTALS

Time : 3hrs **Course Code:** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4 = 20**

1. Define Artificial Intelligence in simple terms**. (CO1) (L2)**
2. Differentiate between Artificial General Intelligence (AGI) and Machine Learning. **(CO1) (L3)**
3. Mention two uses of AI in the agriculture sector. **(CO2) (L1)**
4. How is AI applied in the finance industry? **(CO2) (L2)**
5. Define transparency in AI with a simple example. **(CO3) (L2)**
6. List two challenges of ensuring privacy in AI applications.**(CO3) (L2)**
7. What is Generative AI? Give one example? **(CO4) (L3)**
8. How is AI used for generating slides and presentations? **(CO5) (L3)**

SECTION-B

II. Answer the following questions. **5 X 8 = 40**

9. (a) Trace the history and evolution of Artificial Intelligence with key milestones. **(CO1) (L2)**

(or)

(b) Discuss industry applications of AI and highlight challenges in adopting AI systems. **(CO1) (L4)**

10. (a) Explain the role of AI in healthcare with real-world applications. **(CO2) (L4)**

(or)

(b) Discuss how AI is transforming the education sector with suitable examples. **(CO2) (L3)**

11. (a) Explain bias and fairness in AI systems with real-world examples. **(CO3) (L4)**

(or)

(b) Discuss ethical issues in AI, focusing on inclusivity, sustainability, and accountability. **(CO3)(L4)**

12. (a) Explain the working and applications of any two tools like ChatGPT, Perplexity **(CO4) (L4)**

(or)

(b) Discuss the integration of AI in scientific research and experimentation **(CO4) (L4)**

13. (a) Discuss the applications of prompt engineering in education, business, and commerce. **(CO5) (L2)**

(or)

(b) Evaluate the role of prompt engineering in modern content creation with examples. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

B.A./B.Com./B.Sc. I YEAR – I SEMESTER

AI FUNDAMENTALS

Course Code: **No. Hours/Week:**

Lab Experiments

1. Create a mind map of AI subfields: NLP, CV, ML, Robotics, Knowledge Engineering using Canva/Napkin AI/ Similar Open AI tool
2. Text Analysis with Open-Source NLP Tools: **Tool:** Voyant Tools (text analysis web app)
   - Input sample texts (e.g., news articles, speeches).
   - Explore word frequency, keywords, sentiment.
   - Understand how NLP extracts meaning from text.
3. Train a basic image classifier using webcam images. Observe how the model "learns." Using Google Teachable Machine
   - Train two image categories (e.g., "Smiling" vs. "Not Smiling") using their own webcam images.
   - Observe how the model learns to classify.
   - Now try feeding images of people with different skin tones, facial features, etc.
   - Observe misclassifications or differences in confidence.
4. Simulate an AI chatbot helping a farmer or a student. You may use any GenAI tool of your choice. You may use the prompt below and also try your own.
   Prompt:
   "Act as an agriculture assistant. A farmer wants to know the best crop based on soil and season. Ask questions and suggest crops."
5. Test Generative AI- Generate a poem or image from prompt "A futuristic green city." using ChatGPT, Hugging Face (e.g., image or text generation)
6. Observe how generative AI models may show biased results when prompted with neutral profession descriptions. (Bing Image Creator / DALL·E on ChatGPT/ChatGPT). Generate images using the following neutral prompts:
   - "A doctor treating a patient"
   - "A teacher in a classroom"
   - "A CEO giving a speech"
   - "A software engineer working from home" Observe and discuss:
   - What gender/race/age are most commonly shown?
   - Are the results stereotypical or diverse?
7. Check how language models may express bias depending on names, ethnicity, or location. Use ChatGPT or Gemini
   Prompts:
   Prompt A:"A person named Raj is applying for a bank loan. Will he be approved?"

   Prompt B:
   "A person named John is applying for a bank loan. Will he be approved?"
   Change names, genders, and nationalities.
   Observe the following and report your findings:
   - Are the responses different?
   - Is one version more positive or negative?
   - Does the model express bias or hesitate?
   - Should AI make such predictions?

- How do developers prevent this?

8. Exploring Text Generation and Summarization with Google AI Studio

Generate Creative Content

"Write a short story (150 words) about a robot who wants to become a chef."

- Submit and read the AI-generated story.
- Discuss how detailed and creative the output is.

Summarize a Paragraph

Prompt:

Summarize the following paragraph in 3 sentences:

"Artificial Intelligence is a branch of computer science that aims to create intelligent machines that can mimic human thinking. It includes various subfields like machine learning, natural language processing, and robotics. AI is widely used in industries such as healthcare, finance, and transportation to improve efficiency and decision-making."

- Submit and review the summary.
- Evaluate how well AI extracts key points.

Refine Your Prompt

Try changing the summary prompt to:

"Summarize the paragraph above in simple language for 10-year-olds."

- Compare this output to the previous one.
- Note how prompt wording changes results.

9. AI for Creative Writing

Prompt:

"Write a short motivational story for 10-year-old students in under 150 words."

10. Generate **Slides:** Tool: SlidesGPT/Other Free AI tool

Prompt**:**

"Create a 5-slide presentation on 'AI in Smart Farming'."

11. YouTube Thumbnails / Branding: Tool: Canva + Magic Media AI

Design a thumbnail using Canva's AI tools with a prompt like:

"Design a YouTube thumbnail for a video titled 'Top 5 AI Tools for Students'."

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. – II Semester

Course 3: DATA STRUCTURES USING C

Course Code: **No. of Hours/Week: 3**

Paper : 3

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance ofvarious data structures in developing and implementing efficient algorithms.

Course Outcomes

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

CO1: Explain algorithm characteristics, time and space complexity, and asymptotic notations with clarity.

CO2: Implement and analyze different types of linked lists, including insertion, deletion, and traversal operations

CO3: Develop stack and queue data structures using arrays and linked lists, and apply them in expression evaluation.

CO4: Apply efficient searching and sorting algorithms to solve computational problems and evaluate performance trade-offs

CO5: Construct and traverse tree and graph structures, using them to solve problems like shortest path and spanning trees

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	1	2	1	3	2	2	2
CO2	3	2	2	1	2	2	3	2	3	3
CO3	3	-	-	1	-	1	3	3	3	3
CO4	3	1	1	1	1	1	3	3	3	3
CO5	2	-	-	-	-	1	3	3	3	3
Average	2.8	1	0.8	0.8	1	1.2	3	2.6	2.8	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I: 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-II. 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).

UNIT-III: 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-IV: 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-V: 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

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – I Year II Semester

DATA STRUCTURES USING C

Course Code: **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	Unit – I Basic Concepts	2	2	24
2	Unit – II Linked Lists	2	2	24
3	Unit – III Stacks Queues	2	1	20
4	Unit – IV Searching Sorting	2	1	20
5	Unit – V Trees & Graphs	2	2	24
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
MODEL QUESTION PAPER
B.Sc. I YEAR - II SEMESTER
DATA STRUCTURES USING C

Time : 3hrs **Course Code:** **Max Marks : 60**

SECTION – A

I. Answer any FIVE of the following questions. **5x4=20**

1. Discuss briefly about Primitive Data types. **(CO1) (L2)**
2. Discuss briefly about Asymptotic Notation. **(CO1) (L4)**
3. What is an ADT? Discuss about Array ADT. **(CO2) (L2)**
4. What is a Linked List? Give the node structure of node in a Single linked list. **(CO2) (L4)**
5. What are the applications of Stacks? Explain. **(CO3) (L2)**
6. Discuss briefly about Push and Pop operations on Stacks. **(CO3) (L2)**
7. Write short notes on Linear Search. **(CO4) (L4)**
8. Explain about In-order traversal in a Binary Search tree. **(CO5) (L1)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Define Data Structures. Elucidate different types of Data Structures. (**CO1) (L4)**

(Or)

(b) Elucidate Algorithm Analysis and Give a brief account on Algorithm Complexity. **(CO1) (L4)**

10. (a) Write a program to illustrate insertion and deletions in a single linked list. **(CO2) (L6)**

(Or)

(b) What is a Linked List? Distinguish between different types of Linked lists. **(CO2) (L4)**

11. (a) Define Stack. Discuss Array and linked list representation of Stack. **(CO3) (L4)**

(Or)

(b) Illustrate the Operations on Queue with an example. **(CO3) (L3)**

12. (a) Discuss Bubble Sort with an example. **(CO4) (L4)**

(Or)

(b) Explain about Binary search with an example. **(CO4) (L4)**

13. (a) Explain about various Graph Traversals. **(CO5) (L4)**

(Or)

(b) What is a Binary Tree? Discuss about Array and Linked List representation of Binary Trees. **(CO5) (L2)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. I YEAR - II SEMESTER

COURSE 3: DATA STRUCTURES USING C

Course Code : **Credits: 1** **No. hrs/week : 2**

Lab 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

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. Computer Science– II Semester

Course - 4: DIGITAL LOGIC DESIGN

Course Code: **No. of Hours/Week: 3**
Paper : 4

Course Objectives
To familiarize with the concepts of designing digital circuits.

Course Outcomes
Upon successful completion of the course, the students will be able to
CO1: Understand how to Convert numbers from one radix to another radix and perform arithmetic operations.
CO2: Simplify Boolean functions using Boolean algebra and k- maps
CO3: Design adders and subtractors circuits.
CO4: Design combinational logic circuits such as decoders, encoders, multiplexers and demultiplexers.
CO5: Use flip flops to design registers and counters.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	-	1	1	-	-	3	2	1	2
CO2	3	1	2	2	1	-	3	3	3	2
CO3	3	-	2	2	-	1	3	3	2	2
CO4	3	1	1	1	1	1	3	2	1	3
CO5	3	1	1	1	1	1	3	2	2	2
Average	3	0.6	1.4	1.4	0.6	0.6	3	2.4	1.8	2.2

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT – I
Number Systems: Binary, octal, decimal, hexadecimal number systems, conversion of numbers from one radix to another radix, r's, (r-1)'s complements, signed binary numbers, addition and subtraction of unsigned and signed numbers, weighted and unweighted codes.

UNIT – II
Logic Gates and Boolean Algebra: NOT, AND, OR, universal gates, X-OR and X-NOR gates, Boolean laws and theorems, complement and dual of a logic function, canonical and standard forms, two level realization of logic functions using universal gates, minimizations of logic functions (POS and SOP) using Boolean theorems, K-map (up to four variables), don't care conditions.

UNIT – III
Combinational Logic Circuits – 1: Design of half adder, full adder, half subtractor, full subtractor, ripple adders and subtractors, ripple adder / subtractor

UNIT – IV
Combinational Logic Circuits – 2: Design of decoders, encoders, priority encoder, multiplexers, demultiplexers, higher order decoders, demultiplexers and multiplexers, realization of Boolean functions using decoders, multiplexers.

UNIT – V

Sequential Logic Circuits: Classification of sequential circuits, latch and flip-flop, RS- latch using NAND and NOR Gates, truth tables, RS, JK, T and D flip-flops, truth and excitation tables, conversion of flip-flops, flip-flops with asynchronous inputs (preset and clear). Design of registers, shift registers, bidirectional shift registers, universal shift register, design of ripple counters, synchronous counters and variable modulus counters.

Text Books:

1. M. Morris Mano, Michael D Ciletti, "Digital Design", 5th edition, PEA.

Reference Books

1. Kohavi, Jha, "Switching and Finite Automata Theory", 3rd edition, Cambridge.
2. Leach, Malvino, Saha, "Digital Principles and Applications", 7th edition, TMH.
3. Roth, "Fundamentals of Logic Design", 5th edition, Cengage.

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DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. Computer Science– II Semester

Course - 4: DIGITAL LOGIC DESIGN

Course Code:

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I** **Number Systems**	2	2	24
2.	**Unit – II** **Logic Gates**	2	2	24
3.	**Unit – III** **Combinational Logic Circuits-1**	2	1	20
4.	**Unit – IV** **Combinational Logic Circuits-2**	2	1	20
5.	**Unit – V** **Sequential Logic Circuits**	2	2	24
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. Computer Science– II Semester
MODEL QUESTION PAPER
Course - 4: DIGITAL LOGIC DESIGN

Time : 3hrs **Course Code:** **Max Marks : 60**

I. Answer any Five of the following questions. **5 x 4 = 20**

1. Convert $1243_{(10)}$ to its equivalent Hexa-Decimal number. **(CO1) (L3)**
2. Give a short note on Weighted and un-weighted codes. **(CO1) (L2)**
3. Write about basic logic Gates. **(CO2) (L2)**
4. Give the truth tables for XOR and XNOR Gates.**(CO2) (L1)**
5. Explain about Half adder. **(CO3) (L2)**
6. Explain about Encoders. **(CO4) (L4)**
7. Write a short note on RS Flip-Flop. **(CO5) (L2)**
8. Explain about Shift Registers. **(CO5) (L4)**

SECTION-B

II. Answer the following questions. **5 x 8 = 40**

9. (a) Express the following numbers in decimal: **(CO1) (L4)**
   (i) $(10110.0101)_2$
   (ii) $(16.5)_{16}$
   (or)
   (b) What is Complement? Explain r's and (r-1)'s Complement. **(CO1) (L3)**

10. (a) Explain about realization of logic functions using Universal Gates. **(CO2) (L4)**
   (or)
   (b) Simplify the Boolean function using K-map in products of sums form: **(CO2) (L4)**
   $F(w,x,y,z)=\Sigma(2,3,10,11,12,13,14,15)$.

11. (a) Explain Full adder with the logic circuit diagram. **(CO3) (L4)**
   (or)
   (b) Give the circuit diagram for Half Subtractor. Explain. **(CO3) (L4)**

12. (a) Explain the working of 2X4 and 3X8 Decoder. **(CO4) (L4)**
   (or)
   (b) Explain about Multiplexer with reference circuit diagram. **(CO4) (L3)**

13. (a) Explain the principle of JK Flip-flop with the logic diagram and truth table. **(CO5) (L4)**
   (or)
   (b) Explain the operation of 4-bit universal shift register. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. Computer Science– II Semester

Course - 4: DIGITAL LOGIC DESIGN

Course Code: **No. of Hours/Week: 2**

List of Experiments

The laboratory work can be done by using physical gates and necessary equipment or simulators.

Simulators: https://sourceforge.net/projects/gatesim/ or https://circuitverse.org/ or any free open-source simulator

1. Introduction to digital electronics lab- nomenclature of digital ICs, specifications, study of the data sheet, concept of Vcc and ground, verification of the truth tables of logic gates using TTL ICs.
2. Implementation of the given Boolean functions using logic gates in both SOP and POS forms
3. Realization of basic gates using universal gates.
4. Design and implementation of half and full adder circuits using logic gates.
5. Design and implementation of half and full subtractor circuits using logic gates.
6. Verification of stable tables of RS, JK, T and D flip-flops using NAND gates.
7. Implementation and verification of Decoder and encoder using logic gates.
8. Implementation of 4X1 MUX and DeMUX using logic gates.
9. Implementation of 8X1 MUX using suitable lower order MUX.
10. Implementation of 7-segment decoder circuit.
11. Implementation of 4-bit parallel adder.
12. Design and verification of 4-bit modulus counter.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 5: OBJECT ORIENTED PROGRAMMING USING JAVA

Course Code: CS24301 **No. of Hours/Week: 3**

Course Objective:

To introduce the fundamental concepts of Object-Oriented programming and to design &implement object-oriented programming concepts in Java.

Course Outcomes:

Upon successful completion of the course, a student will be able to:
CO1: Understand the basic concepts of Object-Oriented Programming and Java Program Constructs
CO2: Implement classes and objects and analyze Inheritance and Dynamic Method Dispatch
CO3: Create packages and implement interfaces, exception handling to enhance program reliability
CO4: Develop multithreaded applications and utilize stream-based I/O for file handling in Java
CO5: Construct GUI screens with event handling.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	3	2	2	3
CO2	3	3	3	2	1	1	3	3	2	3
CO3	3	2	3	2	-	2	3	3	2	3
CO4	3	3	3	1	1	1	3	3	3	3
CO5	2	2	2	1	1	2	3	2	3	3
Average	2.8	2.4	2.6	1.4	0.6	1.4	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

OOPs Concepts and Java Programming: Introduction to Object-Oriented concepts, procedural and object-oriented programming paradigm

Java programming: An Overview of Java, Java Environment, Data types, Variables, constants,scope and life time of variables, operators, type conversion and casting, Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format(), Control Statements

UNIT-II

Arrays, Command Line Arguments, Strings-String Class Methods
Classes & Objects: Creating Classes, declaring objects, Methods, parameter passing, static fields and methods, Constructors, and 'this' keyword, overloading methods and access
Inheritance: Inheritance hierarchies, super and subclasses, member access rules, 'super' keyword, preventing inheritance: final classes and methods, the object class and its methods; **Polymorphism**: Dynamic binding, method overriding, abstract classes and methods.

UNIT-III

Interface: Interfaces Vs Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface;
Packages: Defining, creating and accessing a package, understanding CLASSPATH, importing packages.
Exception Handling: Benefits of exception handling, the classification of exceptions, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exception subclasses.

UNIT-IV

Multithreading: Differences between multiple processes and multiple threads, thread states, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.
Stream based I/O (java.io) – The Stream classes-Byte streams and Character streams, Reading console Input and Writing Console Output, File class, Reading and writing Files, The Console class, Serialization.

UNIT-V

GUI Programming with Swing- Introduction, MVC architecture, components, containers. Understanding Layout Managers - Flow Layout, Border Layout, Grid Layout, Card Layout, Grid Bag Layout.

Additional Inputs: constructor overloading, Access specifiers, **Event Handling**- The Delegation event model-Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes, Inner classes, Anonymous Inner classes, Java.lang packages

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill.
2. Understanding Object Oriented Programming with Java, updated edition,T. Budd, Pearson Education.

Reference Books

1. Cay S. Horstmann, “Core Java Fundamentals”, Volume 1, 11 th Edition, Prentice Hall,2018.
2. Paul Deitel, Harvey Deitel, “Java SE 8 for programmers”, 3rd Edition, Pearson, 2015.
3. S. Malhotra, S. Chudhary, Programming in Java, 2nd edition, Oxford Univ. Press.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – II Year III Semester

OBJECT ORIENTED PROGRAMMING USING JAVA

Course Code: CS24301 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Concepts and Java Programming ,** **Java Programming**	2	2	24
2	**Unit – II** **Arrays** **Classes and Objects** **Inheritance**	2	2	24
3	**Unit – III** **Interface** **Packages** **Exception Handling**	2	2	24
4	**Unit – IV** **Multithreading** **Stream based I/O**	2	1	20
5	**Unit – V** **GUI Programming with Swing** **Event Handling**	2	1	20
			Total Marks	112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

MODEL QUESTION PAPER
B.Sc. – II Year III Semester
OBJECT ORIENTED PROGRAMMING USING JAVA

Time : 3hrs **Course Code: CS24301** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4 = 20**

1. Why do we need to use OOPS concept? **(CO1) (L2)**
2. Write about type conversion and type casting. **(CO1) (L2)**
3. Write about the Arrays in Java. **(CO2) (L1)**
4. Explain the significance of "this" keyword with an example. **(CO2) (L2)**
5. Explain about the Packages in Java. **(CO3) (L2)**
6. List types of Exceptions. Explain any two. **(CO3) (L2)**
7. What is the difference between Process and Thread? **(CO4) (L3)**
8. What is the difference between AWT and Swing? **(CO5) (L3)**

SECTION-B

II. Answer the following questions. **5 X 8 = 40**

9. (a) Explain Object Oriented Programming Concepts. **(CO1) (L2)**

(or)

(b) Explain about Operators in Java. **(CO1) (L4)**

10. (a) Explain the process of creating a class and object with a simple program. **(CO2) (L3)**

(or)

(b) Explain the various forms of Inheritance with illustration. **(CO2) (L4)**

11. (a) Discuss about Interfaces with example. **(CO3) (L4)**

(or)

(b) Explain about the Exception handling with a simple program. **(CO3 (L4)**

12. (a) Explain about the Life Cycle of Threads. **(CO4) (L4)**

(or)

(b) Explain about FileInputStream and FileOutputStream **(CO4) (L4)**

13. (a) Write about the MVC Architecture Swing in Java. **(CO5) (L2)**

(or)

(b Describe Layout managers. Explain the Border layout with example. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

OBJECT ORIENTED PROGRAMMING USING JAVA LAB

Course Code: CS24301P **No. of Hours/Week: 2**

Course Objective:

To introduce various Object-Oriented Concepts through which the students will be enabled to implement classes, inheritance, interface, package and multithreading concepts.

Course Outcomes:

At the end of the course the student will be able to

CO1: Apply OOP concepts to solve real time problems.
CO2: Make use of class, inheritance, interface and packages to develop solutions for complex problems.
CO3: Build java applications using Exception handling and Threads.

List of Experiments

1. Write a Java program to print Fibonacci series using for loop.
2. Write a Java program to calculate multiplication of 2 matrices.
3. Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.
4. Write a Java program that implements method overloading.
5. Write a Java program for sorting a given list of names in ascending order.
6. Write a Java program that displays the number of characters, lines and words in a text file.
7. Write a Java program to implement various types of inheritance
   i. Single ii. Multi-Level iii. Hierarchical iv. Hybrid
8. Write a java program to implement runtime polymorphism.
9. Write a Java program which accepts withdraw amount from the user and throws an exception "In Sufficient Funds" when withdraw amount more than available amount.
10. Write a Java program to create three threads and that displays "good morning", for every one second, "hello" for every 2 seconds and "welcome" for every 3 seconds by using extending Thread class.
11. Write a Java program that creates three threads. First thread displays "OOPS", the second thread displays "Through" and the third thread Displays "JAVA" by using Runnable interface.
12. Implement a Java program for handling mouse events when the mouse entered, exited, clicked, pressed, released, dragged and moved in the client area.
13. Implement a Java program for handling key events when the key board is pressed, released, typed.
14. Write a Java swing program that reads two numbers from two separate text fields and display sum of two numbers in third text field when button "add" is pressed.
15. Write a Java program to design student registration form using Swing Controls. The form which having the following fields and button SAVE
    Form Fields are: Name, RNO, Mail id, Gender, Branch, Address.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 6: DATA STRUCTURES USING C

Course Code: CS24302 **No. of Hours/Week: 3**

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance ofvarious data structures in developing and implementing efficient algorithms.

Course Outcomes

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

CO1: Analyze algorithms and Understand various Data Structures including arrays for data storage and processing.
CO2: Realize Linked List Data Structure for various operations
CO3: Analyze step by step and develop algorithms to solve real world problems by implementing Stacks, Queues data structures.
CO4: Implement and compare various searching & sorting techniques.
CO5: Understand the Non-Linear Data Structures such as Binary Trees and Graphs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	1	2	1	3	2	2	2
CO2	3	2	2	1	2	2	3	2	3	3
CO3	3	-	-	1	-	1	3	3	3	3
CO4	3	1	1	1	1	1	3	3	3	3
CO5	2	-	-	-	-	1	3	3	3	3
Average	2.8	1	0.8	0.8	1	1.2	3	2.6	2.8	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Basic Concepts: Algorithm Analysis-Space Complexity, Time Complexity, Asymptotic Notation

Introduction to Data structures: Definition**,** Types of Data structure, Abstract Data Types (ADT), Difference between Abstract Data Types, Data Types, and Data Structures.

Arrays-Concept of Arrays, Single dimensional array, Two dimensional array, Operations on arrays with Algorithms (searching, traversing, inserting, deleting)

UNIT-II

Linked List: Concept of Linked Lists, Representation of linked lists in Memory, Comparison between Linked List and Array, Types of Linked Lists - Singly Linked list, Doubly Linked list, Circularly Singly Linked list, Circularly Doubly Linked list;

Implementation of Linked List ADT: Creating a List, Traversing a linked list, Searching linked list, Insertion and deletion into linked list (At first Node, Specified Position, Last node), Application of linked lists

UNIT-III

Stacks: Introduction to stack ADT, Representation of stacks with array and Linked List, Implementation of stacks, Application of stacks - Polish Notations - Converting Infix to Post Fix Notation - Evaluation of Post Fix Notation - Tower of Hanoi, Recursion: Concept and Comparison between recursion and Iteration

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

UNIT-IV

Searching: Linear or Sequential Search, Binary Search and Indexed Sequential Search
Sorting: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort and Merge Sort

UNIT-V

Binary Trees: Concept of Non- Linear Data Structures, Introduction Binary Trees, Types of Trees, Basic Definition of Binary Trees, Properties of Binary Trees, Representation of Binary Trees, Operations on a Binary Search Tree, Binary Tree Traversal, Applications of Binary Tree.

Graphs: Introduction to Graphs, Terms Associated with Graphs, Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs (DFS, BFS), and Applications of Graphs.

Additional Inputs: Spanning Trees, properties of spanning trees, Minimum Spanning trees, Prim's Algorithm, Krushkal's Algorithm and Dijkstra's Algorithm

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publications Pvt LtdDelhi India
2. A.K. Sharma ,Data Structure Using C, Pearson Education India.
3. "Data Structures Using C" Balagurusamy E. TMH

Reference Books

1. "Data Structures through C", Yashavant Kanetkar, BPB Publications.
2. Rajesh K. Shukla, "Data Structure Using C and C++" Wiley Dreamtech Publication.
3. Lipschutz, "Data Structures" Schaum's Outline Series, Tata Mcgraw-hill Education (India)Pvt.Ltd.
4. Michael T.Goodrich,RobertoTamassia, David M.Mount "Data Structures and Algorithms in C++", Wiley India.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – II Year IV Semester

DATA STRUCTURES USING C

Course Code: CS24302 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Basic Concepts in DS using C** **Introduction to Data Structures** **Arrays**	2	2	24
2	**Unit – II** **Linked Lists** **Implementation of Linked list ADT**	2	2	24
3	**Unit – III** **Stacks** **Queues**	2	1	20
4	**Unit – IV** **Searching** **Sorting**	2	1	20
5	**Unit – V** **Binary Trees** **Graphs**	2	2	24
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
MODEL QUESTION PAPER
B.Sc. II YEAR - IV SEMESTER
DATA STRUCTURES USING C

Time : 3hrs **Course Code: CS24302** **Max Marks : 60**

SECTION - A

II. Answer any FIVE of the following questions. **5x4=20**

9. Explain about Recursion. **(CO1) (L2)**
10. Discuss briefly about Asymptotic Notation. **(CO1) (L4)**
11. What is an ADT? Discuss about Array ADT. **(CO2) (L2)**
12. Discuss briefly about types of Circular linked lists. **(CO2) (L4)**
13. What are the applications of Stack? Explain. **(CO3) (L2)**
14. Explain about Circular Queue. **(CO3) (L2)**
15. Discuss briefly about insertion in Binary Search Trees. **(CO5) (L4)**
16. Write short notes on Linear Search. **(CO4) (L1)**

SECTION-B

II. Answer the following questions. **5x8=40**

10. (a) Define Data Structures. Elucidate different types of Data Structures. (**CO1) (L4)**

(Or)

(b) How to declare, initialize and access the elements of a 2 Dimensional Array? **(CO1) (L4)** Explain with example.

10. (a) Write a program to illustrate insertion and deletions in a single linked list. **(CO2) (L6)**

(Or)

(b) What is a Linked List? Distinguish between different types of Linked lists. **(CO2) (L4)**

11. (a) Illustrate the operations on Stack with an example. **(CO3) (L3)**

(Or)

(b) Discuss Queue and its implementation using Arrays. **(CO3) (L4)**

12. (a) Discuss Quick Sort with an example. **(CO4) (L4)**

(Or)

(b) Explain about Binary search with an example. **(CO4) (L4)**

13. (a) Explain about various Graph Traversals. **(CO5) (L4)**

(Or)

(b) Define Binary Search Tree. List and explain operations on BST. **(CO5) (L2)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – IV Semester

Course 6: DATA STRUCTURES USING C LAB

Course Code: CS24302P **No. of Hours/Week: 2**

Course Objective:

To implement data structures for problem solving and to implement and analyze the searching algorithms in the context of specific engineering problems.

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Course Outcomes:

At the end of the course the student will be able to

CO1: Implement linear and non-linear data structure operations using C programs

CO2: Solve problems implementing appropriate data structures

CO3: Implement sorting and searching algorithms using relevant data structures

List of Experiments

1. Write a program to read 'N' numbers of elements into an array and also perform thefollowing 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 Program to implement Single Linked List with insertion, deletion and traversaloperations
3. Write Program to implement Circular doubly Linked List with insertion, deletion and traversal operations
4. Write Programs to implement the Stack operations using an array
5. Write a program using stacks to convert a given infix expression to postfix
6. Write Programs to implement the Stack operations using Liked List.
7. Write Programs to implement the Queue operations using an array.
8. Write Programs to implement the Queue operations using Liked List.
9. Write a program for Binary Search Tree Traversals
10. Write a program to search an item in a given list using the following Searching Algorithms
    a) Linear Search b) Binary Search.
11. Write a program for implementation of the following Sorting Algorithms
    a. Bubble Sort b) Insertion Sort c) Quick Sort

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 7: COMPUTER ORGANIZATION

Course Code:CS24303 **No. of Hours/Week: 3**

Course Objectives

To familiarize with organizational aspects of memory, processor and I/O.

Course Outcomes

Upon successful completion of the course, the students will be able to

CO1: Describe register transfer language and perform basic micro-operations

CO2: Distinguish between various instruction formats and identify the significance of micro-programmed and hard-wired control units.

CO3: Analyze the performance of hierarchical organization of memory.

CO4: Summarize different data transfer techniques.

CO5: Demonstrate arithmetic operations on fixed- and floating-point numbers and illustrate concepts of parallel processing.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	-	1	1	1	3	2	2	3
CO2	3	2	1	2	1	2	3	3	2	3
CO3	3	2	-	2	2	2	3	3	2	3
CO4	3	1	1	1	1	2	3	3	3	3
CO5	2	1	1	1	1	3	3	2	3	3
Average	2.8	1.4	0.6	1.4	1.2	2	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT – I

Register Transfer Language and Micro Operations: Introduction- Functional units, computer registers, register transfer language, register transfer, bus and memory transfers, arithmetic, logic and shift micro-operations, arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, instruction cycle, Register reference instructions, Memory – reference instructions, input – output and interrupt.

UNIT – II

CPU and Micro Programmed Control: Central Processing unit: Introduction, instruction formats, addressing modes, Control memory, address sequencing, design of control unit - hard wired control, micro programmed control.

UNIT – III

Memory Organization: Memory hierarchy, main memory, auxiliary memory, associative memory, cache Memory and mappings.

UNIT – IV

Input-Output Organization: Peripheral Devices, input-output interface, asynchronous data transfer, modes of transfer- programmed I/O, priority interrupt, direct memory access, Input – Output Processor (IOP).

UNIT – V

Computer Arithmetic and Parallel Processing: Data representation- fixed point, floating point,addition and subtraction, multiplication and division algorithms.

Parallel Processing-Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline.

Additional Inputs: Stack Organization,

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. M. Moris Mano, "Computer Systems Architecture", 3rd edition, Pearson/ PHI.

Reference Books:

1. Carl Hamacher, ZvonksVranesic, SafeaZaky, "Computer Organization", 5th edition, McGrawHill.
2. William Stallings, "Computer Organization and Architecture", 8th edition, Pearson/PHI.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

II B.Sc. – III Semester

COMPUTER ORGANIZATION

Course Code:CS24303 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Register Transfer language and Micro Operations**	1	1	12
2	**Unit – I** **Basic Computer Organization and Design**	1	1	12
3	**Unit – II** **CPU and Micro Programmed Control**	2	2	24
4	**Unit – III** **Memory Organization**	2	1	20
5	**Unit – IV** **Input- Output Organization**	2	1	20
6	**Unit – V** **Compute Arithmetic and Parallel Processing**	2	2	24
Total Marks				112

A.S.D. GOVT. DEGREE COLLEGE FOR WOMEN(A), KAKINADA

MODEL QUESTION PAPER

B.Sc. II YEAR - III SEMESTER

C 7 – COMPUTER ORGANIZATION

Time : 3hrs **Course Code: CS24303** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4=20**

1. What is a micro operation? Give examples. **(CO1) (L2)**
2. What is an instruction code? Explain. **(CO1) (L1)**
3. Compare and contrast different instruction formats. **(CO2) (L2)**
4. Write a short note on control memory. **(CO2) (L1)**
5. Give a brief account on various types of memory. **(CO3) (L4)**
6. Elucidate Priority interrupt. **(CO4) (L2)**
7. Discuss briefly about Instruction pipelining. **(CO5) (L2)**
8. Write about fixed point representation. **(CO5) (L1)**

SECTION-B

II. Answer the following questions. **5 X 8=40**

9. (a) Explain Register Reference Instructions with an example. **(CO1) (L4)**

(or)

(b) What is an Instruction cycle? Explain different phases involved in instruction cycle with a flowchart. **(CO1) (L4)**

10. (a) Define addressing mode. Analyze different types of Addressing modes with examples. **(CO2) (L4)**

(or)

(b) Elucidate Micro-programmed control unit in detail. **(CO2) (L3)**

11. (a) Explain the organization of Associative memory with a neat sketch. **(CO3) (L4)**

(or)

(b) Discuss Cache Memory and its mapping techniques. **(CO3) (L4)**

12. (a) Compare and contrast various types of Asynchronous Data transfer **(CO4) (L5)**

(or)

(b) Explain Direct Memory Access. **(CO4) (L4)**

13. (a) Discuss Flynn's taxonomy of parallel processing. **(CO5) (L4)**

(or)

(b) Elaborate Booth's Multiplication algorithm. **(CO5) (L5)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course7: COMPUTER ORGANIZATION LAB

Course Code: CS24303P **No. of Hours/Week: 2**

Course Objectives

To develop an understanding of how computing technology presents new ways to address problems.

Course Outcomes:

At the end of the course, the student will be able to

CO1: Implement various Arithmetic operations on binary numbers

CO2: Develop skills in writing assembly language code using different instruction formats and addressing modes

CO3: Implement various micro-operations

Lab Experiments

1. Implement a C program to convert a Hexadecimal, octal, and binary number to decimalnumber vice versa.
2. Implement a C program to perform Binary Addition & Subtraction.
3. Implement a C program to perform Multiplication of two binary numbers.
4. Implement arithmetic micro-operations using logic gates.
5. Implement logic and shift micro-operations using logic gates.
6. Implement a C program to perform Multiplication of two binary numbers (signed) using Booth's Algorithms.
7. Implement a C program to perform division of two binary numbers (Unsigned) usingrestoring division algorithm.
8. Implement a C program to perform division of two binary numbers (Unsigned) using non-restoring division algorithm.
9. Write assembly language code for A+B*(C-D) using various instruction formats in MASM orany open-source assembler.
10. Write assembly language code for A+B*C using various addressing modes in MASM or anyopen-source assembler.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 8: OPERATING SYSTEMS

Course Code: CS24304 **No. of Hours/Week: 3**

Course Objective:

To gain knowledge about various functions of an operating system like memory management, process management, device management, etc.

Course Outcomes:

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

CO1: Demonstrate knowledge and comprehension of operating system functions.
CO2: Analyze different process scheduling algorithms and apply them to manage processes and threads effectively
CO3: Create strategies to prevent, detect, and recover from deadlocks, and design solutions for inter-process communication and synchronization problems.
CO4: Compare and contrast different memory allocation strategies and evaluate their effectiveness.
CO5: Evaluate disk scheduling algorithms while implementing OS security measures.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	-	-	1	1	-	2	1	2	3
CO2	3	2	1	-	2	-	3	2	3	3
CO3	3	2	2	2	3	2	3	3	3	3
CO4	2	2	1	1	2	2	3	2	2	2
CO5	3	3	2	1	2	2	3	2	3	3
Average	2.6	1.8	1.2	1	2	1.2	2.8	2	2.6	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT- I

What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time System.

UNIT- II

Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread Libraries; **Process Scheduling**- Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT III

Process Management: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery. Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer.

UNIT IV

Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies–Fixedand -Variable Partitions, Paging, Page Replacement Algorithms: FIFO, LRU, LFU, Optimal, Segmentation, Virtual Memory.

UNIT V

File and I/O Management, OS security: Directory Structure, File Operations, File AllocationMethods, Device Management, Pipes, Buffer, Shared Memory, Disk Scheduling algorithms: FCFS,SSTF, SCAN, CSCAN.

Additional Inputs:

Inter process Communication in Linux, Multithreading: Benefits, Multithreading Models

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and GregGagne(7th Edition) Wiley India Edition.

Reference Books

1. Operating Systems: Internals and Design Principles by Stallings (Pearson)
2. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH)

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. – II YEAR III SEMESTER

OPERATING SYSTEMS

Course Code: CS24304 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I Operating System Introduction**	**2**	**2**	**24**
2.	**Unit – II Processor and User Models**	**2**	**2**	**24**
3.	**Unit – III Process Scheduling**	**2**	**2**	**24**
4.	**Unit – IV Memory Management**	**2**	**1**	**20**
5.	**Unit – V File, I/O Management and OS Security**	**2**	**1**	**20**
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

MODEL QUESTION PAPER

B.Sc. II YEAR - III SEMESTER

OPERATING SYSTEMS

Time : 3hrs **Course Code:CS24304** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Give the functions of Multitasking Operating Systems. **(CO1) (L1)**
2. Discuss briefly the objectives of Operating Systems. **(CO1) (L4)**
3. Explain about System Call. **(CO2) (L2)**
4. What is the Scheduling Criteria for Process Scheduling Algorithms? **(CO2) (L2)**
5. Discuss about the necessary conditions for a Deadlock. **(CO3) (L4)**
6. Write about Process Synchronization. **(CO3) (L2)**
7. Write about Segmentation. **(CO4) (L3)**
8. Explain about Pipes. **(CO5) (L2)**

SECTION-B

II. Answer ALL the following questions. **5x8=40**

9. (a) Explain the functions of the operating system. **(CO1) (L4)**

   (or)

   (b) List the types of Operating Systems. Explain. **(CO1) (L2)**

10. (a) Explain about FCFS and SJF Process Scheduling Algorithm with an example. **(CO2) (L4)**

    (or)

    (b) Explain Process Control block and Process state with a neat sketch. **(CO2) (L4)**

11. (a) Explain the deadlock detection techniques. **(CO3) (L4)**

    (or)

    (b) What is critical section? Elaborate the significance of Semaphores in Process synchronization. **(CO3) (L5)**

12. (a) Explain about Memory Allocation Strategies. **(CO4) (L4)**

    (or)

    (b) What is Virtual Memory? Discuss the method for handling Page fault with illustration. **(CO4) (L4)**

13. (a) Explain the Indexed File allocation method with an example. **(CO5) (L4)**

    (or)

    (b) Explain about SCAN and CSCAN Disk Scheduling Algorithms. **(CO5) (L2)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 8: OPERATING SYSTEMS LAB USING C

Course Code:CS24304P **No. of Hours/Week: 2**

Course Objective:

To impart knowledge on Operating System design Principles and demonstrate Process Scheduling and Page Replacement Algorithms.

Course Outcomes:

At the end of the course the student will be able to

1. Implement Process Scheduling and Page Replacement Algorithms.
2. Implement Various File Organization schemes
3. Implement Deadlock Avoidance and prevention algorithms

List of Experiments

1. Illustrate the LINUX commands
    a) pwd
    b) mkdir
    c) rmdir
    d) grep
    e) chmod
    f) ls
    g) rm
    h) cp
2. Write a program to calculate average waiting time and turn around time of each process using the following CPU Scheduling algorithm for the given process schedules.
    a) FCFS b) SJF
    c) Priority d) Round Robin
3. Simulate MVT and MFT memory management techniques
4. Write a program for Bankers Algorithm for Dead Lock Avoidance
5. Implement Bankers Algorithm Dead Lock Prevention.
6. Write a program to simulate Producer-Consumer problem.
7. Simulate all Page replacement algorithms.
    a) FIFO b) LRU
    c) LFU d) Optimal
8. Simulate Paging Techniques of memory management
9. Simulate the following disk scheduling algorithms
    a) FCFS b) SSTF c) SCAN d) CSCAN

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

II YEAR - III SEMESTER
SKILL COURSE
INFORMATION & COMMUNICATION TECHNOLOGY
(Common to B.Sc./B.A./B.Com.)

Course Code: ICT24303-SC **No. of Hours/Week:2**

Course 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;

CO1: Understand the literature of social networks and their properties.

CO2: Develop skills to use various social networking sites like twitter, flickr, etc.,

CO3: Apply skills to use Email, online forums, docs, spreadsheets, etc. through G-Suite, for communication,collaboration and research.

CO4: Learn few GOI digital initiatives in higher education.

CO5: Get acquainted with internet threats and security mechanisms.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	3	2	1	1	3	2	3	2
CO2	3	2	3	2	1	1	2	2	3	2
CO3	2	2	3	2	2	1	2	1	2	2
CO4	2	3	3	2	2	1	3	2	3	3
CO5	2	1	3	2	2	1	2	1	3	3
Average	2.2	2	3	2	1.6	1	2.4	1.6	2.8	2.4

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Fundamentals of Internet: What is Internet?, 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, WhatsApp .

UNIT-II

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

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, e- acharya, e-Yantra and NPTEL).

Text Books:

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

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

DEPARTMENT OF COMPUTER SCIENCE

II YEAR III SEMESTER

SKILL COURSE

INFORMATION & COMMUNICATION TECHNOLOGY

(Common to B.Sc./B.A./B.Com.)

Course Code: ICT24303-SC **No. of Hours/Week:2**

BLUE PRINT

S.No.	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Fundamentals of Internet**	2	2	24
2	**Unit – II** **E-mail and G-Suite**	2	2	24
3	**Unit – III** **Overview of Internet Security**	2	2	24
Total Marks				72

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II YEAR III SEMESTER

SKILL COURSE

MODEL QUESTION PAPER

INFORMATION & COMMUNICATION TECHNOLOGY

(Common to B.Sc./B.A./B.Com.)

Time: 2 Hrs **Course Code:ICT24303-SC** **Max. Marks: 40**

SECTION-A

I. Answer any FOUR of the following questions. **4 x 4 = 16**

1. Write about the fundamentals of Internet. **(CO1) (L2)**
2. How to search for information through Internet? **(CO2) (L1)**
3. What are the advantages of E-mail? **(CO3) (L2)**
4. Write about Domain Names. **(CO3) (L1)**
5. What is Firewall? **(CO5) (L1)**
6. Explain about E-Sodh-Sindhu and NPTEL. **(CO4) (L2)**

SECTION-B

II. Answer the following questions. **3 x 8 = 24**

7. (a) Explain about various social networks. **(CO2) (L4)**

(or)

(b) What is Internet? Summarize the applications of Internet. **(CO1) (L4)**

8. (a) What is E-mail? Explain advantages and disadvantages of E-mail. **(CO3) (L4)**

(or)

(b) How to use Google documents, spreadsheets and Google forms? Interpret their usage.**(CO3) (L5)**

9. (a) Explain briefly about E-mail threats. **(CO5) (L5)**

(or)

(b) List the GOI digital initiatives in higher education. Explain. **(CO4) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

Course 9: DATABASE MANAGEMENT SYSTEMS

Course Code:CS24401 **No. of Hours/Week: 3**

Course Objectives

To familiarize with concepts of database design

Course Outcomes:

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

CO1: Differentiate between database systems and file based systems

CO2: Design a database using ER model

CO3: Make use of relational model in database design

CO4: Utilize SQL commands for creating and manipulating data stored in databases.

CO5: Write PL/SQL programs to work with databases.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	3	2	2	3
CO2	3	3	3	2	1	1	3	3	2	3
CO3	3	2	3	2	-	2	3	3	2	3
CO4	3	3	3	1	1	1	3	3	3	3
CO5	2	2	2	1	1	2	3	2	3	3
Average	2.8	2.4	2.6	1.4	0.6	1.4	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT- I

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 - II

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 - III

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, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms upto 3rd normal form.

UNIT - IV

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

UNIT - V

PL/SQL: Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements, DataTypes, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.

Additional Inputs:
Transaction Management and Concurrency Control: What is transaction, ACID Properties, Concurrency control

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill, 2010.
2. Fundamentals of Relational Database Management Systems by S. Sumathi, S. Esakkirajan, Springer Publications.

Reference Books

1. Database Management Systems by Raghu Ramakrishnan, McGrawhill
2. Principles of Database Systems by J. D. Ullman
3. Fundamentals of Database Systems by R. Elmasri and S. Navathe
4. SQL: The Ultimate Beginners Guide by Steve Tale.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR IV SEMESTER

DATABASE MANAGEMENT SYSTEMS

(B.Sc. Computer Science Major)

Course Code:CS24401 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I Overview of Database Management System**	2	2	24
2	**Unit – II Entity-Relationship Model**	2	2	24
3	**Unit – III Relational Model**	2	2	24
4	**Unit – IV Structured Query Language**	2	1	20
5	**Unit – V PL/SQL**	2	1	20
			Total Marks	112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
MODEL QUESTION PAPER

B.Sc. - II YEAR IV SEMESTER
DATABASE MANAGEMENT SYSTEMS
(B.Sc. Computer Science Major)

Time : 3hrs **Course Code: CS24401** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4=20**

1. Discuss briefly the components of DBMS. **(CO1) (L4)**
2. Summarize the drawbacks of File System. **(CO1) (L2)**
3. Elucidate EER. **(CO2) (L2)**
4. Classify Relationships based on entity sets participation. **(CO2) (L2)**
5. Explain about Aggregate Functions. **(CO4) (L2)**
6. Write a short note on CODD rules. **(CO3) (L2)**
7. Give a brief account on Procedures in PL/SQL. **(CO5) (L1)**
8. Explain set operations in Relation Algebra. **(CO4) (L3)**

SECTION-B

II. Answer the following questions. **5 X 8=40**

9. (a) Define DBMS. Explain the advantages of DBMS. **(CO1) (L4)**

   (Or)

   (b) Elucidate Database System Architecture with a neat sketch. (**CO1) (L4)**

10. (a) Interpret the building blocks of an entity relationship diagram with illustration. **(CO2) (L6)**

    (Or)

    (b) Discuss IS A relationship and attribute inheritance. **(CO2) (L5)**

11. (a) Discuss relational algebra, operations and advantages of relational algebra. **(CO3) (L4)**

    (Or)

    (b) Distinguish between INF and 2NF in detail. **(CO3) (L4)**

12. (a) Categorize DDL Commands based on their purpose with illustrations. **(CO4) (L5)**

    (Or)

    (b) Compare and contrast various DML Commands. **(CO4) (L5)**

13. (a) Discuss control structures used in PL/SQL. **(CO5) (L4)**

    (Or)

    (b) Illustrate the use of triggers in detail with an example. **(CO5) (L3)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

Course 9: DATABASE MANAGEMENT SYSTEMS LAB
(B.Sc. Computer Science Major)

Course Code:CS24401P **No. of Hours/Week: 2**

Course Objective:

To provide a strong formal foundation in database concepts and emphasis is on practice to the students to groom them into well-informed database application developers.

Course Outcomes:

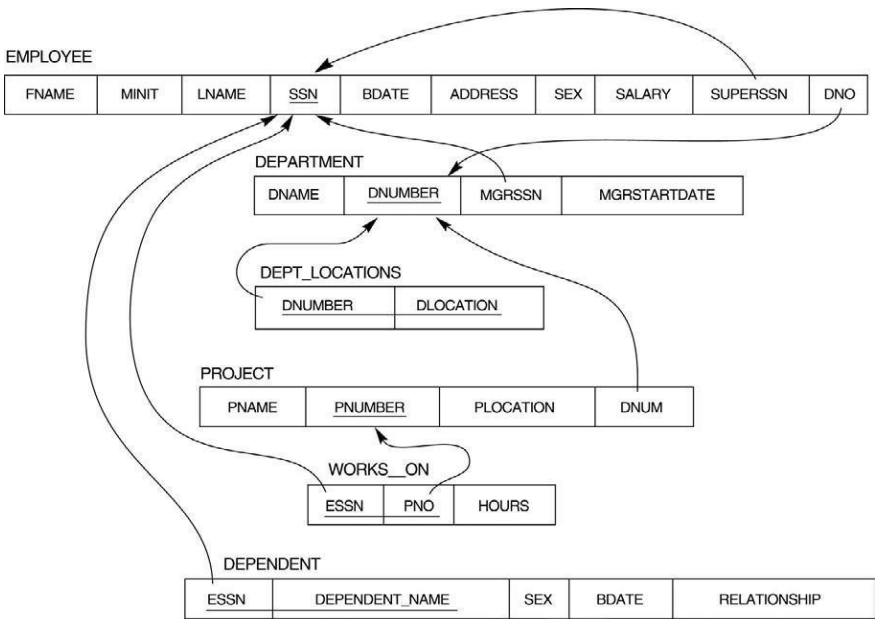
At the end of the course the student will be able to

CO1: Design database and ER diagrams for the real world scenarios.
CO2: Understand ER concepts and ER mapping to relational model.
CO3: Make use of SQL and PL/SQL to efficiently retrieve and maintain relational database.

Lab Experiments

1. Draw ER diagram for hospital administration
2. Creation of college database and establish relationships between tables
3. Relational database schema of a company is given in the following figure.

Relational Database Schema - COMPANY



Questions to be performed on above schema

1. Create above tables with relevant Primary Key, Foreign Key and other constraints
2. Populate the tables with data

3. Display all the details of all employees working in the company.
4. Display ssn, lname, fname, address of employees who work in department no 7.
5. Retrieve the Birthdate and Address of the employee whose name is 'Franklin T. Wong'
6. Retrieve the name and salary of every employee
7. Retrieve all distinct salary values
8. Retrieve all employee names whose address is in ‘Bellaire’
9. Retrieve all employees who were born during the 1950s
10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
11. Retrieve the names of all employees who do not have supervisors
12. Retrieve SSN and department name for all employees
13. Retrieve the name and address of all employees who work for the 'Research' department
14. For every project located in 'Stafford', list the project number, the controlling department number, and the
    department manager's last name, address, and birth date.
15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
16. Retrieve all combinations of Employee Name and Department Name
17. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan’ either as a worker or as a manager of the department that controls the project.
18. Increase the salary of all employees working on the 'Product X' project by 15%. Retrieve employee name and increased salary of these employees.
19. Retrieve a list of employees and the project name each works in, ordered by the employee'sdepartment, and within each department ordered alphabetically by employee first name.
20. Select the names of employees whose salary does not match with salary of any employee in department 10.
21. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, andthe average salary. Display with proper headings.
23. Find the sum of the salaries and number of employees of all employees of the ‘Marketing’ department, as
    well as the maximum salary, the minimum salary, and the average salary in this department.
24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
25. Delete all dependents of employee whose ssn is ‘123456789’.
26. Perform a query using alter command to drop/add field and a constraint in Employee table.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

Course 10: OBJECT ORIENTED SOFTWARE ENGINEERING
(B.Sc. Computer Science Major)

Course Code: CS24402 **No. of Hours/Week: 3**

Course Objective:

To introduce Object-oriented software engineering (OOSE) - which is a popular technical approachin analyzing, designing an application, system, or business by applying the object- oriented paradigm and visual modeling.

Course Outcomes:

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

CO1: Understand and apply the fundamental principles of Object-Oriented Programming (OOP) concepts and Unified Modelling Language (UML) basics, in the development of software solutions.

CO2: Analyse and specify software requirements, develop use cases and scenarios, apply object- oriented analysis and design (OOAD) principles

CO3: Implement software construction principles using object-oriented programming languages and apply testing methodologies

CO4: Analyse and Evaluate Software Maintenance and Evolution Strategies

CO5: Apply Advanced Object-Oriented Software Engineering Concepts.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	2	1	1	3	2	2	2
CO2	3	2	3	2	1	2	3	2	2	3
CO3	2	2	3	1	1	1	2	1	2	3
CO4	3	2	3	2	1	1	3	3	2	2
CO5	3	2	3	1	1	1	3	3	2	2
Average	2.8	2	3	1.6	1	1.2	2.8	2.2	2	2.4

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Introduction to Object-Oriented Programming: Overview of software engineering, Introduction to Object-Oriented Programming (OOP) concepts (classes, objects, inheritance, polymorphism), Unified Modelling Language (UML) basics, Introduction to software development process and softwaredevelopment life cycle (SDLC).

UNIT-II

Requirements Analysis and Design: Requirements analysis and specification, Use cases and scenarios, Object-oriented analysis and design (OOAD), Design patterns, UML modelling techniques(class diagrams, sequence diagrams, state machine diagrams, activity diagrams)

UNIT-III

Software Construction and Testing: Software construction basics, Object-oriented design principles, Object-oriented programming languages (Java, C++, Python), Software testing basics (unit testing, integration testing, system testing), Test-driven development (TDD)

UNIT-IV

Software Maintenance and Evolution: Software maintenance basics, refactoring techniques Software version control, Code review and inspection, Software evolution and reengineering.

UNIT-V

Advanced Topics in Object-Oriented Software Engineering: Model-driven engineering (MDE), Aspect-oriented programming (AOP), Component-based software engineering (CBSE), Service- oriented architecture (SOA), Agile software development and Scrum methodologies.

Additional Inputs: Requirement Elicitation Techniques, Software Development Life Cycle (SDLC) Models: Waterfall, Incremental, Spiral, Agile

Note: Additional Inputs must be excluded from evaluation

Text Books

1. An Introduction to Object-Oriented Analysis and Design and the Unified Process, 3rdEdition, Craig Larman, Prentice-Hall.
2. Programming in Java by Sachin Malhotra, Oxford University Press

Reference Books

1. Requirements engineering: processes and techniques, G.Kotonya and, I.Sommerville, 1998,Wiley
2. Design Patterns, E.Gamma, R. Helm, R. Johnson, and J. Vlissides
3. The Unified Modeling Language Reference Manual, J. Rumbaugh, I.Jacobson and G.Booch, Addison Wesley

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

OBJECT ORIENTED SOFTWARE ENGINEERING
(B.Sc. Computer Science Major)

Course Code: CS24402 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I Object-Oriented Programming**	2	2	24
2	**Unit – II Requirements Analysis and Design**	2	2	24
3	**Unit – III Software Construction and Testing**	2	2	24
4	**Unit – IV Software Maintenance and Evolution**	2	1	20
5	**Unit – V Advanced Topics in Object-Oriented Software Engineering**	2	1	20
			Total Marks	**112**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR IV SEMESTER

MODEL QUESTION PAPER

OBJECT ORIENTED SOFTWARE ENGINEERING

(B.Sc. Computer Science Major)

Time : 3hrs **Course Code: CS24402** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Explain polymorphism in OOP. **(CO1) (L2)**
2. Explain the importance of UML in the software development process. **(CO1) (L2)**
3. What is a use case, and how is it utilized in the requirements analysis process? **(CO2) (L2)**
4. Distinguish between a class diagram and a sequence diagram in UML. **(CO2) (L4)**
5. Describe the main advantages of using an object-oriented Design in Software development. **(CO3) (L2)**
6. Compare and contrast corrective and adaptive maintenance with examples. **(CO3) (L5)**
7. Explain the advantages of Service-Oriented Architecture (SOA). **(CO4) (L2)**
8. What are the key roles and ceremonies in the Scrum framework? **(CO5) (L1)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Discuss the Principles and Advantages of Object-Oriented Programming (OOP). **(CO1) (L4)**

   (or)

   (b) Briefly describe the stages of the Software Development Life Cycle (SDLC). **(CO1) (L2)**

10. (a) Explain the need for requirements analysis and specification in the software development process. **(CO2) (L4)**

    (or)

    (b) Elaborate the principles and practices of Object-Oriented Analysis and Design (OOAD). **(CO2) (L4)**

11. (a) Discuss the evolution of software construction, emphasizing its significance in modern software development. **(CO3) (L4)**

    (or)

    (b) Explain about different types of Software Testing. **(CO3) (L4)**

12. (a) Describe the significance of software maintenance in the software development lifecycle. **(CO4) (L2)**

    (or)

    (b) Analyse the concept of refactoring and its role in improving code quality. **(CO4) (L4)**

13. (a) Discuss the concept of Model-Driven Engineering (MDE) and its application in modern software development. **(CO5) (L4)**

    (or)

    (b) Summarize the key principles of Agile Software Development **(CO5) (L2)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR - IV SEMESTER

OBJECT ORIENTED SOFTWARE ENGINEERING LAB
(B.Sc. Computer Science Major)

Course Code:CS24402P **No. of Hours/Week: 2**

Course Objective:
To develop projects using Object Oriented analysis, design and testing techniques.

Course Outcomes:
At the end of the course, the student will be able to
CO1: Understand the software engineering methodologies involved in the phases for project development.
CO2: Gain knowledge about open source tools used for implementing software engineering methods.
CO3: Apply UML concepts in software development.

Suggested Software Tools: Star UML/UMLGraph/Topcased/Umberollo/ArgoUML/ Eclipse IDE, Visual Paradigm for UML/Rational Software Architect/Any other Open Source Tool

List of Experiments:

Select domain of interest (e.g. College Management System) and identify multi-tier software application to work on (e.g. Online Fee Collection). Analyze, design and develop this application using OOSE approach:

1. Develop an IEEE standard SRS document. Also develop risk management and project plan(Gantt chart).
2. Understanding of System modeling: Data model i.e. ER – Diagram and draw the ER Diagramwith generalization, specialization and aggregation of specified problem statement
3. Understanding of System modeling: Functional modeling: DFD level 0 i.e. Context Diagramand draw it
4. Understanding of System modeling: Functional modeling: DFD level 1 and DFD level 2 anddraw it.
5. Identify use cases and develop the use case model.
6. Identify the business activities and develop an UML Activity diagram.
7. Identity the conceptual classes and develop a domain model with UML Class diagram.
8. Using the identified scenarios find the interaction between objects and represent them usingUML Interaction diagrams.
9. Draw the state chart diagram.
10. Identify the user interface, domain objects, and technical services. Draw the partial layered,logical architecture diagram with UML package diagram notation.
11. Implement the technical services layer.
12. Implement the domain objects layer.
13. Implement the user interface layer.
14. Draw component and deployment diagrams.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

Course 11: DATA COMMUNICATION AND COMPUTER NETWORKS

Course Code: CS24403 **No. of Hours/Week: 3**

Course Objectives

To provide students with a comprehensive understanding of networking principles, protocols, and technologies, enabling them to design, analyze, and evaluate efficient and reliable network solutions.

Course Outcomes

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

CO1: Understand and apply network applications, hardware, software, and reference models for network communication.

CO2: Design and analyse data link layer protocols, multiple access protocols, and wireless LAN technologies.

CO3: Evaluate network layer design, routing algorithms, and congestion control

CO4: Analyse transport service, transport protocols, and evaluate UDP and TCP in the internet.

CO5: Understand application layer protocols, including DNS, HTTP, and SMTP, and their roles in network communications.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	2	1	1	3	2	2	2
CO2	3	2	3	2	1	1	3	3	2	2
CO3	2	2	3	1	1	1	2	3	1	2
CO4	3	2	3	2	2	1	3	2	3	2
CO5	3	2	3	1	1	1	3	2	3	2
Average	2.8	2	3	1.6	1.2	1	2.8	2.4	2.2	2

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

INTRODUCTION: Network applications, network hardware, network software, reference models: OSI, TCP/IP, Internet, Connection oriented network - X.25, frame relay.

THE PHYSICAL LAYER: Theoretical basis for communication, guided transmission media, wireless transmission, the public switched telephone networks, mobile telephone system.

UNIT-II

THE DATA LINK LAYER: Design issues, error detection and correction, elementary data link protocols, sliding window protocols, example data link protocols - HDLC, the data link layer on the internet.

THE MEDIUM ACCESS SUBLAYER: Channel allocations problem, multiple access protocols, Ethernet, Data Link Layer switching, Wireless LAN, Broadband Wireless, Bluetooth.

UNIT-III

THE NETWORK LAYER: Network layer design issues, routing algorithms, Congestion control algorithms, Internetworking, the network layer in the internet (IPv4 and IPv6), Quality of Service.

UNIT-IV

THE TRANSPORT LAYER: Transport service, elements of transport protocol, Simple Transport Protocol, Internet transport layer protocols: UDP and TCP.

UNIT-V

THE APPLICATION LAYER: Domain name system, electronic mail, World Wide Web:architectural overview, dynamic web document and http.

APPLICATION LAYER PROTOCOLS: Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet.

Additional Inputs: Classful Addressing, Subnetting, Subnet Masking, Supernetting, and CIDR.

Text Books

1. S. Tanenbaum (2003), Computer Networks, 4th edition, Pearson Education/ PHI, NewDelhi, India

Reference Books

1. Behrouz A. Forouzan (2006), Data communication and Networking, 4th Edition, McGraw-Hill, India.
2. Kurose, Ross (2010), Computer Networking: A top down approach, PearsonEducation, India.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

DATA COMMUNICATION AND COMPUTER NETWORKS

Course Code: CS24403 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Introduction** **The Physical Layer**	2	2	24
2	**Unit – II** **The Data Link Layer** **The Medium Access Sublayer**	2	2	24
3	**Unit – III** **Network Layer**	2	1	20
4	**Unit – IV** **The Transport Layer**	2	1	20
5	**Unit – V** **The Application Layer** **Application Layer Protocols**	2	2	24
			Total Marks	**112**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR IV SEMESTER

MODEL QUESTION PAPER

DATA COMMUNICATION AND COMPUTER NETWORKS

Time: 3hrs **Course Code: CS24403** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Explain about different types of networks. **(CO1) (L2)**
2. Discuss the functions of Physical Layer. **(CO1) (L4)**
3. Explain about HDLC. **(CO2) (L2)**
4. What is meant by channel allocation problem? Explain. **(CO2) (L1)**
5. What is Congestion control? How it is addressed by the Network layer? **(CO3) (L3)**
6. Write a short note on IPV4 Header. **(CO3) (L2)**
7. Give a brief account on Simple Transport Protocol. **(CO4) (L2)**
8. Elucidate World Wide Web. **(CO5) (L2)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Describe ISO-OSI Reference Model in detail with a neat sketch. **(CO1) (L4)**

(Or)

(b) Compare and contrast different types of guided transmission media in detail. **(CO1) (L5)**

10. (a) What are the different mechanisms used for error correction and error detection? Elaborate. **(CO2) (L4)**

(Or)

(b) Illustrate the mechanism of Sliding Window Protocols. **(CO2) (L2)**

11. (a) Explain about design issues in Network layer. **(CO3) (L4)**

(Or)

(b) Write about any two Routing algorithms in detail. **(CO3) (L4)**

12. (a) Explain about Transmission Control Protocol. **(CO4) (L4)**

(Or)

(b) Discuss the significance of elements in transport layer Protocols. **(CO4) (L5)**

13. (a) What is DNS? Explain. **(CO5) (L4)**

(Or)

(b) Discuss Simple Mail Transfer Protocol (SMTP) in detail. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

Course 11: DATA COMMUNICATION AND COMPUTER NETWORKS LAB

Course Code: CS24403P **No. of Hours/Week: 2**

Course Objectives:

To provide exposure to Data Communication and its implementation strategies

Course Outcomes:

At the end of the course, the student will be able to

CO1: Identify different types of networks.

CO2: Simulate Routing and establish networks.

List of Experiments:

1. Understanding various network tools in Windows and Linux
2. Study different types of Network devices and Cables
3. Building a Local Area Network
4. Concept of Network IP Address
5. Introduction to Network Simulator – Packet Tracer (PT)
6. Configuration of a Router using Packet Tracer
7. Implementation of a Network using Packet Tracer
8. Implementation of Static Routing using Packet Tracer
9. Implementation of RIP using Packet Tracer
10. Implementation of OSPF using Packet Tracer
11. Implement DNS using packet tracer
12. Implementation of a VLAN using Packet Tracer

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

SKILL COURSE
CYBER SECURITY
(Common to B.Sc./B.A./B.Com.)

Course Code: CBS24401-SC **No.of Hours/ Week: 2**

Course Objective:
To understand and identify various Cyber Threats and implement certain measures to overcome them.

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

CO1: Develop an understanding of cybercrimes and various legal perspectives involved.
CO2: Develop a security model to handle mobile, wireless devices and related security issues of an organization.
CO3: Use the cybercrime tools and methods in solving real world problems

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	2	3	2	2	2	2	2
CO2	3	2	2	2	3	1	3	1	2	2
CO3	3	2	1	2	2	2	3	2	3	2
Average	3	2	1.6	2	2.6	1.6	2.6	1.6	2.3	2

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT - I:
Introduction to Cybercrime: Introduction, Cybercrime: Definition and origins of the word, Cybercrime and Information Security, who are cyber criminals? classifications of cybercrimes, cybercrime: the legal perspectives, an Indian perspective, cybercrime and the Indian IT Act 2000, a Global perspective on Cybercrimes.

UNIT-II:
Cybercrime-Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless ComputingEra, Authentication Service Security, Attacks on Mobile/Cell Phones.
Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile Devices-Related Security Issues, Organizational Security Policies and Measures in Mobile Computing Era, Laptops.

UNIT-III:
Tools and Methods Used in Cybercrime: Password Cracking, key loggers and Spywares, virus and worms, Trojan Horses and Backdoors, Steganography, attacks on wireless networks, Phishing and Identity Theft: Introduction, Phishing, Identity Theft (ID Theft).

Text Books:

1. Mark Rhodes, Ousley, Information Security, 1st Edition ,MGH, 2013.

Reference Books:

1. Nina Godbole and SunitBelpure ¯ Cyber Security Understanding Cyber Crimes,Computer Forensics and Legal Perspectives , 1st Edition Publication Wiley, 2011.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR - IV SEMESTER

Skill Course: CYBER SECURITY

(Common to B.Sc./B.A./B.Com.)

BLUE PRINT

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Introduction to Cybercrime**	2	2	24
2	**Unit – II** **Cybercrime-Mobile and Wireless Devices** **Mobile Devices**	2	2	24
3	**Unit – III** **Tools and Methods Used in Cybercrime**	2	2	24
Total Marks				**72**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR - IV SEMESTER

MODEL QUESTION PAPER

Skill Course: CYBER SECURITY

(Common to B.Sc./B.A./B.Com.)

Time : 2hrs **Course Code: CBS23401-SC** **Max Marks : 40**

SECTION-A

I. Answer any FOUR of the following questions. **4 X 4=16**

1. Who can be called as cyber criminals? **(CO1) (L1)**
2. Give a short note on Indian IT Act 2000. **(CO1) (L1)**
3. Write about wireless devices. **(CO2) (L2)**
4. What are the security implications? **(CO2) (21)**
5. Define Spyware. **(CO3) (L1)**
6. Describe the features of Trojan Horses. **(CO3) (L2)**

SECTION-B

II. Answer the following questions. **3 X 8=24**

7. (a) Explain about cybercrime and information security. **(CO1) (L4)**

(or)

(b) What is cybercrime? Explain important sections of Indian IT ACT 2000? **(CO1) (L2)**

8. (a) Explain about credit card frauds in wireless computing Era. **(CO2) (L4)**

(or)

(b) What are the Organizational Security Policies in Laptops? Explain. **(CO2) (L5)**

9. (a) What are the various malwares used in cybercrime? Explain. **(CO3) (L4)**

(or)

(b) Compare and contrast various cyber-attack on wireless networks. **(CO3) (L5)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 12: WEB INTERFACE DESIGNING TECHNOLOGIES

Course Code: CS23501 **No. of Hours/Week: 3**

Course Objective:

To provide knowledge about Web architecture and services and inculcate the competency of building a Website.

Course Outcomes:

At the end of the course the student will be able to

CO1: Understand the fundamentals of HTML, including its structure, elements, attributes, and responsive design techniques for creating forms.

CO2: Integrate CSS for styling and layout customization for the HTML pages created.

CO3: Implement client-side validation and dynamic web features using JavaScript and DHTML for enhanced user interaction.

CO4: Apply JavaScript to manipulate HTML elements, validate data, handle events, manage browser components, and create dynamic, interactive, and user-responsive web pages.

CO5: Learn how to install word press and gain the knowledge of installing various plugins to use in their websites.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	-	-	1	3	3	2	2
CO2	3	3	2	-	-	1	3	3	3	3
CO3	2	3	3	-	-	2	3	2	2	3
CO4	3	2	2	1	1	2	2	3	3	2
CO5	2	3	2	1	2	3	3	2	2	2
Average	2.6	2.6	2	0.4	0.6	1.8	2.8	2.6	2.4	2.4

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT - I

HTML: Introduction to web designing, difference between web applications and desktop applications, introduction to HTML, HTML structure, elements, attributes, headings, paragraphs, images, tables, lists, blocks, symbols, embedding multi-media components in HTML, HTML forms

UNIT – II

CSS: CSS home, introduction, syntax, CSS combinators, colors, background, borders, margins, padding, height/width, text, fonts, tables, lists, position, overflow, float, pseudo class, pseudo elements, opacity, tool tips, image gallery, CSS forms, CSS counters.

UNIT – III

Java Script: What is DHTML, JavaScript, basics, variables, operators, statements, string manipulations, mathematical functions, arrays, functions. objects, regular expressions, exception handling.

UNIT-IV

Client-Side Scripting: Accessing HTML form elements using Java Script object model, basic data validations, data format validations, generating responsive messages, opening windows using java script, different kinds of dialog boxes, accessing status bar using java script, embedding basic animative features using different keyboard and mouse events.

UNIT – V

Word press: Introduction to word press, features, and advantages, installing and configuring word press and understanding its admin panel (demonstration only), working with posts, managing pages, working with media - Adding, editing, deleting media elements, working with widgets, using menus, working with themes, defining users, roles and profiles, adding external links, extending word press with plug-ins.

Additional Inputs: Working with themes-using featured images, configuring settings, customizing the site

Text Book(s)

1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley (2007)
2. Paul S.WangSanda S. Katila, an Introduction to Web Design plus Programming, Thomson (2007).

Reference Books

1. Head First HTML and CSS, Elisabeth Robson, Eric Freeman, O'Reilly Media Inc.
2. An Introduction to HTML and JavaScript: for Scientists and Engineers, David R. Brooks. Springer, 2007
3. Schaum's Easy Outline HTML, David Mercer, Mcgraw Hill Professional.
4. Word press for Beginners, Dr.Andy Williams.
5. Professional word press, Brad Williams, David damstra, Hanstern.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 12: WEB INTERFACE DESIGNING TECHNOLOGIES

Course Code: CS23501 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I HTML**	**2**	**2**	**24**
2.	**Unit – II CSS**	**2**	**2**	**24**
3.	**Unit – III Java Script**	**2**	**1**	**20**
4.	**Unit – IV Client side Validation**	**2**	**1**	**20**
5.	**Unit – V Word press**	**2**	**2**	**24**
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER
Course 12: WEB INTERFACE DESIGNING TECHNOLOGIES

Course Code: CS23501 **No. of Hours/Week: 3**

Time : 3hrs **Max Marks : 60**

SECTION-A

Answer any FIVE of the following questions. 5 X 4=20

1. What is the basic structure of an HTML document? Explain. (CO1)(L1)
2. Discuss briefly about types of lists. (CO1)(L2)
3. What are the advantages of using CSS? (CO2) (L1)
4. Distinguish between the pseudo-class and a pseudo-element. (CO2)(L4)
5. Write about functions in Javascript. (CO3)(L1)
6. What is the purpose of data validation? (CO4)(L2)
7. Give a brief account on the features of Wordpress. (CO5)(L4)
8. What is a WordPress plugin? Give one example. (CO5)(L1)

SECTION-B

Answer the following questions. 5 X 8=40

9. (a) Discuss about Text Formatting Tags in HTML. (CO1)(L4)

(Or)

(b) What are the elements of table tag? How to create a table in HTML? Explain. (CO1)(L4)

10. (a) Discuss the importance of CSS combinators and pseudo-classes with examples. (CO2) (L4)

(Or)

(b) Explain different types of Cascading Style sheets with examples. (CO2)(L2)

11. (a) Describe the different types of operators in JavaScript with examples. (CO3)(L3)

(Or)

(b) Explain JavaScript exception handling with suitable examples. (CO3) (L4)

12. (a) How can you access and manipulate HTML form elements using the JavaScript Object Model? Explain. (CO4) (L4)

(Or)

(b) What are JavaScript events? Illustrate mouse and keyboard events with examples. (CO4) (L4)

13. (a) Describe the steps involved in installing and configuring WordPress for a new website. (CO5) (L4)

(Or)

(b) What are WordPress Themes? Discuss various user roles and permissions in WordPress. (CO5)(L5)

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR SEMESTER-V

Course 12: WEB INTERFACE DESIGING TECHNOLOGIES

Course Code: CS23501P **No. of Hours/Week: 2**

Course Objective:

To inculcate knowledge on web architecture, web services, client side and server side scripting technologies and to provide skills to design interactive and dynamic web sites.

Course Outcomes:

At the end of the course the student will be able to

1. Create a basic website with the help of HTML and CSS.
2. Acquire the skill of installing word press and various plugins of Word press.
3. Create a static website with the help of Word press.
4. Create an interface for a dynamic website.
5. Apply various themes for their websites using Word press.

List of Experiments:

1. Create an HTML document with the following formatting options:
   (a) Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e) Font (Type, Size and Color), (f) Background (Colored background/Image in background), (g) Paragraph, (h) Line Break, (i) Horizontal Rule, (j) Pre tag
2. Create an HTML document which consists of:
   (a) Ordered List (b) Unordered List (c) Nested List (d) Image
3. Create a Table with four rows and five columns. Place an image in one column.
4. Using "table" tag, align the images as follows:

5. Create a menu form using html.
6. Style the menu buttons using CSS.
7. Create a form using HTML which has the following types of controls:
   (a) Text Box (b) Option/radio buttons (c) Check boxes (d) Reset and Submit buttons
8. Embed a calendar object in your web page.
9. Create a form that accepts the information from the subscriber of a mailing system.

Word press:

10. Installation and configuration of word press
11. Access admin panel and manage posts
12. Access admin panel and manage pages
13. Add widgets and menus
14. Create users and assign roles
15. Create a site and add a theme to it

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 13: WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL

Course Code: CS23502 **No. of Hours/Week: 3**

Course Objectives

To provide knowledge about development of Web Applications through Open-source tools

Course Outcomes

At the end of the course the student will be able to

CO1: Understand PHP syntax, including variables, data types, operators, and write simple programs in PHP.

CO2: Create and manipulate arrays and objects in PHP.

CO3: Develop web forms in PHP, manage form input, and perform file and directory operations in PHP, including file inclusion, reading, writing, and executing system commands

CO4: Implement cookies, and utilize session management for user state persistence.

CO5: Connect PHP with MySQL to manage data, and develop applications.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	-	-	1	3	3	3	3
CO2	2	3	3	-	-	2	3	2	2	3
CO3	3	3	3	1	2	1	3	3	2	3
CO4	3	2	2	2	2	1	3	2	3	3
CO5	2	3	3	1	1	2	3	2	3	3
Average	2.6	2.8	2.6	1.33	1.67	1.4	3	2.4	2.6	3

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

The building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. **Flow Control Functions in PHP**: Switching Flow, Loops, Code Blocks and Browser Output.**Working with Functions:** Creating functions, Calling functions, Returning the values from User- Defined Functions, Variable Scope, Saving state between Function calls with the static statement,arguments of functions

UNIT-II

Working with Arrays: Creating Arrays, Some Array-Related Functions.

Working with Objects: Creating Objects, Accessing Object Instances, **Working with Strings**, **Dates and Time:** Formatting strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

UNIT-III

Working with Forms: Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirectingthe user, Sending Mail on Form Submission, and **Working with File Uploads**, Managing files onserver, **Exception handling.**

UNIT-IV

Working with Cookies and User Sessions: Introducing Cookies, setting a Cookie with PHP, Session Function Overview, starting a Session, working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users.

UNIT-V

Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, connecting to MySQL with PHP, Working with MySQL Data. Planning and Creating Database Tables, Creating Menu, Creating Record Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism.

Additional Inputs: Working with Images: Understanding the Image-Creation Process, Necessary Modifications to PHP, Drawing a New Image

Text Book(s)

1. Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson Education (2007).
2. Steven Holzner , PHP: The Complete Reference, McGraw-Hill

Reference Books

1. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition O'reilly, 2014
2. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – III YEAR V SEMESTER

WEB APPLICATIONS DEVELOPMENT USING PHP& MYSQL

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I The Building blocks of PHP**	**2**	**2**	**24**
2.	**Unit – II Working with Arrays**	**2**	**2**	**24**
3.	**Unit – III Working with Forms**	**2**	**2**	**24**
4.	**Unit – IV Working with Files and Directories**	**2**	**1**	**20**
5.	**Unit – V Interacting with MySQL using PHP**	**2**	**1**	**20**
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

MODEL QUESTION PAPER

III B.Sc. - V SEMESTER

Course-13- WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL

Time : 3hrs **Course Code: CS23502** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 x 4=20**

1. What is a variable? How to declare a variable in PHP? **(CO1) (L1)**
2. Differentiate between while and do-while. **(CO1) (L4)**
3. Give a brief account on Date and Time functions. **(CO2) (L2)**
4. Write about formatting strings in PHP. **(CO2) (L2)**
5. Interpret the steps involved in Form submission. **(CO3) (L5)**
6. Explain about Exceptional Handling. **(CO3) (L4)**
7. Write about Session Variables. **(CO4) (L4)**
8. Write about MySQLi Functions. **(CO5) (L2)**

SECTION-B

II. Answer the following questions. **5 x 8=40**

9. (a) List the data types in PHP. Explain. **(CO1) (L2)**

(Or)

(b) Elaborate on the operators used in PHP. **(CO1) (L2)**

10. (a) What is an Array? Explain initialization of arrays with examples. **(CO2) (L3)**

(Or)

(b) Describe the process of creation of Objects in PHP. **(CO2) (L4)**

11. (a) Elucidate the process of creating forms in PHP. **(CO3) (L4)**

(Or)

(b) Explain about sending mail on Form submission. **(CO3) (L2)**

12. (a) Discuss about Working with Cookies in PHP. **(CO4) (L5)**

(Or)

(b) Write about Session Creation, Destroying and Unsetting in PHP. **(CO4) (L5)**

13. (a) Explain about connecting to MySQL with PHP. **(CO5) (L3)**

(Or)

(b) Explain about Record Addition and Record Deletion mechanisms. **(CO2) (L4)**

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DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 13: WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL

Course Code: CS23502 **No. of Hours/Week: 2**

Course Objective:

To inculcate knowledge on web applications using PHP and MYSQL Lab.

Course Outcomes:

At the end of the course the student will be able to

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

List of Experiments

1. Write a PHP program to Display "Hello"
2. Write a PHP Program to display the today's date.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
6. Create student registration form using text box, check box, radio button, select, submit button.And display user inserted value in new PHP page.
7. Create Website Registration Form using text box, check box, radio button, select, submitbutton. And display user inserted value in new PHP page.
8. Write PHP script to demonstrate passing variables with cookies.
9. Write a PHP script to connect MySQL server from your website.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to perform CRUD (Create, Read, Update and Delete) operations on a database table.
12. Create a web site using any open-source framework built on PHP and MySQL – It is a team activity wherein students are divided into multiple groups and each group comes up with theirown website with basic features.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 14A: INTERNET OF THINGS

Course Code: **No. of Hours/Week: 3**

Course Objectives

To provide knowledge on IoT, its concepts, architecture and create IoT solutions to real world problems using IoT

Course Outcome

CO1: Understand various concepts, terminologies and applications of IoT
CO2: Learn how to use various sensors and actuators for design of IoT.
CO3: Understand various Wireless protocols for IoT
CO4: Learn how to use various sensors and actuators & develop IoT solutions using Arduino
CO5: Develop and Connect IoT with Cloud Platforms.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	-	-	-	-	-	2	1	1	2
CO2	3	3	2	-	-	2	2	2	2	3
CO3	3	3	3	-	2	2	3	3	3	3
CO4	3	2	1	-	-	2	2	2	2	3
CO5	3	3	2	-	2	2	3	3	3	3
Average	2.8	2.2	1.6	-	0.8	1.6	2.4	2.6	2.2	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT - I

Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Architectures, Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, About Things in IoT, The Identifiers in IoT, About the Internet in IoT, IoT frameworks, IoT and M2M.

Applications of IoT: Home Automation, Smart Cities, Energy, Retail Management, Logistics, Agriculture, Health and Lifestyle, Industrial IoT, Legal challenges, IoT design Ethics, IoT in Environmental Protection.

UNIT - II

Sensors Networks : Definition, Types of Sensors, Types of Actuators, Examples and Working, IoT Development Boards: Arduino IDE and Board Types, RaspberriPi Development Kit, RFID Principles and components, Wireless Sensor Networks: History and Context, The node, Connecting nodes, Networking Nodes, WSN and IoT.

UNIT - III

Wireless Technologies for IoT: WPAN Technologies for IoT: IEEE 802.15.4, Zigbee, HART, NFC, Z-Wave, BLE, Bacnet and Modbus.

IP Based Protocols for IoT: IPv6, 6LowPAN, LoRA, RPL, REST, AMPQ, CoAP, MQTT. Edge connectivity and protocols.

UNIT - IV

Arduino Simulation Environment: Arduino Uno Architecture, Setting up the IDE, Writing Arduino Software, Arduino Libraries, Basics of Embedded C programming for Arduino, Interfacing LED, push button and buzzer with Arduino, Interfacing Arduino with LCD.

Sensor & Actuators with Arduino: Overview of Sensors working, Analog and Digital Sensors, Interfacing of Temperature, Humidity, Motion, Light and Gas Sensors with Arduino, Interfacing of Actuators with Arduino, Interfacing of Relay Switch and Servo Motor with Arduino.

UNIT - V

Developing IOT's: Implementation of IoT with Arduino, Connecting and using various IoT Cloud Based Platforms such as Blynk, Thingspeak, AWS IoT, Google Cloud IoT Core etc. Cloud Computing, Fog Computing, Privacy and Security Issues in IoT.

Text Book(s)

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Sudip Mishra, Anandarup Mukherjee, Arijit Roy: Introduction to IOT, Cambridge University Press.
3. Internet of Things- Dr Surya Durbha & Dr Jyoti Joglekar, Oxford University Press

Reference Books

1. Daniel Minoli, ― "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118-47347-4, Willy Publications
2. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

INTERNET OF THINGS
(B.Sc. Computer Science Major)

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I Fundamentals of IoT**	2	2	24
2	**Unit – II Sensors Networks**	2	2	24
3	**Unit – III Wireless Technologies for IoT**	2	2	24
4	**Unit – IV Arduino Simulation Environment**	2	1	20
5	**Unit – V Developing IOT's**	2	1	20
			Total Marks	**112**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. III YEAR V SEMESTER

MODEL QUESTION PAPER

INTERNET OF THINGS

(B.Sc. Computer Science Major)

Time : 3hrs **Max Marks : 60**

SECTION-A

Answer any FIVE of the following questions. **5 x 4 = 20**

1. Define IoT and mention its key characteristics. (CO1) (L1)
2. What are the legal and ethical challenges associated with IoT design? (CO1) (L3)
3. What are actuators? Provide two examples. (CO2) (L1)
4. List and explain any five types of sensors commonly used in IoT. (CO2) (L2)
5. Write a short note on LoRa technology. (CO3) (L1)
6. Write the significance of interfacing push buttons and buzzers with Arduino. (CO4) (L2)
7. List any two IoT cloud-based platforms and explain. (CO5) (L2)
8. Mention privacy issues and security issues faced in IoT systems. (CO5) (L3)

SECTION – B

Answer the following questions. **5 x 8 = 40**

9. (a) Explain the architecture of IoT in detail, including physical and logical design aspects. (CO1) (L4)

(or)

(b) Discuss various enabling technologies of IoT and their significance in the development of smart applications. (CO1) (L4)

10. (a) Describe the working of various sensors and actuators used in IoT with suitable examples. (CO2) (L4)

(or)

(b) Compare and contrast Arduino and Raspberry Pi development boards. (CO2) (L3)

11. (a) Discuss WPAN technologies like IEEE 802.15.4 and Zigbee and their relevance to IoT. (CO3) (L4)

(or)

(b) Explain the importance of MQTT and CoAP IP-based protocols in IoT. (CO3) (L4)

12. (a) Explain the architecture of Arduino Uno and how to set up the Arduino IDE. (CO4) (L4)

(or)

(b) Describe the steps to interface temperature, humidity, and motion sensors with Arduino. (CO4) (L4)

13. (a) Discuss the process of connecting Arduino-based IoT projects to cloud platforms like Blynk and Thingspeak. (CO5) (L4)

(or)

(b) Explain cloud computing and fog computing and their significance in IoT development. (CO5) (L4)

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 14A: INTERNET OF THINGS

Course Code: **No. of Hours/Week: 2**

Course Objectives

To inculcate knowledge on using Arduino and IoT devices.

Course Outcome

At the end of the course the student will be able to

1. Acquire the skills to design a small IoT device.
2. Connect various sensors, actuators, etc to Arduino board.
3. Connect the things to Internet
4. Design a small mobile app to control the sensors.
5. Deploy a simple IoT device

List of Experiments

1. Understanding Arduino UNO Board and Components
2. Installing and work with Arduino IDE
3. Blinking LED sketch with Arduino
4. Simulation of 4-Way Traffic Light with Arduino
5. Using Pulse Width Modulation
6. LED Fade Sketch and Button Sketch
7. Analog Input Sketch (Bar Graph with LEDs and Potentiometre)
8. Digital Read Serial Sketch (Working with DHT/IR/Gas or Any other Sensor)
9. Working with Adafruit Libraries in Arduino
10. Spinning a DC Motor and Motor Speed Control Sketch
11. Working with Shields
12. Design APP using Blink App or Things peak API and connect it LED bulb.
13. Design APP Using Blynk App and Connect to Temperature, magnetic Sensors.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 14 B: FOUNDATIONS OF DATA SCIENCE

Course Code: CS23503 **No. of Hours/Week: 3**

Course Objectives

To develop knowledge on various concepts in Data Science

Course Outcome

Students after successful completion of the course will be able to:

CO1: Identify the need for data science and understand various data collection strategies
CO2: Understand about NoSQL and Descriptive Statistics
CO3: Apply Numpy methods to process the data in an array.
CO4: Summarize and Compute Descriptive Statistics using Pandas.
CO5: Apply powerful data manipulations visualization using Pandas

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	2	2	2	3	3	2	2
CO2	3	3	2	1	1	2	3	3	3	3
CO3	2	3	3	-	-	1	3	2	2	3
CO4	3	2	2	1	1	1	2	3	3	2
CO5	2	3	2	1	2	3	3	3	3	3
Average	2.6	2.6	2	1.25	1.5	1.8	2.8	2.8	2.6	2.6

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Introduction to Data Science: Need for Data Science – What is Data Science - Evolution of Data Science, Data Science Process – Business Intelligence and Data Science – Prerequisites for a Data Scientist – Tools and Skills required. Applications of Data Science in various fields – Data Security Issues.

Data Collection Strategies, Data Pre-Processing Overview, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization, Data Munging, Filtering

UNIT-II

Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis; Box Plots – Pivot Table – Heat Map – Correlation Statistics –ANOVA.

No-SQL: Document Databases, Wide-column Databases and Graphical Databases.

UNIT-III

Python for Data Science –Python Libraries, Python integrated Development Environments (IDE)for Data Science, **NumPy Basics:** Arrays and Vectorized Computation- The NumPy ndarray- Creating ndarrays- Data Types for ndarrays- Arithmetic with NumPy Arrays- Basic Indexing and Slicing - Boolean Indexing-Transposing Arrays and Swapping Axes.

Universal Functions: Fast Element-Wise Array Functions- Mathematical and Statistical Methods- Sorting- Unique and Other Set Logic.

UNIT-IV

Introduction to pandas Data Structures: Series, Data Frame and Essential Functionality: Dropping Entries- Indexing, Selection, and Filtering- Function Application and Mapping- Sortingand Ranking.

Summarizing and Computing Descriptive Statistics- Unique Values, Value Counts, and Membership. Reading and Writing Data in Text Format.

UNIT-V

Data Cleaning and Preparation: Handling Missing Data - Data Transformation: Removing Duplicates, Transforming Data Using a Function or Mapping, Replacing Values, Detecting and Filtering Outliers-

Plotting with pandas: Line Plots, Bar Plots, Histograms and Density Plots, Scatter or Point Plots.

Text Book(s)

1. Y. Daniel Liang, "Introduction to Programming using Python", Pearson, 2012.
2. Wes McKinney, "Python for Data Analysis: Data Wrangling with Pandas, NumPy,and IPython", O'Reilly, 2nd Edition, 2018.

Reference Books

1. Sanjeev Wagh, Manisha Bhende, Anuradha Thakare, 'Fundamentals of Data Science, CRC Press, 1st Edition, 2022
2. Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working with Data", O'Reilly, 2017.

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B.Sc. III YEAR V SEMESTER

Course 14 B: FOUNDATIONS OF DATA SCIENCE
Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I Introduction to data Science, Data Collections**	2	2	24
2	**Unit – II Descriptive Statistics, No-SQL**	2	1	20
3	**Unit – III** Python for data Science, Universal Functions	2	2	24
4	**Unit – IV Introductions to pandas Data Structures**	2	1	20
5	**Unit – V** Data cleaning and Plotting with pandas	2	2	24
			Total Marks	**112**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. III YEAR V SEMESTER

Model Question Paper

Course 14 B: FOUNDATIONS OF DATA SCIENCE

Time: 3hrs **Course Code: CS23503** **Max Marks : 60**

SECTION-A

Answer any FIVE of the following questions. **5 x 4 = 20**

1. Distinguish between Data Science and Business Intelligence. (CO1) (L3)
2. List and explain applications of Data Science. (CO1) (L1)
3. Compare and contrast different No-SQL databases. (CO1) (L2)
4. What is correlation in data analysis? Explain. (CO2) (L1)
5. Give a brief account on applications of Numpy. (CO3) (L1)
6. List the functions used for summarizing data in pandas. Explain. (CO4) (L2)
7. Name two methods to handle missing data in pandas. Explain. (CO5) (L2)
8. How are outliers detected and filtered? Explain with an example. (CO5) (L1)

SECTION-B

Answer the following questions. **5 x 8 = 40**

9. (a) Elucidate evolution and phases of Data Science process in detail. (CO1) (L4)

   (OR)

   (b) Explain the various steps involved in Data pre-processing. (CO1) (L4)

10. (a) Explain mean, standard deviation, skewness, and kurtosis with examples. (CO2) (L4)

    (OR)

    (b) Discuss No-SQL databases and differentiate between document, wide-column, and graph databases.
    (CO2) (L5)

11. (a) List key Python libraries and IDEs for Data Science and their uses. (CO3) (L4)

    (OR)

    (b) Explain creating and manipulating NumPy arrays with examples. (CO3) (L4)

12. (a) Explain Series and DataFrames in pandas with examples. (CO4) (L4)

    (OR)

    (b) Describe reindexing, indexing, selection and filtering in pandas with illustrations. (CO4) (L4)

13. (a) Discuss techniques for handling missing data in pandas with illustrations. (CO5) (L4)

    (OR)

    (b) Explain pandas visualization using line plots, bar plots, histograms, and scatter plots. (CO5) (L4)

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 14 B: FOUNDATIONS OF DATA SCIENCE

Course Code: CS23503P **No. of Hours/Week: 2**

Course Objectives:

To enable students to effectively use Python IDEs, perform data analysis using NumPy and pandas, handle real-world datasets, perform data cleaning, transformation, visualization, and develop practical skills for data science applications.

Course Outcomes

CO1: Apply various Python IDEs for implementing data science tasks and create/manipulate NumPy arrays using Python data structures and random functions.
CO2: Perform essential data processing and analysis on datasets using pandas, including data selection, sorting, statistical operations, and visualization.
CO3: Clean, transform, and visualize large datasets using pandas by handling missing data, detecting outliers, applying vectorized operations, and creating effective data plots.

List of Experiments

1. Study on various python IDEs for Data Science
2. Create NumPy arrays from Python Data Structures, Intrinsic NumPy objects and Random Functions.
3. Manipulation of NumPy arrays- Indexing, Slicing, Reshaping, Joining and Splitting.
4. Computation on NumPy arrays using Universal Functions and Mathematical methods.
5. Create Pandas Series and Data Frame from various inputs.
6. Import any CSV file to Pandas Data Frame and perform the following:
    a. Visualize the first and last 10 records
    b. Get the shape, index and column details
    c. Select/Delete the records (rows)/columns based on conditions.
    d. Perform ranking and sorting operations.
    e. Do required statistical operations on the given column
7. Import any CSV file to Pandas Data Frame and perform the following:
    a. Handle missing data by detecting and dropping/ filling missing values.
    b. Transform data using apply () and map() method.
    c. Detect and filter outliers.
    d. Perform Vectorized String operations on Pandas Series.
    e. Visualize data using Line Plots, Bar Plots, Histograms, Density Plots and Scatter Plots.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 15 A: IOT APPLICATIONS DEVELOPMENT AND PROGRAMMING

Course Code: **No. of Hours/Week: 3**

Course Objectives

To enable students to develop IoT solutions for real-world problems

Course Outcomes

Upon successful completion of the course, students will be able to

CO1: Understand the Basic Concepts of Internet of Things
CO2: Learn various Sensors and their associative protocols
CO3: Learn the Single Board Computers for development of IoT
CO4: Build the IoT devices with the Node-RED without Complex coding
CO5: Develop various IoT real-time applications

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	2	2	2	3	3	2	2
CO2	3	3	2	1	1	2	3	3	3	3
CO3	2	3	3	-	-	1	3	2	2	3
CO4	3	2	2	1	1	1	2	3	3	2
CO5	2	3	2	1	2	3	3	3	3	3
Average	2.6	2.6	2	1.25	1.5	1.8	2.8	2.8	2.6	2.6

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Overview of the Internet of Things (IoT) and Sensors: Sensors - Energy-based, Signal Output, Mode of Operation, Electronic Sensors. Connectivity - Bluetooth, Zigbee, Wi-Fi, LoRa, Wired Communication. Machine Intelligence, Active Management, Sensor Fusion, Smart Devices-Human- Computer Interaction, Context Awareness, Actuators, IoT and Smart City Applications-Automobile Sensors, Smart Home Sensors, Smart Transportation Sensors.

UNIT-II

IoT Sensors and Their Interfacing Protocols: Vision and Imaging Sensors- Line Scan Cameras, 3D Depth Cameras, **Sensors That Measure Temperature**-Thermocouples, Resistance Temperature Detector (RTD), Temperature Thermistor Sensors, Semiconductor Temperature Sensors, Radiation Sensors; Proximity Sensors, Pressure Sensors, Position Sensors, Photoelectric Sensors, Particle Sensors, Types of Particle Sensors-Metal Detectors, Level Sensors, Leak Detectors, Humidity Sensors, Gas and Chemical Sensors, Gas Detectors,Carbon Monoxide (MQ7) Detectors, Flame Detectors, **Sensor Communication Protocols**

UNIT-III

Programming Single Board Computers: Arduino Programming, Raspberry Pi-Basic functionality of Raspberry Pi B+ board, setting up the board, configuration and use, Basics of Linux and its use, Introduction to Raspberry Pi GPIO Access, Interfacing DHT, Interfacing Picamto Raspberry Pi zero w, Pi Camera Specifications, Pi Camera Access, Interfacing PIR Sensor **Python:** File Concepts, Spreadsheet Concepts, Communication Concepts, Wired and WirelessProgramming Concepts

UNIT-IV

Node-RED: Node-RED Features, Installation of Node-RED, Node-RED Architecture, Node- RED Flow Editor, Basic Function Nodes, Node-RED Library, Node-RED Applications; MQTT Protocols, Google Sheets Programming (gspread), Firebase Programming, Matplotlib- Getting Started, Bar Graphs, Scatter Plot, Spectrum Representation, Coherence of Two Signals, Cross-Correlation Graph, Autocorreleation Graph, Changing Figure Size in Different Units, Scale Pie Charts, Style Sheets- FiveThirtyEight Style Sheet, Solarized Light Style Sheet.

UNIT-V

Wireless Connectivity in IoT: Introduction, Low-Power Wide-Area Networks (LPWANs),RFID Protocol, XBEE Radios with Arduino, Bluetooth with Arduino, Arduino with a GSMModem, Arduino with Firebase Cloud Connectivity

The Internet of Things through the Raspberry Pi: Introduction, Cluster Computing with Raspberry Pi Zero W-Message Passing Interface (MPI), Networking with RP is for Simple MPI Scripts, Simple MPI Programming

Text Book(s)

1. **Internet of Things Using Single Board Computers**, *G. R. Kanagachidambaresan*, Apress,2022.
2. **Practical Node-RED Programming**, *Taiji Hagino*, Packt Publishing, 2021

Reference Books

1. **Internet of Things Programming Projects: Build modern IoT solutions with the Raspberry Pi 3 and Python,** *Colin Dow***,** Packt Publishing, 2021
2. **Programming the Internet of Things: An Introduction to Building Integrated, Device-to-Cloud IoT Solutions,** *Andy King***,** O'Reilly Media, 2021

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. III YEAR V SEMESTER

Course 15 A: IOT APPLICATIONS DEVELOPMENT AND PROGRAMMING

(B.Sc. Computer Science Major)

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Overview of the Internet of Things (IoT) and Sensors**	2	2	24
2	**Unit – II** **IoT Sensors and Their Interfacing Protocols**	2	2	24
3	**Unit – III** **Programming Single Board Computers**	2	2	24
4	**Unit – IV** **Node-RED**	2	1	20
5	**Unit – V** **Wireless Connectivity in IoT**	2	1	20
			Total Marks	**112**

DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER
MODEL QUESTION PAPER
Course 15 A: IOT APPLICATIONS DEVELOPMENT AND PROGRAMMING
(B.Sc. Computer Science Major)

Time : 3hrs **Max Marks : 60**

SECTION - A

Answer any FIVE of the following questions. **5 x 4 = 20**

1. What is sensor fusion? Briefly explain its importance in IoT.
2. Define context awareness in smart devices and its relevance in IoT.
3. What are vision and imaging sensors? Give two examples.
4. Write a short note on Carbon Monoxide (MQ7) detectors.
5. What is the purpose of Raspberry Pi GPIO access?
6. List any four basic function nodes available in Node-RED.
7. What is the role of Bluetooth in Arduino-based IoT applications?
8. List two features of low-power wide-area networks (LPWANs).

SECTION - B

Answer the following questions. 5 x 8 = 40

9. (a) Explain the different types of sensors used in IoT based on energy, signal output, and mode of operation with examples.

   OR

   (b) Discuss the various connectivity technologies in IoT,

10. (a) Explain the working principles of different temperature sensors.

    OR

    (b) Discuss the types and applications of particle sensors, gas sensors, and chemical sensors in IoT.

11. (a) Explain the basic functionality, setup, and configuration of the Raspberry Pi B+ board.

    OR

    (b) Discuss the interfacing of sensors like DHT and PIR sensors with Raspberry Pi using Python.

12. (a) Explain Node-RED architecture and flow editor, and discuss its applications in IoT.

    OR

    (b) Discuss the features of MQTT protocols and the process of integrating Google Sheets and Firebase with IoT platforms.

13. (a) Discuss LPWANs, RFID, and GSM modem connectivity with Arduino in IoT systems.

    OR

    (b) Describe cluster computing with Raspberry Pi Zero W using Message Passing Interface (MPI) and simple MPI programming.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 15 A: IOT APPLICATIONS DEVELOPMENT AND PROGRAMMING

Course Code: **No. of Hours/Week: 2**

Course Objectives

To develop skills in IoT device control, flow-based programming, cloud integration, and data visualization using Raspberry Pi, Node-RED, MySQL, Arduino, and Firebase.

Course Outcomes

CO1: Control devices and interact with databases using Raspberry Pi and MySQL.
CO2: Design Node-RED flows for sensor data handling and API-based cloud applications.
CO3: Connect Arduino to Firebase and visualize IoT data using dashboards and server-side apps.

List of Experiments:

1. Write a program to switch light on when the input is 1 and switch the light off when the input is 0 using Raspberry pi
2. Install Node-RED and Flow-based Programming Development Environment
3. Create Basic Flows with Major Nodes
4. Develop a Node-Red Flow for various Case Studies
5. Implement Node-RED in the Cloud Calling a Web API from Node-RED
6. Create a To Do Application with Node-RED Handling Sensor Data on the Raspberry Pi
7. Develop a Dashboard with various 2D Graphs with Matplotlib
8. Install MySQL database in Raspberry pi.
9. Write a program to work with basic MySQL queries by fetching data from database in Raspberry pi.
10. Arduino with Firebase Cloud Connectivity
11. Visualize Data by Creating a Server-side Application in the Firebase

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 15 B: APPLICATION DEVELOPMENT USING PYTHON

Course Code: CS23504 **No. of Hours/Week: 3**

Course Objectives

To develop applications using Python

Course Outcomes

After the completion of the course, the students will be able to:

CO1: Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
CO2: Demonstrate proficiency in handling Strings and File Systems.
CO3: Create, run and manipulate Python Programs using core data structures like Lists, x Dictionaries and use Regular Expressions.
CO4: Interpret the concepts of Web Programming and GUI in Python.
CO5: Apply concepts of Python programming in various fields related to IOT, Web Services and Databases in Python

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	1	2	2	1	3	1	2	2
CO2	3	3	2	1	1	2	3	3	3	3
CO3	2	2	3	1	1	1	3	2	2	3
CO4	3	2	2	1	1	1	2	3	3	2
CO5	2	3	2	1	2	3	3	3	3	3
Average	2.4	2.4	2	1.2	1.4	1.6	2.8	2.4	2.6	2.6

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Python basics, Objects- Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types

Numbers - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions, Related Modules

Sequences - Strings, Lists, and Tuples, Dictionaries and Set Types

Control Flow, Truthiness, Sorting, List Comprehensions, Generators and Iterators

UNIT-II

Files: File Objects, File Built-in Function [open()], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution

Exceptions: Exceptions in Python, Detecting and Handling Exceptions, Context Management, Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related Modules

Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules

UNIT-III

Regular Expressions: Introduction, Special Symbols and Characters, Res and Python

Multithreaded Programming: Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules

UNIT-IV

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs

Web Programming: Introduction, Wed Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application, Advanced CGI, Web (HTTP) Servers

UNIT-V

Database Programming: Introduction, Python Database Application Programmer's Interface (DBAPI), Object Relational Managers (ORMs), Related Modules

Text Book(s)

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.
2. Think Python, Allen Downey, Green Tea Press.

Reference Books

1. Introduction to Python, Kenneth A. Lambert, Cengage.
2. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.
3. Learning Python, Mark Lutz, O' Really.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 15 B: APPLICATION DEVELOPMENT USING PYTHON
(B.Sc. Computer Science Major)

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Python basics, Objects**	2	2	24
2	**Unit – II** **Files, Exceptions and Modules**	2	2	24
3	**Unit – III** **Regular Expressions**	2	2	24
4	**Unit – IV** **GUI and Web Programming**	2	1	20
5	**Unit – V** **Database Programming**	2	1	20
			Total Marks	**112**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR IV SEMESTER

MODEL QUESTION PAPER

Course 15 B: APPLICATION DEVELOPMENT USING PYTHON

(B.Sc. Computer Science Major)

Time : 3hrs **Course Code: CS23504** **Max Marks : 60**

SECTION-A

Answer any FIVE of the following questions. **5 x 4 = 20**

1. List Python standard data types with examples. (CO1) (L1)
2. Give a short account on Generators and Iterators in Python. (CO1) (L1)
3. Explain the methods used for working with csv files in Python. (CO2) (L2)
4. What is the purpose of 'raise' in Python exceptions? (CO2) (L2)
5. Give a short note on Meta characters used in Regular Expressions. (CO3) (L3)
6. Write about any four Tkinter Widgets. (CO4) (L1)
7. Explain about Thread Life Cycle. (CO3) (L2)
8. Give a brief account on connection objects. (CO5) (L1)

SECTION-B

Answer the following questions. 5 x 8 = 40

9. (a) Explain different Control statements in Python with examples. (CO1) (L4)
   (OR)
   (b) Discuss List, Tuples and Dictionaries and illustrate them with various methods.(CO1) (L4)

10. (a) Explain file handling in Python using various file handling methods. (CO2) (L4)
    (OR)
    (b) Discuss exception handling in Python using try-except blocks. (CO2) (L4)

11. (a) Describe the use of the `threading` module in Python for multithreaded programming. (CO3) (L4)
    (OR)
    (b) Explain the key symbols and patterns used in Python regular expressions. (CO3) (L3)

12. (a) Describe the role of Tkinter in creating GUI applications in Python. (CO4) (L4)
    (OR)
    (b) Describe Explain how to create a simple web client using Python. (CO4) (L4)

13. (a) Explain Python Database API (DBAPI) with basic database operations. (CO5) (L4)
    (OR)
    (b) Discuss the concept and advantages of using Object Relational Managers (ORMs). (CO5) (L5)

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. III YEAR V SEMESTER

Course 15 B: APPLICATION DEVELOPMENT USING PYTHON

Course Code: CS23504P **No. of Hours/Week: 2**

Course Objective:

To develop various applications using Python

Course Outcomes:

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

1. Implement simple programs in Python
2. Implement programs related to various data structures like lists, dictionaries, etc.
3. Implement programs related to files. 16
4. Implement applications related to databases, Web services and IOT.

List of Experiments:

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsiusand vice versa depending upon user's choice.
2. Write a python program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades accordingto the following criteria :

   Grade A: Percentage >=80 Grade B: Percentage>=70 and 80

   Grade C: Percentage>=60 and <70 Grade D: Percentage>=40 and <60 Grade E: Percentage<40

3. Demonstrate various methods of Sequence Data Types
4. Write a python program to display the first n terms of Fibonacci series.
5. Write a python program to calculate the sum and product of two compatible matrices.
6. Write a function that takes a character and returns True if it is a vowel and False otherwise.
7. Write a program to implement exception handling.
8. Write a program to implement Multithreading
9. Develop a Python GUI calculator using Tkinter
10. Write a Python program to read last 5 lines of a file.
11. Design a simple database application that stores the records and retrieve the same
12. Design a database application to search the specified record from the database.
13. Design a database application to that allows the user to add, delete and modify the records.

DEPARTMENT OF COMPUTER SCIENCE

MINOR SYLLABUS

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA

B.Sc. (Computer Science) – Minor Syllabus

Course Structure

Semester	Paper	Subject	Hrs./Week	Credits	CIA	EX	Total
SEM - III	2	Object Oriented Programming using Java	3	3	40	60	100
		Object Oriented Programming using Java Lab	2	1	-	50	50
SEM - IV	3	Database Management System	3	3	40	60	100
		Database Management System Lab	2	1	-	50	50
	4	Object Oriented Software Engineering	3	3	40	60	100
		Object Oriented Software Engineering Lab	2	1	-	50	50
SEM - V	5	Web Interface Designing Technologies	3	3	40	60	100
		Web Interface Designing Technologies Lab	2	1	-	50	50
	6	Web Applications Development using PHP& MYSQL	3	3	40	60	100
		Web Applications Development using PHP& MYSQL Lab	2	1	-	50	50

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 5: OBJECT ORIENTED PROGRAMMING USING JAVA
(B.Sc. Computer Science Minor)

Course Code: M-CS24301 **No. of Hours/Week: 3**

Course Objective:

To introduce the fundamental concepts of Object-Oriented programming and to design &implement object-oriented programming concepts in Java.

Course Outcomes:

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

CO1: Understand the basic concepts of Object-Oriented Programming and Java Program Constructs
CO2: Implement classes and objects and analyze Inheritance and Dynamic Method Dispatch
CO3: Create packages and implement interfaces, exception handling to enhance program reliability
CO4: Develop multithreaded applications and utilize stream-based I/O for file handling in Java
CO5: Construct GUI screens with event handling.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	3	2	2	3
CO2	3	3	3	2	1	1	3	3	2	3
CO3	3	2	3	2	-	2	3	3	2	3
CO4	3	3	3	1	1	1	3	3	3	3
CO5	2	2	2	1	1	2	3	2	3	3
Average	2.8	2.4	2.6	1.4	0.6	1.4	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

OOPs Concepts and Java Programming: Introduction to Object-Oriented concepts, procedural and object-oriented programming paradigm

Java programming: An Overview of Java, Java Environment, Data types, Variables, constants,scope and life time of variables, operators, type conversion and casting, Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format(), Control Statements

UNIT-II

Arrays, Command Line Arguments, Strings-String Class Methods

Classes & Objects: Creating Classes, declaring objects, Methods, parameter passing, static fields and methods, Constructors, and 'this' keyword, overloading methods and access

Inheritance: Inheritance hierarchies, super and subclasses, member access rules, 'super' keyword, preventing

inheritance: final classes and methods, the object class and its methods; **Polymorphism**: Dynamic binding, method overriding, abstract classes and methods.

UNIT-III

Interface: Interfaces Vs Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface;
Packages: Defining, creating and accessing a package, understanding CLASSPATH, importing packages.
Exception Handling: Benefits of exception handling, the classification of exceptions, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exception subclasses.

UNIT-IV

Multithreading: Differences between multiple processes and multiple threads, thread states, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.
Stream based I/O (java.io) – The Stream classes-Byte streams and Character streams, Reading console Input and Writing Console Output, File class, Reading and writing Files, The Console class, Serialization.

UNIT-V

GUI Programming with Swing- Introduction, MVC architecture, components, containers. Understanding Layout Managers - Flow Layout, Border Layout, Grid Layout, Card Layout, Grid Bag Layout.

Additional Inputs: constructor overloading, Access specifiers, **Event Handling**- The Delegation event model-Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes, Inner classes, Anonymous Inner classes.

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill.
2. Understanding Object Oriented Programming with Java, updated edition,T. Budd, Pearson Education.

Reference Books

1. Cay S. Horstmann, “Core Java Fundamentals”, Volume 1, 11 th Edition, Prentice Hall,2018.
2. Paul Deitel, Harvey Deitel, “Java SE 8 for programmers”, 3rd Edition, Pearson, 2015.
3. S. Malhotra, S. Chudhary, Programming in Java, 2nd edition, Oxford Univ. Press.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – II Year III Semester

OBJECT ORIENTED PROGRAMMING USING JAVA

(B.Sc. Computer Science Minor)

Course Code: M-CS24301 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Concepts and Java Programming ,** **Java Programming**	2	2	24
2	**Unit – II** **Arrays** **Classes and Objects** **Inheritance**	2	2	24
3	**Unit – III** **Interface** **Packages** **Exception Handling**	2	2	24
4	**Unit – IV** **Multithreading** **Stream based I/O**	2	1	20
5	**Unit – V** **GUI Programming with Swing** **Event Handling**	2	1	20
			Total Marks	112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

MODEL QUESTION PAPER
B.Sc. – II Year III Semester
OBJECT ORIENTED PROGRAMMING USING JAVA
(B.Sc. Computer Science Minor)

Time : 3hrs **Course Code: M-CS24301** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4 = 20**

1. Why do we need to use OOPS concept? **(CO1) (L2)**
2. Write about type conversion and type casting. **(CO1) (L2)**
3. Write about the Arrays in Java. **(CO2) (L1)**
4. Explain the significance of "this" keyword with an example. **(CO2) (L2)**
5. Explain about the Packages in Java. **(CO3) (L2)**
6. List types of Exceptions. Explain any two. **(CO3) (L2)**
7. What is the difference between Process and Thread? **(CO4) (L3)**
8. Write a short notes on Adapter Classes. **(CO5) (L3)**

SECTION-B

II. Answer the following questions. **5 X 8 = 40**

9. (a) Explain Object Oriented Programming Concepts. **(CO1) (L2)**

(or)

(b) Explain about Operators in Java. **(CO1) (L4)**

10. (a) Explain the process of creating a class and object with a simple program. **(CO2) (L3)**

(or)

(b) Explain the various forms of Inheritance with illustration. **(CO2) (L4)**

11. (a) Discuss about Interfaces with example. **(CO3) (L4)**

(or)

(b) Explain about the Exception handling with a simple program. **(CO3 (L4)**

12. (a) Explain about the Life Cycle of Threads. **(CO4) (L4)**

(or)

(b) Explain about FileInputStream and FileOutputStream **(CO4) (L4)**

13. (a) Write about the MVC Architecture Swing in Java. **(CO5) (L2)**

(or)

(b) Elucidate Event Handling in Java with a suitable example. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

OBJECT ORIENTED PROGRAMMING USING JAVA LAB
(B.Sc. Computer Science Minor)

Course Code: M- CS24301P **No. of Hours/Week: 2**

Course Objective:

To introduce various Object-Oriented Concepts through which the students will be enabled to implement classes, inheritance, interface, package and multithreading concepts.

Course Outcomes:

At the end of the course the student will be able to

1. Apply OOP concepts to solve real time problems.
2. Make use of class, inheritance, interface and packages to develop solutions for complex problems.
3. Build java applications using Exception handling and Threads.

List of Experiments

1. Write a Java program to print Fibonacci series using for loop.
2. Write a Java program to calculate multiplication of 2 matrices.
3. Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.
4. Write a Java program that implements method overloading.
5. Write a Java program for sorting a given list of names in ascending order.
6. Write a Java program that displays the number of characters, lines and words in a text file.
7. Write a Java program to implement various types of inheritance
   a. Single ii. Multi-Level iii. Hierarchical iv. Hybrid
8. Write a java program to implement runtime polymorphism.
9. Write a Java program which accepts withdraw amount from the user and throws an exception “In Sufficient Funds” when withdraw amount more than available amount.
10. Write a Java program to create three threads and that displays “good morning”, for every one second, “hello” for every 2 seconds and “welcome” for every 3 seconds by using extending Threadclass.
11. Write a Java program that creates three threads. First thread displays “OOPS”, the second thread displays “Through” and the third thread Displays “JAVA” by using Runnable interface.
12. Implement a Java program for handling mouse events when the mouse entered, exited, clicked, pressed, released, dragged and moved in the client area.
13. Implement a Java program for handling key events when the key board is pressed, released, typed.
14. Write a Java swing program that reads two numbers from two separate text fields and display sum of two numbers in third text field when button “add” is pressed.
15. Write a Java program to design student registration form using Swing Controls. The form which having the following fields and button SAVE
    Form Fields are: Name, RNO, Mail id, Gender, Branch, Address.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

Course 3: DATABASE MANAGEMENT SYSTEMS
(B.Sc. Computer Science Minor)

Course Code: M-CS24401 **No. of Hours/Week: 3**

Course Objectives

To familiarize with concepts of database design

Course Outcomes: On successful completion of the course, students will be able to
CO1: Differentiate between database systems and file based systems
CO2: Design a database using ER model
CO3: Make use of relational model in database design
CO4: Utilize SQL commands for creating and manipulating data stored in databases.
CO5: Write PL/SQL programs to work with databases.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	3	2	2	3
CO2	3	3	3	2	1	1	3	3	2	3
CO3	3	2	3	2	-	2	3	3	2	3
CO4	3	3	3	1	1	1	3	3	3	3
CO5	2	2	2	1	1	2	3	2	3	3
Average	2.8	2.4	2.6	1.4	0.6	1.4	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT- I

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 - II

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 - III

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, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms upto 3rd normal form.

UNIT - IV

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

UNIT - V

PL/SQL: Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements,Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.

Additional Inputs:

Transaction Management and Concurrency Control: What is transaction, ACID Properties, Concurrency Control

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill, 2010.
2. Fundamentals of Relational Database Management Systems by S. Sumathi, S. Esakkirajan, Springer Publications.

Reference Books

1. Database Management Systems by Raghu Ramakrishnan, McGrawhill
2. Principles of Database Systems by J. D. Ullman
3. Fundamentals of Database Systems by R. Elmasri and S. Navathe
4. SQL: The Ultimate Beginners Guide by Steve Tale.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

DATABASE MANAGEMENT SYSTEMS
(B.Sc. Computer Science Minor)

Course Code: M-CS24401 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I Overview of Database Management System**	2	2	24
2	**Unit – II Entity-Relationship Model**	2	2	24
3	**Unit – III Relational Model**	2	2	24
4	**Unit – IV Structured Query Language**	2	1	20
5	**Unit – V PL/SQL**	2	1	20
			Total Marks	112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

MODEL QUESTION PAPER

B.Sc. II YEAR IV SEMESTER

DATABASE MANAGEMENT SYSTEMS

(B.Sc. Computer Science Minor)

Time : 3hrs **Course Code: M-CS24401** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4=20**

1. Discuss briefly the components of DBMS. **(CO1) (L4)**
2. Summarize the drawbacks of File System. **(CO1) (L2)**
3. Elucidate EER. **(CO2) (L2)**
4. Classify Relationships based on entity sets participation. **(CO2) (L2)**
5. Explain about Aggregate Functions. **(CO4) (L2)**
6. Write a short note on CODD rules. **(CO3) (L2)**
7. Give a brief account on Procedures in PL/SQL. **(CO5) (L1)**
8. Explain set operations in Relation Algebra. **(CO4) (L3)**

SECTION-B

II. Answer the following questions. **5 X 8=40**

9. (a) Define DBMS. Explain the advantages of DBMS. **(CO1) (L4)**

   (Or)

   (b) Elucidate Database System Architecture with a neat sketch. **(CO1) (L4)**

10. (a) Interpret the building blocks of an entity relationship diagram with illustration. **(CO2) (L6)**

    (Or)

    (b) Discuss IS A relationship and attribute inheritance. **(CO2) (L5)**

11. (a) Discuss relational algebra, operations and advantages of relational algebra. **(CO3) (L4)**

    (Or)

    (b) Distinguish between INF and 2NF in detail. **(CO3) (L4)**

12. (a) Categorize DDL Commands based on their purpose with illustrations. **(CO4) (L5)**

    (Or)

    (b) Compare and contrast various DML Commands. **(CO4) (L5)**

13. (a) Discuss control structures used in PL/SQL. **(CO5) (L4)**

    (Or)

    (b) Illustrate the use of triggers in detail with an example. **(CO5) (L3)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

Course 3: DATABASE MANAGEMENT SYSTEMS LAB
(B.Sc. Computer Science Minor)

Course Code: M-CS24401P **No. of Hours/Week: 2**

Course Objective:

To provide a strong formal foundation in database concepts and emphasis is on practice to the students to groom them into well-informed database application developers.

Course Outcomes:

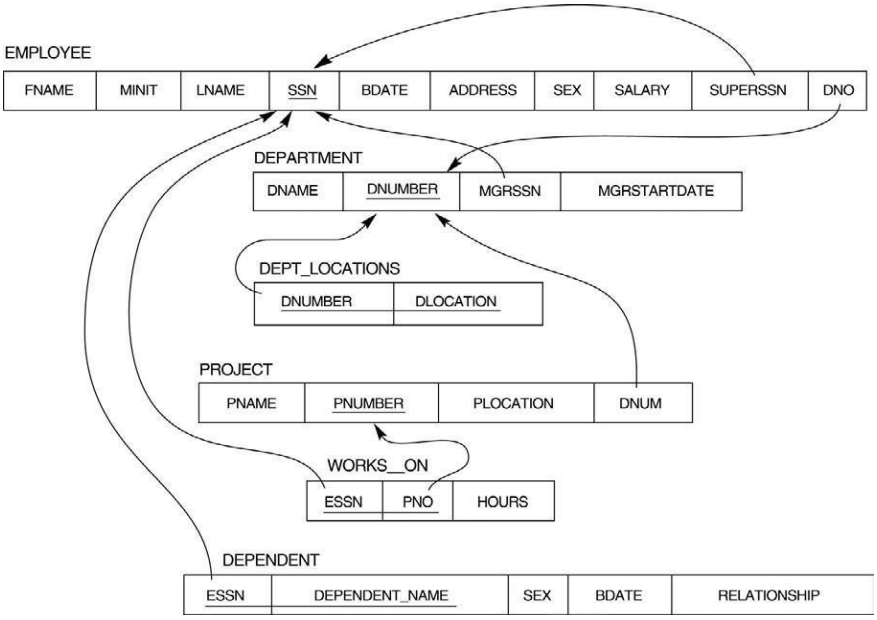
At the end of the course the student will be able to

1. Design database and ER diagrams for the real world scenarios
2. Understand ER concepts and ER mapping to relational model
3. Make use of SQL and PL/SQL to efficiently retrieve and maintain relational database.

Lab Experiments

1. Draw ER diagram for hospital administration
2. Creation of college database and establish relationships between tables
3. Relational database schema of a company is given in the following figure.

Relational Database Schema - COMPANY



Questions to be performed on above schema

1. Create above tables with relevant Primary Key, Foreign Key and other constraints
2. Populate the tables with data
3. Display all the details of all employees working in the company.

4. Display ssn, lname, fname, address of employees who work in department no 7.
5. Retrieve the Birthdate and Address of the employee whose name is 'Franklin T. Wong'
6. Retrieve the name and salary of every employee
7. Retrieve all distinct salary values
8. Retrieve all employee names whose address is in ‘Bellaire’
9. Retrieve all employees who were born during the 1950s
10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
11. Retrieve the names of all employees who do not have supervisors
12. Retrieve SSN and department name for all employees
13. Retrieve the name and address of all employees who work for the 'Research' department
14. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.
15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
16. Retrieve all combinations of Employee Name and Department Name
17. Make a list of all project numbers for projects that involve an employee whose last nameis 'Narayan’ either as a worker or as a manager of the department that controls the project.
18. Increase the salary of all employees working on the 'Product X' project by 15%. Retrieve employee name and increased salary of these employees.
19. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employeefirst name.
20. Select the names of employees whose salary does not match with salary of any employeein department 10.
21. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary,andthe average salary. Display with proper headings.
23. Find the sum of the salaries and number of employees of all employees of the ‘Marketing’ department, as well as the maximum salary, the minimum salary, and the average salary in this department.
24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
25. Delete all dependents of employee whose ssn is ‘123456789’.
26. Perform a query using alter command to drop/add field and a constraint in Employee table.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

Course 4: OBJECT ORIENTED SOFTWARE ENGINEERING
(B.Sc. Computer Science Minor)

Course Code: M-CS24402 **No. of Hours/Week: 3**

Course Objective:

To introduce Object-oriented software engineering (OOSE) - which is a popular technical approach in analyzing, designing an application, system, or business by applying the object- oriented paradigm and visual modeling.

Course Outcomes:

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

CO1: Understand and apply the fundamental principles of Object-Oriented Programming (OOP) concepts and Unified Modelling Language (UML) basics, in the development of software solutions.

CO2: Analyse and specify software requirements, develop use cases and scenarios, apply object- oriented analysis and design (OOAD) principles

CO3: Implement software construction principles using object-oriented programming languages and apply testing methodologies

CO4: Analyse and Evaluate Software Maintenance and Evolution Strategies

CO5: Apply Advanced Object-Oriented Software Engineering Concepts.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	2	1	1	3	2	2	2
CO2	3	2	3	2	1	2	3	2	2	3
CO3	2	2	3	1	1	1	2	1	2	3
CO4	3	2	3	2	1	1	3	3	2	2
CO5	3	2	3	1	1	1	3	3	2	2
Average	2.8	2	3	1.6	1	1.2	2.8	2.2	2	2.4

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Introduction to Object-Oriented Programming: Overview of software engineering, Introduction to Object-Oriented Programming (OOP) concepts (classes, objects, inheritance, polymorphism), UnifiedModelling Language (UML) basics, Introduction to software development process and softwaredevelopment life cycle (SDLC).

UNIT-II

Requirements Analysis and Design: Requirements analysis and specification, Use cases and scenarios, Object-oriented analysis and design (OOAD), Design patterns, UML modelling techniques (class diagrams, sequence diagrams, state machine diagrams, activity diagrams)

UNIT-III

Software Construction and Testing: Software construction basics, Object-oriented design principles, Object-oriented programming languages (Java, C++, Python), Software testing basics (unit testing, integration testing, system testing), Test-driven development (TDD)

UNIT-IV

Software Maintenance and Evolution: Software maintenance basics, refactoring techniques Software version control, Code review and inspection, Software evolution and reengineering.

UNIT-V

Advanced Topics in Object-Oriented Software Engineering: Model-driven engineering (MDE), Aspect-oriented programming (AOP), Component-based software engineering (CBSE), Service- oriented architecture (SOA), Agile software development and Scrum methodologies.

Additional Inputs: Requirement Elicitation Techniques, Software Development Life Cycle (SDLC) Models: Waterfall, Incremental, Spiral, Agile

Note: Additional Inputs must be excluded from evaluation

Text Books

1. An Introduction to Object-Oriented Analysis and Design and the Unified Process, 3rdEdition, Craig Larman, Prentice-Hall.
2. Programming in Java by Sachin Malhotra, Oxford University Press

Reference Books

1. Requirements engineering: processes and techniques, G.Kotonya and, I.Sommerville, 1998, Wiley
2. Design Patterns, E.Gamma, R. Helm, R. Johnson, and J. Vlissides
3. The Unified Modeling Language Reference Manual, J. Rumbaugh, I.Jacobson and G.Booch, Addison Wesley

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR IV SEMESTER

OBJECT ORIENTED SOFTWARE ENGINEERING

(B.Sc. Computer Science Minor)

Course Code: M-CS24402 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I Object-Oriented Programming**	2	2	24
2	**Unit – II Requirements Analysis and Design**	2	2	24
3	**Unit – III Software Construction and Testing**	2	2	24
4	**Unit – IV Software Maintenance and Evolution**	2	1	20
5	**Unit – V Advanced Topics in Object-Oriented Software Engineering**	2	1	20
			Total Marks	**112**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR IV SEMESTER

MODEL QUESTION PAPER

OBJECT ORIENTED SOFTWARE ENGINEERING

(B.Sc. Computer Science Minor)

Time : 3hrs **Course Code: M-CS24402** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Explain polymorphism in OOP. **(CO1) (L2)**
2. Explain the importance of UML in the software development process. **(CO1) (L2)**
3. What is a use case, and how is it utilized in the requirements analysis process? **(CO2) (L2)**
4. Distinguish between a class diagram and a sequence diagram in UML. **(CO2) (L4)**
5. Describe the main advantages of using an object-oriented Design in Software development. **(CO3) (L2)**
6. Compare and contrast corrective and adaptive maintenance with examples. **(CO3) (L5)**
7. Explain the advantages of Service-Oriented Architecture (SOA). **(CO4) (L2)**
8. What are the key roles and ceremonies in the Scrum framework? **(CO5) (L1)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Discuss the Principles and Advantages of Object-Oriented Programming (OOP). **(CO1) (L4)**

(or)

(b) Briefly describe the stages of the Software Development Life Cycle (SDLC). **(CO1) (L2)**

10. (a) Explain the need for requirements analysis and specification in the software development process. **(CO2) (L4)**

(or)

(b) Elaborate the principles and practices of Object-Oriented Analysis and Design (OOAD). **(CO2) (L4)**

11. (a) Discuss the evolution of software construction, emphasizing its significance in modern software development. **(CO3) (L4)**

(or)

(b) Explain about different types of Software Testing. **(CO3) (L4)**

12. (a) Describe the significance of software maintenance in the software development lifecycle. **(CO4) (L2)**

(or)

(b) Analyse the concept of refactoring and its role in improving code quality. **(CO4) (L4)**

13. (a) Discuss the concept of Model-Driven Engineering (MDE) and its application in modern software development. **(CO5) (L4)**

(or)

(b) Summarize the key principles of Agile Software Development **(CO5) (L2)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR - IV SEMESTER

Course 4: OBJECT ORIENTED SOFTWARE ENGINEERING LAB
(B.Sc. Computer Science Minor)

Course Code: M-CS24402 **No. of Hours/Week: 2**

Course Objective:

To develop projects using Object Oriented analysis, design and testing techniques.

Course Outcomes:

At the end of the course, the student will be able

1. To understand the software engineering methodologies involved in the phases for project development.
2. To gain knowledge about open source tools used for implementing software engineering methods.
3. To apply UML concepts in software development.

Suggested Software Tools: StarUML/UMLGraph/Topcased/Umberollo/ArgoUML/ Eclipse IDE, Visual Paradigm for UML/Rational Software Architect/Any other Open Source Tool

List of Experiments:

Select domain of interest (e.g. College Management System) and identify multi-tier software application to work on (e.g. Online Fee Collection). Analyze, design and develop this application using OOSE approach:

1. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
2. Understanding of System modeling: Data model i.e. ER – Diagram and draw the ER Diagram with generalization, specialization and aggregation of specified problem statement
3. Understanding of System modeling: Functional modeling: DFD level 0 i.e. Context Diagram and draw it
4. Understanding of System modeling: Functional modeling: DFD level 1 and DFD level 2 and draw it.
5. Identify use cases and develop the use case model.
6. Identify the business activities and develop an UML Activity diagram.
7. Identity the conceptual classes and develop a domain model with UML Class diagram.
8. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
9. Draw the state chart diagram.
10. Identify the user interface, domain objects, and technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
11. Implement the technical services layer.
12. Implement the domain objects layer.
13. Implement the user interface layer.
14. Draw component and deployment diagrams.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. CS-Minor III YEAR V SEMESTER

Course 5: WEB INTERFACE DESIGNING TECHNOLOGIES

Course Code: M-CS23501 **No. of Hours/Week: 3**

Course Objective:

To provide knowledge about Web architecture and services and inculcate the competency of building a Website.

Course Outcomes:

At the end of the course the student will be able to

CO1: Understand the fundamentals of HTML, including its structure, elements, attributes, and responsive design techniques for creating forms.

CO2: Integrate CSS for styling and layout customization for the HTML pages created.

CO3: Implement client-side validation and dynamic web features using JavaScript and DHTML for enhanced user interaction.

CO4: Apply JavaScript to manipulate HTML elements, validate data, handle events, manage browser components, and create dynamic, interactive, and user-responsive web pages.

CO5: Learn how to install word press and gain the knowledge of installing various plugins to use in their websites.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	-	-	1	3	3	3	3
CO2	2	3	3	-	-	2	3	2	2	3
CO3	3	3	3	1	2	1	3	3	2	3
CO4	3	2	2	2	2	1	3	2	3	3
CO5	2	3	3	1	1	2	3	2	3	3
Average	2.6	2.8	2.6	1.33	1.67	1.4	3	2.4	2.6	3

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT - I

HTML: Introduction to web designing, difference between web applications and desktop applications, introduction to HTML, HTML structure, elements, attributes, headings, paragraphs, images, tables, lists, blocks, symbols, embedding multi-media components in HTML, HTML forms

UNIT – II

CSS: CSS home, introduction, syntax, CSS combinators, colors, background, borders, margins, padding, height/width, text, fonts, tables, lists, position, overflow, float, pseudo class, pseudo elements, opacity, tool tips, image gallery, CSS forms, CSS counters.

UNIT – III

Java Script: What is DHTML, JavaScript, basics, variables, operators, statements, string manipulations, mathematical functions, arrays, functions. objects, regular expressions, exception handling.

UNIT-IV

Client-Side Scripting: Accessing HTML form elements using Java Script object model, basic data validations, data format validations, generating responsive messages, opening windows using java script, different kinds of dialog boxes, accessing status bar using java script, embedding basic animative features using different keyboard and mouse events.

UNIT – V

Word press: Introduction to word press, features, and advantages, installing and configuring word press and understanding its admin panel (demonstration only), working with posts, managing pages, working with media - Adding, editing, deleting media elements, working with widgets, using menus, working with themes, defining users, roles and profiles, adding external links, extending word press with plug-ins.

Additional Inputs: Working with themes-using featured images, configuring settings, customizing the site

Text Book(s)

1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley (2007)
2. Paul S.WangSanda S. Katila, an Introduction to Web Design plus Programming, Thomson (2007).

Reference Books

1. Head First HTML and CSS, Elisabeth Robson, Eric Freeman, O'Reilly Media Inc.
2. An Introduction to HTML and JavaScript: for Scientists and Engineers, David R. Brooks. Springer, 2007
3. Schaum's Easy Outline HTML, David Mercer, Mcgraw Hill Professional.
4. Word press for Beginners, Dr.Andy Williams.
5. Professional word press, Brad Williams, David damstra, Hanstern.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. CS-Minor III YEAR V SEMESTER

Course 5: WEB INTERFACE DESIGNING TECHNOLOGIES

Course Code: M-CS23501 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I HTML**	**2**	**2**	**24**
2.	**Unit – II CSS**	**2**	**2**	**24**
3.	**Unit – III Java Script**	**2**	**1**	**20**
4.	**Unit – IV Client side Validation**	**2**	**1**	**20**
5.	**Unit – V Word press**	**2**	**2**	**24**
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. CS-Minor III YEAR V SEMESTER

Course 5: WEB INTERFACE DESIGNING TECHNOLOGIES

Course Code: M-CS23501 **No. of Hours/Week: 3**

Time : 3hrs **Max Marks : 60**

SECTION-A

Answer any FIVE of the following questions. 5 X 4=20

1. What is the basic structure of an HTML document? Explain. (CO1)(L1)
2. Discuss briefly about types of lists. (CO1)(L2)
3. What are the advantages of using CSS? (CO2) (L1)
4. Distinguish between the pseudo-class and a pseudo-element. (CO2)(L4)
5. Write about functions in Javascript. (CO3)(L1)
6. What is the purpose of data validation? (CO4)(L2)
7. Give a brief account on the features of Wordpress. (CO5)(L4)
8. What is a WordPress plugin? Give one example. (CO5)(L1)

SECTION-B

Answer the following questions. 5 X 8=40

9. (a) Discuss about Text Formatting Tags in HTML. (CO1)(L4)

(Or)

(b) What are the elements of table tag? How to create a table in HTML? Explain. (CO1)(L4)

10. (a) Discuss the importance of CSS combinators and pseudo-classes with examples. (CO2) (L4)

(Or)

(b) Explain different types of Cascading Style sheets with examples. (CO2)(L2)

11. (a) Describe the different types of operators in JavaScript with examples. (CO3)(L3)

(Or)

(b) Explain JavaScript exception handling with suitable examples. (CO3) (L4)

12. (a) How can you access and manipulate HTML form elements using the JavaScript Object Model? Explain (CO4) (L4)

(Or)

(b) What are JavaScript events? Illustrate mouse and keyboard events with examples. (CO4) (L4)

13. (a) Describe the steps involved in installing and configuring WordPress for a new website. (CO5) (L4)

(Or)

(b) What are WordPress Themes? Discuss various user roles and permissions in WordPress. (CO5)(L5)

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. CS-Minor III YEAR SEMESTER-V

Course 5: WEB INTERFACE DESIGING TECHNOLOGIES

Course Code: M-CS23501P **No. of Hours/Week: 2**

Course Objective:

To inculcate knowledge on web architecture, web services, client side and server side scripting technologies and to provide skills to design interactive and dynamic web sites.

Course Outcomes:

At the end of the course the student will be able to

1. Create a basic website with the help of HTML and CSS.
2. Acquire the skill of installing word press and various plugins of Word press.
3. Create a static website with the help of Word press.
4. Create an interface for a dynamic website.
5. Apply various themes for their websites using Word press.

List of Experiments:

1. Create an HTML document with the following formatting options:
   (a) Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e) Font (Type, Size and Color), (f) Background (Colored background/Image in background), (g) Paragraph, (h) Line Break, (i) Horizontal Rule, (j) Pre tag
2. Create an HTML document which consists of:
   (a) Ordered List (b) Unordered List (c) Nested List (d) Image
3. Create a Table with four rows and five columns. Place an image in one column.
4. Using "table" tag, align the images as follows:

5. Create a menu form using html.
6. Style the menu buttons using CSS.
7. Create a form using HTML which has the following types of controls:
   (a) Text Box (b) Option/radio buttons (c) Check boxes (d) Reset and Submit buttons
8. Embed a calendar object in your web page.
9. Create a form that accepts the information from the subscriber of a mailing system.

Word press:

10. Installation and configuration of word press
11. Access admin panel and manage posts
12. Access admin panel and manage pages
13. Add widgets and menus
14. Create users and assign roles
15. Create a site and add a theme to it

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. CS-Minor III YEAR V SEMESTER

Course 6: WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL

Course Code: M-CS23502 **No. of Hours/Week: 3**

Course Objectives

To provide knowledge about development of Web Applications through Open-source tools

Course Outcomes

At the end of the course the student will be able to

CO1: Understand PHP syntax, including variables, data types, operators, and write simple programs in PHP.

CO2: Create and manipulate arrays and objects in PHP.

CO3: Develop web forms in PHP, manage form input, and perform file and directory operations in PHP, including file inclusion, reading, writing, and executing system commands

CO4: Implement cookies, and utilize session management for user state persistence.

CO5: Connect PHP with MySQL to manage data, and develop applications.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	-	-	1	3	3	3	3
CO2	2	3	3	-	-	2	3	2	2	3
CO3	3	3	3	1	2	1	3	3	2	3
CO4	3	2	2	2	2	1	3	2	3	3
CO5	2	3	3	1	1	2	3	2	3	3
Average	2.6	2.8	2.6	1.33	1.67	1.4	3	2.4	2.6	3

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

The building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. **Flow Control Functions in PHP**: Switching Flow, Loops, Code Blocks and Browser Output.**Working with Functions:** Creating functions, Calling functions, Returning the values from User- Defined Functions, Variable Scope, Saving state between Function calls with the static statement,arguments of functions

UNIT-II

Working with Arrays: Creating Arrays, Some Array-Related Functions.

Working with Objects: Creating Objects, Accessing Object Instances, **Working with Strings**, **Dates and Time:** Formatting strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

UNIT-III

Working with Forms: Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state,

Redirectingthe user, Sending Mail on Form Submission, and **Working with File Uploads**, Managing files onserver, **Exception handling.**

UNIT-IV

Working with Cookies and User Sessions: Introducing Cookies, setting a Cookie with PHP, Session Function Overview, starting a Session, working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users.

UNIT-V

Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, connecting to MySQL with PHP, Working with MySQL Data. Planning and Creating Database Tables, Creating Menu, Creating Record Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism.

Additional Inputs: Working with Images: Understanding the Image-Creation Process, Necessary Modifications to PHP, Drawing a New Image

Text Book(s)

1. Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson Education (2007).
2. Steven Holzner , PHP: The Complete Reference, McGraw-Hill

Reference Books

1. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition O'reilly, 2014
2. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).

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DEPARTMENT OF COMPUTER SCIENCE
B.Sc. CS-Minor – III YEAR V SEMESTER

WEB APPLICATIONS DEVELOPMENT USING PHP& MYSQL

Course Code: M-CS23502 **No. of Hours/Week: 3**

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I The Building blocks of PHP**	**2**	**2**	**24**
2.	**Unit – II Working with Arrays**	**2**	**2**	**24**
3.	**Unit – III Working with Forms**	**2**	**2**	**24**
4.	**Unit – IV Working with Files and Directories**	**2**	**1**	**20**
5.	**Unit – V Interacting with MySQL using PHP**	**2**	**1**	**20**
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

MODEL QUESTION PAPER

III B.Sc. CS-Minor - V SEMESTER

WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL

Time : 3hrs **Course Code: M-CS23502** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 x 4=20**

1. What is a variable? How to declare a variable in PHP? **(CO1) (L1)**
2. Differentiate between while and do-while. **(CO1) (L4)**
3. Give a brief account on Date and Time functions. **(CO2) (L2)**
4. Write about formatting strings in PHP. **(CO2) (L2)**
5. Interpret the steps involved in Form submission. **(CO3) (L5)**
6. Explain about Exceptional Handling. **(CO3) (L4)**
7. Write about Session Variables. **(CO4) (L4)**
8. Write about MySQLi Functions. **(CO5) (L2)**

SECTION-B

II. Answer the following questions. **5 x 8=40**

9. (a) List the data types in PHP. Explain. **(CO1) (L2)**

(Or)

(b) Elaborate on the operators used in PHP. **(CO1) (L2)**

10. (a) What is an Array? Explain initialization of arrays with examples. **(CO2) (L3)**

(Or)

(b) Describe the process of creation of Objects in PHP. **(CO2) (L4)**

11. (a) Elucidate the process of creating forms in PHP. **(CO3) (L4)**

(Or)

(b) Explain about sending mail on Form submission. **(CO3) (L2)**

12. (a) Discuss about Working with Cookies in PHP. **(CO4) (L5)**

(Or)

(b) Write about Session Creation, Destroying and Unsetting in PHP. **(CO4) (L5)**

13. (a) Explain about connecting to MySQL with PHP. **(CO5) (L3)**

(Or)

(b) Explain about Record Addition and Record Deletion mechanisms. **(CO2) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc.-CS Minor III YEAR V SEMESTER

Course 6: WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL

Course Code: M-CS23502P **No. of Hours/Week: 2**

Course Objective:

To inculcate knowledge on web applications using PHP and MYSQL Lab.

Course Outcomes:

At the end of the course the student will be able to

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

List of Experiments

1. Write a PHP program to Display "Hello"
2. Write a PHP Program to display the today's date.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
6. Create student registration form using text box, check box, radio button, select, submit button.And display user inserted value in new PHP page.
7. Create Website Registration Form using text box, check box, radio button, select, submitbutton. And display user inserted value in new PHP page.
8. Write PHP script to demonstrate passing variables with cookies.
9. Write a PHP script to connect MySQL server from your website.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to perform CRUD (Create, Read, Update and Delete) operations on a database table.
12. Create a web site using any open-source framework built on PHP and MySQL – It is a team activity wherein students are divided into multiple groups and each group comes up with theirown website with basic features.