SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
(An autonomous college in the jurisdiction of Krishna University, Machilipatnam)
DEPARTMENT OF COMPUTER SCIENCE

CBCS SINGLE MAJOR CURRICULAR FRAMEWORK (2023-24 ADMITTED BATCH ANDONWARDS)									
TABLE 3: B.Sc. Honours (Computer Science Section A & B)SEMESTER - III									
S. NO	**Name of the Course**	**Course Code**	**Part No**	**Type of the Paper**	**Total Marks**	**IA**	**SEE**	**Teaching Hours**	**Credits**
1	Data Structures	23CSMAL231	II	Core Theory	100	30	70	4	3
2	Object Oriented Programming Using Java	23CSMAL232	II	Core Theory	100	30	70	4	3
3	Data Analysisusing Python	23DSMIL231	II	Core Theory(MINOR)	100	30	70	4	3
4	Data Structures -Lab	23CSMAP231	II	Core Practical	50	15	35	2	1
5	Object Oriented ProgrammingUsing Java Lab	23CSMAP232	II	Core Practical	50	15	35	2	1
6	Data Analysisusing Python Lab	23DSMIP231	II	Core Practical(Minor)	50	15	35	2	1

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CBCS SINGLE MAJOR CURRICULAR FRAMEWORK
(2023-24 ADMITTED BATCH ANDONWARDS)

TABLE 3: B.Sc. Honours (Computer Science and Cognitive Systems)
SEMESTER - III

S.NO	Name of the Course	Course Code	Part No	Type of the Paper	Total Marks	IA	SEE	Teaching Hours	Credits
1	Data Structures	23CGMAL231	II	Core Theory	100	30	70	4	3
2	Computer Networks	23CGMAL232	II	Core Theory	100	30	70	4	3
3	Database Management Systems	23CGMAL233	II	Core Theory	100	30	70	4	3
4	Object Oriented Programming using Java	23CGMAL234	II	Core Theory	100	30	70	4	3
5	Data Analysis using Python	23AIMIL232	II	Core Theory	100	30	70	4	3
6	Data Structures -Lab	23CGMAP231	II	Core Practical	50	15	35	2	1
7	Computer Networks Lab	23CGMAP232	II	Core Practical	50	15	35	2	1
8	Database Management Systems Lab	23CGMAP233	II	Core Practical	50	15	35	2	1
9	Object Oriented Programming using Java Lab	23CGMAP234	II	Core Practical	50	15	35	2	1
10	Data Analysis Using Python Lab	23AIMIP232	II	Core Practical	50	15	35	2	1

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CBCS SINGLE MAJOR CURRICULAR FRAMEWORK (2023-24 ADMITTED BATCH AND ONWARDS)

TABLE 3: B. Com Honours Computer Applications
SEMESTER - III

S.NO	Name of theCourse	Course Code	Part No	Type of the Paper	Total Marks	IA	SEE	Teaching Hours	Credits
1	Ecommerce&Web Designing	23CAMAL231	II	Core Theory	100	30	70	4	3
2	Ecommerce&Web Designing Lab	23CAMAP231	II	Core Practical	50	15	35	2	1

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Course Code				23CSMAL231,23CGMAL231			
Title of the Course				**Data Structures**			
Offered to: (Programme/s)				**B.Sc.Honours(Computer Science Section A& B),B.Sc Hons(Computer Science with Cognitive Systems)**			
L	**4**	**T**	**0**	**P**	**2**	**C**	**4**
Year of Introduction		**2024-25**		**Semester:**			**3**
Course Category:		**Major**		**Course Relates to:**		**Global**	
Year of Revision:				**Percentage:**			
Type of the Course:				**Employability**			
Crosscutting Issues of theCourse :							
Pre-requisites, if any				Basic knowledge of programming concepts Familiarity with the C programming language isrecommended.			

Course Description:

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

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Understand various Data Structures for data storage and processing.
2	Realize Linked List Data Structure for various operations
3	Analyze step by step and develop algorithms to solve real world problems by implementing Stacks, Queues data structures.
4	Understand and implement various searching & sorting techniques
5	Understand the Non-Linear Data Structures such as Binary Trees and Graphs

Course Outcomes

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

CONO	COURSE OUTCOME	BTL	PO	PSO
CO1	Describe and differentiate between various data structures and their uses.	**K2**	**6,7**	**1,2**
CO2	Implement and manipulate data structures using C.	**K3**	**6,7**	**1,2**
CO3	Analyze and evaluate the efficiency of algorithms.	**K4**	**6,7**	**1,2**
CO4	Solve complex problems by selecting and applying appropriate data structures.	**K3**	**6,7**	**1,2**
CO5	Demonstrate proficiency in dynamic memory management and pointer manipulation in C.	**K3**	**6,7**	**1,2**

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						2	3		
CO2						3	2		
CO3					3	2	3		
CO4						3	3		
CO5						3	3		

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure:

Data structures

Unit -1: Introduction to data structures: Types of data structures-Primitive data structures, Nonprimitive data structures – linear data structures, nonlinear data structures, real world applications of data structures, Abstract data types-ADT for stack, queue, linked list,Performance analysis of algorithms-time complexity, space complexity. (10Hrs) **Description:**

Data structures are fundamental concepts in computer science and programming, designed to organize, manage, and store data efficiently. Understanding data structures is essential for solving complex problems and optimizing the performance of software.

Examples:

Time Complexity: Looking up a specific page number in a well-organized notebook. If youknow the page number, you can go directly to that page without flipping through the rest ofthe notebook. The time taken is the same regardless of how many pages are in the notebook. **Space Complexity:**Exchanging two items between your hands. No matter how large theitems or how many times you swap, you only need a fixed amount of space (your two hands).Similarly, the algorithm only requires a constant amount of extra space, regardless of theinput size.

Exercises

Program to insert, update, delete an element

Learning Outcomes:

Understand various Data Structures for data storage and processing.**Specific Resources: (web)** https://onlinecourses.swayam2.ac.in/nou24_cs15/preview

Unit – 2 : Linear Data Structures **(**14Hrs)

Linked List: Introduction to Linked Lists, linked lists ADT, Comparison between Linked Listand Array, Types of Linked Lists and their implementations - Singly Linked list, Doubly Linked list, Circularly Singly Linked list, Application of linked lists

Description:

Linear data structures are data structures where elements are arranged sequentially, one after another. In a linear data structure, each element has a unique predecessor and successor (except the first and last elements). These structures are simple and easy to implement, making them foundational in computer science.

Examples:

The university's administration requires a system to manage student records, which include operations such as adding, searching, updating, and deleting student records as well as deleting student reports

Exercises:

Implement Single Linked List with insertion, deletion and traversal operations

Learning Outcomes:

Realize Linked List Data Structure for various operations.

Specific Resources: (web)

https://onlinecourses.swayam2.ac.in/nou24_cs15/preview

Unit – 3 : Stacks: (14Hrs)

Introduction to stack, Stack ADT, stacks using array and Linked List, Application of stacks – Converting Infix to Post Fix Notation - Evaluation of Post Fix Notation - Tower of Hanoi, Recursion: Introduction to Queue, Queue ADT, Queues using arrays and Linked List, Application of Queues Types of Queues- Circular Queues, De-queues, Priority Queue **Description:** A stack is a linear data structure that follows the Last In, First Out (LIFO) principle. This means that the last element added to the stack will be the first one to be removed. Stacks are used in various applications, including algorithm implementation, memory management, and backtracking problems.

Examples:

To store data of books in a last-in, first-out (LIFO) manner.

An online bookstore needs to manage its inventory, process customer orders, and recommendbooks to users. To achieve these tasks efficiently, the bookstore must use various data structures.

Exercises:

Programs to implement the Queue operations using an array and linked Lists

Learning Outcomes:

Analyze step by step and develop algorithms to solve real world problems by implementingStacks, Queues data structures

Specific Resources: (web)

https://onlinecourses.swayam2.ac.in/nou24_cs15/preview

Unit – 4 : Searching: (8 Hrs)

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

Description:

Searching is the process of finding a particular element or a set of elements in a collection of data. It is a fundamental operation in computer science, crucial for various applications like databases, information retrieval, and algorithms.

Examples:To search books based on user requirement such as specific book title , author etc …. Imagine an online bookstore where books are stored in an array or a list. If a usersearches for a book by its title, the system can use linear search to find the book.

Exercises:

- program to search an item in a given list using Linear Search & Binary Search.
- Searching Algorithms
- program for implementation of Bubble Sort Insertion Sort Quick Sort SortingAlgorithms

Learning Outcomes:

Understand and implement various searching & sorting techniques.

Specific Resources: (web)

https://onlinecourses.swayam2.ac.in/nou24_cs15/preview

Unit – 5 : Binary Trees: (14Hrs)

Introduction to 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), Application of Graphs.

Description:

A binary tree is a hierarchical data structure in which each node has at most two children, referred to as the left child and the right child. Binary trees are used in various applications, such as searching, sorting, and representing hierarchical data like file systems.

Examples:

To search books based on user requirement such as ISBN or ISSN number. Imagine an online bookstore where books are stored in an array or a list. If a user searches for a book by its ISSN or ISBN number, the system can use binary search tree to store and retrieve the book based on unique keys.

Exercises:

program for Binary Search Tree Traversals

Learning Outcomes:

Understand the Non-Linear Data Structures such as Binary Trees and Graphs

Specific Resources: (web) https://onlinecourses.swayam2.ac.in/nou24_cs15/preview**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 .
3. Michael T. Goodrich, Roberto Tamassia, David M. Mount "Data Structures and Algorithms in C++", Wiley India.

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SEMESTER -END QUESTION PAPER STRUCTURE

Course Code & Title of the Course:	**23CSMAL231,23CGSMAL231 Data Structures**
Offered to:	**B.Sc.Honours(Computer Science Section A& B),B.Sc Hons(Computer Science with Cognitive Systems)**
Category:	**SEMESTER: 3**
Max. Marks	**70**
Max.Time	**3 Hrs**

Section A: Short Answer Questions (20 Marks)

Answer All questions. Each question carries 4 Marks.

1 a) Write ADT for stacks and explain it. K1

(or)

b) Write real world applications of data structures K12

2. a) compare linked lists with arrays K2

(or)

b) Explain about different types of linked lists K2

3 a) Write differences between stacks and queues K2

(or)

b) convert following expression from infix to postfix. K2

a+b*c+(d*e+f) +g.

4 a) Write program for linear search. K1

(or)

b) Write program for Bubble sort. K1

5 a) Discuss applications of graphs. K2

(or)

b) Explain with examples sequential and linked representation of graphs. K2

Section B: Long Answer Questions (50 Marks)

Answer All questions. Each question carries 10 Marks.

6 a) Give classification of Data structures and explain them. K2

(or)

b) Explain about analysis of algorithms. K2

7 a) Develop code insertion and deletion in single linked list. K2

(or)

b) Write functions for insertion, display of values in doubly linked list. K2

8 a) Write code to implement queues using arrays. K2

(or)

b) Write code to implement stacks using linked list. K2

9 a) Write program for binary search. K2

(or)

b) Apply quick sort for below given values and write code to implement quick sort. K2

11 2 9 13 57 25 17 1 90 3.

10 a) Explain with code deletion in binary search tree. K2

(or)

b) Explain Depth first search with an example. K2

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Course Code				**23CSMAP231,23CGSMAP231**			
Title of the Course				**DATA STRUCTURES LAB**			
Offered to: (Programme/s)				**B.Sc.Honours(Computer Science Section A& B),B.Sc Hons(Computer Science with Cognitive Systems)**			
L	**0**	**T**	**0**	**P**	**2**	**C**	**1**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:		**MAJOR**		**Course Relates to:**		**GLOBAL**	
Year of Revision:				**Percentage:**			
Type of the Course:				**Major**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				**Programming knowledge**			

Course Description:

The objective of course is to provide students with practical experience in using data structures. Students will learn to perform data manipulation and retrieval, implement advanced techniques in real life applicatons.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Students will learn to implement fundamental data structures such as arrays, linked lists, stacks, queues, and hash tables.
2	Students will explore and implement more complex data structures including trees and graphs.
3	Students will analyse the time and space complexity of different data structures and their operations.
4	Students will apply data structures to solve practical problems, enhancing their problem-solving and programming skills.
5	Students will improve their proficiency in programming languages commonly used for data structures, such as C++, Java, or Python.

Course Outcomes

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

CONO	COURSE OUTCOME	BTL	PO	PSO
CO1	Implement and manipulate basic and advanced data structures.	K2	6,7	1,2
CO2	Analyze the performance of data structures and algorithms.	K3	6,7	1,2
CO3	Apply data structures to solve practical computing problems.	K3	6,7	1,2
CO4	Develop efficient and optimized code for various data structure operations.	K3	6,7	1,2
CO5	Demonstrate proficiency in a programming language used for data structure implementation.	K3	6,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						2	3	2	2
CO2						3	2	2	3
CO3					3	2	3	3	2
CO4						3	3	2	3
CO5						3	3	3	3

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of a Data structures lab course, providing hands-on practicewith various data structures, enabling students to implement and manipulate these structures to solve real-world problems efficiently. Through a series of programming exercises and projects, students will develop practical skills in designing, analysing, and optimizing data structures.

Unit 1: Basic Concepts: (6Hrs)

Lab 1:

1. Time Complexity calculation on Linear & Binary Search

Exercise 1:

Linear and binary search :

Objective: Learn to calculate time complexity on linear search binary searchTasks:

Write a program to calculate time complexity for

- **Linear Search**
- **Bin ary SearchLab 2:**

2. Time Complexity calculation on Bubble Sort

Bubble Sort

Objective: Learn to calculate time complexity on Bubble sortTasks:

Write a program to calculate time complexity for Bubble Sort

Unit 2: Linear Data Structures

Lab 3:

1. Single Linked Lists

Representation of Single Linked Lists

1. **Objective: To understand the concept and types of linked lists better**
2. **Tasks:**

Write Program to implement Single Linked List with insertion, deletion and traversaloperations

Lab 4:

2. Double Linked Lists

Representation of Double Linked Lists

1. **Objective: To understand the concept and types of linked lists better**
2. **Tasks:**

Write Program to implement Double Linked List with insertion, deletion and traversaloperations

Lab 4:

3. Circular Linked Lists

Representation of Circular Linked Lists

1. **Objective: To understand the concept and types of linked lists better**
2. **Tasks:**
3. Write Program to implement Circular Linked List with insertion, deletion andtraversal operations

Unit 3: Stacks

Lab 5: Stack Operations

Implementing stacks in linked Lists and arrays

1. **Objective:** Understanding to implement stacks in linked lists and arrays

Lab 6:

Write Programs to implement the Stack operations using an array .

Write Programs to implement the Stack operations using Linked List. Write Programs to implement the Queue operations using an array. Write Programs to implement the Queue operations using Linked List.

Unit 4:

Searching

1. Quick Sort

Lab 7:

Objective: Implementation of Sorting Algorithms

1. Tasks:

a.) Write a program for implementation of the following Sorting Algorithmsi)Bubble Sort ii) Insertion Sort iii)Quick Sort

b.) Write a program for implementation of Selection Sort

Unit 5: Binary Search Trees (6Hrs)

Lab 8:

Creation of binary trees and tree traversals

1. Binary Trees:

Objective: Understanding **Creation of binary trees and tree traversals**

Write a program for Binary Search Tree Traversals

References:

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, Roberto Tamassia, David M. Mount "Data Structures andAlgorithms in C++", Wiley India.

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23CSMAP231,23CGSMAP231: DATA STRUCTURES LAB
Offered to: B.Sc.Honours(Computer Science Section A& B),B.Sc Hons(Computer Science with Cognitive Systems)
Semester: IIIMax. Marks : 50 (CIA: 15 + SEE: 35) Hrs/Week: 2

Model Paper : Practicals

Time: 3 Hrs. **Max. Marks: 35**

Section – A

1. Experiment-1 15 M

2. Experiment-2 10 M

Section – B

Viva Voce 10 M

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Course Code				23CSMAL232			
Title of the Course				**Object Oriented Programming Using Java**			
Offered to: (Programmes)				**B.Sc.Honours(Computer Science Section A& B)**			
L	**4**	**T**	**0**	**P**	**0**		**4**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:	**MAJOR**			**Course Relates to:**		**GLOBAL**	
Year of Introduction:	**2024**			**Percentage:**		**NA**	
Type of the Course:				**MAJOR**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				Knowledge in C Programming			

Course Description:

This course provides the fundamental components and libraries of the Java programming language, with a strong emphasis on object-oriented programming (OOP) principles. It constitutes as the foundation for Java development, providing the essential building blocks and features for creating robust and scalable applications.

Course Aims & Objectives:

S. No	COURSE OBJECTIVES
1	Understand fundamentals of programming such as variables, conditionaland iterative execution, methods, etc.
2	Realize fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3	Analyze step by step and develop programs on inheritance and interfaces,arrays and string handling functions
4	Understand the Fundamental features of multi-threaded programs, Exception handling and packages.
5	Understand the principles of applets, I/O streams in java and java database connectivity

Course Outcomes:

At the end of the course, the student will / will be…

NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Develop a comprehensive understanding how object-oriented concepts are incorporated into the Java programming language	K2	1,2,6	1,2
CO2	Implementing Object Oriented Programming Concepts(class, constructor, overloading) in java	K3	2,6	1,2
CO3	Implementing inheritance and interfaces in a Java program.	K3	2,6	1,2
CO4	Implementing Multithreading, exception handling and packages in Java.	K3	2,6	1,2
CO5	Implementing Applets, Files and Jdbc Connectivity in Java programs.	K3	2,6	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO-PSO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	3				2		2	1
CO2		3				2		2	1
CO3		3				2		2	1
CO4		3				2		2	1
CO5		3				2		2	1

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between

CO-PO-PSO respectivelyCourse Structure:

Unit – I: Introduction to Java Programming (12 Hrs.)

Introduction-Object Oriented paradigm-Basic Concepts of OOP-Benefits of OOP-Applications of OOP- Java features-Simple Java program structure-Java tokens-Java Statements-Implementing a Java Program-Java Virtual Machine-Command line arguments- Constants-Variables-Data Types-Declaration of Variables-Giving Value to Variables-Scopeof variables-Symbolic Constants-Type casting-Getting Value of Variables - types of operators with examples-expressions

Description:

This course is tailored to understand fundamentals of programming such as variables,conditional and iterative execution, methods, etc.

Examples:

1. Operators concept in java
2. Type casting in java

Exercises:

1. **Design Java program to perform Type Casting in java.**
2. **Develop a Java program for sorting a given list of names in ascending order.**

Learning Outcomes:

By the end of the unit, students will understand the concept and underlying principles of Object-Oriented Programming and object-oriented concepts are incorporated into the Java programming language

Web Resources:

Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of Java Programming", 2018.

https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

Unit – II: Control statements, Classes, Objects and Methods (12 Hrs.)

Introduction-Decision making with if statement-Simple if statement-If Else statement- Nesting of if else statements-The else if ladder-The switch statement-The conditional operator-The While statement-The do-while statement-The for statement- Jumps in loops- Defining a class-Adding variables-Adding methods-Creating objects-Accessing class members-Constructors-Method overloading-Static members-Nesting of methods

Description:

This unit provides fundamentals of object-oriented programming in Java, including definingclasses, invoking methods, using class libraries, etc.

Examples:

1. Control statements in java
2. Constructors, Method overloading, Static keyword in java

Exercises:

1.Create a class Rectangle. The class has attributes length and width. It should have methodsthat calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.

2. Construct a Java program that implements method overloading

Learning Outcomes:

By the end of this unit, students will be able to gain knowledge in Implementing ObjectOriented Programming Concepts like class, constructor, overloading concepts in java

Web Resources:

Introduction to Classes and Objects in Java , Neso Academy, 7 june 2020
https://www.youtube.com/watch?v=W-D71ZeMixQ&list=PLBlnK6fEyqRiwWLbSXKFtdGV8OVqr9dZr

Unit – III: Arrays, Strings, Inheritance and Interfaces (12 Hrs.)

Extending a class-Overloading methods-Final variables and methods-Final classes-Abstract methods and classes-Arrays- One dimensional arrays- Creating an array – Two dimensionalarrays-Strings- Wrapper classes Multiple Inheritance: Introduction- Defining interfaces- Extending interfaces-Implementing interfaces-Accessing interface variables

Description:

This unit helps in understanding the principles of inheritance and interfaces, array creation and string handling functions

Examples:

1. Types of inheritances.
2. String handling functions and array creation in java

Exercises:

1. **Design a Java program to calculate multiplication of 2 matrices**
2. **Develop a program on Multiple**

Inheritance.Learning Outcomes:

By the end of this unit, students will be able to understand and implement inheritance andinterfaces, array creation and string handling functions in a Java program.

Web Resources:

1.Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Inheritance in Java",2018.
https://www.youtube.com/watch?v=rxsl1TzcEgg

2. Arrays in Java by Neso Academy,2019
https://www.youtube.com/watch?v=kWJHzambtNo&list=PLBlnK6fEyqRiraym3T703apTvE ZLaSVtJ

3.What is string in Java **by Lab Mug** ,2023

https://www.youtube.com/watch?v=Vv8ijzbz22s

Unit – IV: Multi-Threading, Exception Handling and Packages (12

Hrs.)

Introduction-Creating Threads-Extending the Threads-Stopping and Blocking a Thread-Lifecycle of a Thread- Using Thread Methods-Thread Exceptions-Thread Priority-Implementing the 'Runnable' Interface-Types of errors-Compile time errors-Run-time errors- Exceptions-Exception handling-Multiple Catch Statements-Using finally statement-Java APIPackages-Creating Packages-Accessing a Package- Using a Package.

Description:

This unit helps in understanding and implementing multi-threaded programs, Exceptionhandling and packages.

Examples:

1. Multi-threading in java
2. Types of exception handling mechanisms

Exercises:

1. **Develop a program to create and Import Packages**
2. **Construct Java programs to implement various types of Exception HandlingMechanisms**

Learning Outcomes:

By the end of this unit, students will be able to Implement Multithreading, exception handlingand packages in Java

Resources:

1. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Packages in Java", 2018.
https://www.youtube.com/watch?v=TwU3cv1FFis&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=17
2. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Exception Handling inJava", 2018.
https://www.youtube.com/watch?v=vUov8EkjZjU&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=23
3. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Multi Threading inJava", 2018.
https://www.youtube.com/watch?v=6rYOyIGfy3w&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=27

Unit – V: Applets, Streams, I/O Files and Jdbc (12 Hrs.)

Local and remote applets-Applets and Applications-Building Applet code-Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state-Concept of Streams-Stream classes-Byte Stream Classes-Character Stream classes: Reader stream classes, Writer Stream classes-Reading and writing files.

Jdbc introduction-stages in Jdbc program-working with oracle database: inserting, updating and deleting records.

Description:

This unit focuses Understanding the principles of applets, I/O streams in java and javadatabase connectivity

Examples:

1. Applet creation
2. Writing and Reading Files.

3. JDBC Connectivity

Exercises:

1. **Design a program to create an Applet**
2. Create a program for writing and reading Files.

Learning Outcomes:

By the end of this unit, students will be able to implement graphical user interface in Javaprograms, Input/output Streams in java and java database connectivity with oracle

Resources:

1.Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Applet Programming inJava", 2018.
https://www.youtube.com/watch?v=cC_Ij7WmP_k&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=34

2.Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur." JDBC", 2018.
https://www.youtube.com/watch?v=ajhWv31oN1k&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=50

3. "File Handling in Java", Learn Coding, 2021.

https://www.youtube.com/watch?v=VJgCjLuU4e8&list=PLqleLpAMfxGDVu5tUmUg9jSQ UUB8_5DB0

Specific Resources:

Text Books:

1. E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-HillCompany.

Reference Books:

1. Programming in Java by Sachin Malhotra, OXFORD University Press
2. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series,TATA McGraw-Hill Company.
3. Deitel &Deitel. Java TM: How to Program, PHI (2007)
4. Java Programming: From Problem Analysis to Program Design- D.S Mallik
5. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press(2008)

Web Resources:

Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of JavaProgramming", 2018.

https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
(An autonomous college in the jurisdiction of Krishna University, Machilipatnam)
SEMESTER -END QUESTION PAPER STRUCTURE

Course Code & Title of the Course:	**23CSMAL232 Object Oriented Programming Using Java**
Offered to:	**B.Sc.Honours(Computer Science Section A& B)**
Category:	**SEMESTER: 3**
Max. Marks	**70**
Max.Time	**3 Hrs**

Section A: Short Answer Questions (20 Marks)
Answer All questions. Each question carries 4 Marks.

1. a)Discuss about JVM. k2
   OR
   b)Explain command line arguments with an example k2
2. a) Explain method overloading with an example. k2
   OR
   b)Discuss concept of static members in java with example. k2
3. a)Discuss about final class k2
   b)Illustrate implementing interfaces in java with example. k3
4. a) Describe creating threads in java with an example k4
   OR
   b)Describe package creation and accessing with example.k4
5. a) Explain character stream classes in java. k2
   OR
   b) Explain applet creation with example. k2

Section B: Long Answer Questions (50 Marks) Answer All questions. Each question carries 10 Marks.

6. a) Discuss Object Oriented Programming Principles. k2)(OR)
   b)Discuss Java Buzz words.k2)
7. a) Explain accessing class members with an example. k2
   (OR)
   b)Explain Constructor with an example. k2
8. a) Illustrate string handling methods in java with examples. k3
   (OR)
   b)List of different types of inheritance in java and explain with examples. k2
9. a) Explain life cycle of a thread with neat diagram. k2
   (OR)
   b) Define Exception. Explain Exception handling mechanism in java with examplesk2
10. a) Explain life cycle of applet with neat diagram. k2
    10. (OR)
    b)Explain different stages in JDBC program with an example.k2

Note:

- Short answer questions assess foundational knowledge (Remembering, Understanding and Apply).
- This structure emphasizes a focus on higher-order thinking skills (Understand, Application, Analysis, and Evaluation) in the long answer section.
- Consider including a mix of question types within each section to ensure acomprehensive assessment.

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Course Code				**23CSMAP232**			
Title of the Course				**Object Oriented Programming Using Java Lab**			
Offered to: (Programme/s)				**B.Sc.Honours(Computer Science Section A& B)**			
L	**0**	**T**	**0**	**P**	**2**	**C**	**1**
Year of Introduction:	**2024-25**			**Semester:**			**3**
Course Category:	**Major**			**Course Relates to:**		**Global**	
Year of Revision:				**Percentage:**			
Type of the Course:				**Employability**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				**Programming knowledge**			

Course Description:

The objective of course is to provide students with practical experience in Object Oriented Programming in Java.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Teach students to know the fundamental concepts in java
2	Provide comprehensive training in designing classes, objects and methods in java
3	Teach students to know inheritance, interfaces concepts in java
4	Train students to gain knowledge in multi threading , exception handling and packages
5	Train students to know Applets Creation,File Creation and JDBC Connectivity

Course Outcomes

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

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Creating java programs that covers fundamental concepts	K6	1,2,6	1,2
CO2	Creating class, constructor, method overloading, method overriding in java.	K6	2,6	1,2
CO3	Creating different types of inheritance and interfaces in a Java program	K6	2,6	1,2
CO4	Creating Multithreading, different types of exception handling mechanisms, Creating and accessing packages in Java.	K6	2,6	1,2
CO5	Creating Applets,files and JDBC Connectivity in Java program.	K6	2,6	1,2

CO-PO MATRIX

CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	3				2		2	1
CO2		3				2		2	1
CO3		3				2		2	1
CO4		3				2		2	1
CO5		3				2		2	1

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSOrespectively

Course Structure

This lab list covers the key areas of Object Oriented Programming in Java Lab course,providing hands-on practice

Unit-1: Introduction to Java Programming Lab 1

1. Design Java program to perform Type Casting in java..
2. Develop a Java program for sorting a given list of names in ascending order.

Unit-2: Control statements, Classes, Objects and Methods Lab 2

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. Construct a Java program that implements method overloading.

Unit-3: Inheritance, Arrays, Strings and Interfaces

Lab 3

5. Design a Java program to calculate multiplication of 2 matrices**.**
6. Construct Java programs to implement various types of inheritance
   i. Single ii. Multi-Level iii. Hierarchical iv. Hybrid

Lab 4

7. Write a java program to implement runtime polymorphism.
8. Develop java program to implement Abstract Classes and Final Keyword

Lab 5

9. Design a program for implementing interfaces.
10. Develop a program on Multiple Inheritance.

Unit-4: Multi-Threading, Exception Handling and Packages

Lab 6

11. 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.
12. Develop 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 byusing extending Thread class.

Lab 7

13. Develop 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.
14. Construct program to create and Import Packages

Lab 8

15. Construct Java program to implement various types of Exception HandlingMechanisms
    i. Arithmetic Exception
    ii. Number Format Exception
    iii. ArrayIndexOutofBounds Exception
16. Design a program to demonstrate Catch Blocks

Unit-5: Applets, Streams, Files and Jdbc

Lab -9

17. Design a program to create an Applet
18. Create a program for writing and reading Files.

Lab -10

19. Design a program to insert records in DB table using JDBC.
20. Develop a program to Retrieve records from DB table using JDBC

REFERENCES:

1. E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-HillCompany.

Web Resources:

Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of JavaProgramming", 2018. https://www.youtube.com/watch?v=OjdT2l- EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
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23CSMAP232:Object Oriented Programming Using Java Lab

Offered to: B.Sc.Honours(Computer Science Section A& B)
Semester: III
Max. Marks : 50 (CIA: 15 + SEE: 35) **Hrs/Week: 2**

Model Paper : Practicals

Time: 3 Hrs. **Max. Marks: 35**

Section – A

1. Experiment-1 15 M

2. Experiment-2 10 M

Section – B

Viva Voce 10 M

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Course Code				**23CGMAL232**			
Title of the Course				**Database Management Systems**			
Offered to: (Programmes)				**B.Sc. Honours (Computer Science with Cognitive Systems)**			
L	**4**	**T**	**0**	**P**	**2**	**C**	**4**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:		**Major**		**Course Relates to:**		**Global**	
Year of Revision:				**Percentage:**			
Type of the Course:				**Employability**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				Basic understanding of computer science principles.			

Course Description:

This course provides an in-depth introduction to Database Management Systems (DBMS). Students will explore the fundamental concepts and techniques for designing, implementing, and managing databases.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Introduce students to the fundamental concepts of databases and demonstrate the processof data modeling using the Entity-Relationship (ER) model and relational model, emphasizing the importance of attributes, keys, and constraints.
2	Ensure students to get proficiency in SQL Data Definition and Management
3	Provide students to write and optimize complex SQL queries to manage and retrieve data.
4	Develop efficient PL/SQL programs to access Oracle databases
5	Enable students to manage data retrieval using implicit and explicit cursors

Course Outcomes

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

CONO	COURSE OUTCOME	BTL	PO	PS O
CO1	Develop a comprehensive understanding of database concepts to design efficient and normalized relational databases.	**K2**	**6,7**	**1,2**
CO2	Demonstrate proficiency in using SQL for defining and manipulating database structures	**K3**	**6,7**	**1,2**
CO3	Develop the ability to perform data manipulation operations	**K3**	**6,7**	**1,2**
CO4	Gain proficiency in developing PL/SQL programs	**K3**	**6,7**	**1,2**
CO5	Effectively Manage Data Retrieval and Error Handling using PL/SQL	**K3**	**6,7**	**1,2**

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						2	3	2	2
CO2						3	2	2	3
CO3					3	2	3	3	2
CO4						3	3	2	3
CO5						3	3	3	3

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

Unit – 1 : Database Concepts-A Relational approach(12Hrs)

Database - Relationships - DBMS - Relational data model - Integrity rules. Database Design:Data modeling -Dependency - Database design - Normal forms - Dependency diagrams – De normalization

- **Description:**

This unit introduces the basics of databases, covering their purpose, users, and benefits. It explains key concepts such as data models, schemas, and the three-schema architecture, emphasizing data independence. The unit also explores database languages, interfaces, and different DBMS architectures, including centralized and client/server models, and classifies various DBMS types.

- **Learning Outcomes:**
- Explain the fundamental concepts of databases, including data models, schemas, and DBMS architectures, and analyse the advantages of using a DBMS approach over traditional file processing systems.

Exercises/Projects:

- Draw the ER diagram for the online book store

Specific Resources: (web)

- Lucidchart - Database Design
- NPTEL videos :

https://www.youtube.com/playlist?list=PLIwC9bZ0rmjSkm1VRJROX4vP2YM If4Ebh

Unit – 2 : Structured Query Language (SQL)

(12Hrs)

Introduction – DDL - Naming rules and conventions – Data Types -Constraints- Creating a table- Displaying table information - Altering an existing table – Dropping, renaming, and truncating table.

- **Description:**

This unit delves into advanced topics in relational database theory, focusing on the fundamental operations of relational algebra and calculus.

- **Learning Outcomes:**

Apply advanced relational algebra and calculus operations to database queries and design, implement, and manage complex schemas and constraints using SQL.

Exercises/Projects:

- Create tables for the **Employee Management System**.**Specific Resources: (web)**

Resoure 1: https://nptel.ac.in/courses/106106093

Resource 2:

https://www.youtube.com/playlist?list=PL_c9BZzLwBRJ8f9-pSPbxSSG6lNgxQ4m9

Unit – 3 : Working with tables:

DML - Adding a new Row - Updating and deleting an existing rows/records - Retrieving datafrom

table - Arithmetic operations - Restricting data with WHERE clause. Functions and Grouping: Built-in functions - Grouping data. Joins and Views: Join - join types-Views: Views - Creating a view - Removing a view - Altering a view.

- **Description:**

This unit delves into unary and binary relational operations. It also covers SQL standards, providing an in-depth understanding of schema definition, constraints, queries, and views,as well as data manipulation through INSERT, DELETE, and UPDATE statements. The purpose is to equip learners with the knowledge to design, query, and manage relational databases effectively.

- **Learning Outcomes:**

Apply database queries on data manipulations using SQL

Exercises/Projects:

Create database for Retail Store Inventory Management

- Designing and Implementing the Database Operations:
- Adding a New Row: Insert a New Product
- Updating an Existing Row: Update the Quantity of a Product
- Deleting an Existing Row: Delete a Product
- Retrieving Data from Table: Retrieve All Products:
- Arithmetic Operations: Calculate Total Value of Products in Stock
- Built-in Functions and Grouping: Calculate the Average Price of Products:
- Group Sales Data by Product:
- Join Products and Sales to Retrieve Sales Information:
- Join Sales and Employees to Find Sales Made by Each Employee:
- Create a View to Show Product Sales Summary:
- Retrieve Data from the View:
- Alter the View to Include Total Sales Value:

Specific Resources: (web)

Resource 1: **https://www.youtube.com/playlist?list=PL_c9BZzLwBRJ8f9-pSPbxSSG6lNgxQ4m9**

Unit – 4 : PL/SQL: (12Hrs)

Fundamentals - Block structure - comments - Data types - Variable declaration -Assignment operation. Control Structures and Embedded SQL: Control structures - Nested blocks - SQL in PL/SQL - Data manipulation - Transaction control statements.

- **Description:**

This unit helps to understand the basics of programming and database management, laying the groundwork for more complex concepts.

- **Learning Outcomes:**

These concepts form the basis of PL/SQL programming, allowing you to write efficient and effective database applications.

Exercises/Projects

Customer Order Processing System

- Create a PL/SQL Block to Process an Order:
- Embedded SQL and Data Manipulation:
- Use SQL in PL/SQL
- Transaction Control Statements:

Specific Resources: (web)

Resource 1:

https://www.youtube.com/playlist?list=PLL_LQvNX4xKyiExzq9GKwORoH6nvaRnOQ

Unit – 5 : PL/SQL Cursors and Exceptions (15/12Hrs)

Cursors - Implicit & explicit cursors and attributes – cursor FOR loops - cursor with parameters - Cursor variables- Exceptions - Types of exceptions -Procedures -Functions – Triggers

Description:

This section covers the basic building blocks of PL/SQL programming, focusing on understanding block structure, comments, data types, variable declarations, and assignment operations. These fundamentals are essential for writing clear and efficient PL/SQL code.

Learning Outcomes:

Understand the structure and components of PL/SQL blocks.

Exercises/Projects:

Create database for Library Management System

- Cursors: Implicit Cursor Example
- Explicit Cursor Example:
- Cursor FOR Loop Example:
- Cursor with Parameters Example:
- Cursor Variables Example:
- Exceptions
- Creating and testing trigger

Specific Resources: (web)

https://www.youtube.com/playlist?list=PLL_LQvNX4xKyiExzq9GKwORoH6nvaRnOQ

Text Books:

4. Nilesh Shah. (2011). *Database Systems Using ORACLE* (2nd ed.). PHI

References:

1. Michael McLaughlin.(2014). Oracle Database 12c PL/SQL Programming, (1st ed.).McGraw Hill education

2. Abraham Silberschatz, Henry Korth, and S. Sudarshan. (2019.). Database System Concepts, (7th ed.). McGraw-Hill

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SEMESTER -END QUESTION PAPER STRUCTURE

Course Code & Title of the Course:	**23CGMAL232 Database Management Systems**
Offered to:	**B.Sc. Honours (Computer Science with Cognitive Systems)**
Category:	**SEMESTER: 3**
Max. Marks	**70**
Max.Time	**3 Hrs**

Section A: Short Answer Questions (20 Marks)Answer All questions. Each question carries 4 Marks.

1 (a) Define the following terms:
(i) Entity (ii) Entity set (iii) Attribute.(iv) Tuple (K1) 4M

OR

(b) What are the integrity rules of the relational model? (K1) 4M

2 (a) Describe the naming rules and conventions of SQL. (K2) 4M

OR

(b) List out data types of SQL with a brief description. (K2) 4M

3 (a) Explain about WHERE clause. (K2) 4M

OR

(b) How to add a record in to table? List various methods. (K2) 4M

4 (a)Explain the PL/SQL block structure.

OR

(b) Implement a cursor FOR LOOP with one example table. (K2) 4M

5 (a) Develop a function with your own example in PL/SQL. (K3) 4M

OR

(b) Develop a procedure with your own example in PL/SQL. (K3) 4M

Section B: Long Answer Questions (50 Marks) Answer All questions. Each question carries 10 Marks.

6 a) Explain about Normal forms with examples (K2) 10M

OR

(b) What are different types of keys? What is their use? (K1) 10M

7 (a) How to enforce different types of constraints on tables? ? (K2) 10M

OR

(b) Write a SQL query to create the emp, dept tables with required fields andconstraints and insert 5 records in each table in oracle.. (K2) 10M

8 (a) Give a brief description about joins and explain types of joins with examples. (K2)10M

OR

(b) What are the various types of functions available in Oracle? List and explain atleast 4 from each category. (k1) 10M

9 (a) Explain about the control structures in PL/SQL. (K2) 10M

OR

(b) How to manipulate (insert/update/delete) the data in PL/SQL? (K2)10M

10 (a) Differentiate between implicit and explicit cursors with examples. (K2) 10M

OR

(b) Explain about built in exceptions in Oracle. (K2) 10M

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Course Code				**23CGMAP232**			
Title of the Course				**Data Base Management Systems Lab**			
Offered to: (Programme/s)				**B.Sc. Honours (Computer Science with Cognitive Systems)**			
L	**0**	**T**	**0**	**P**	**2**	**C**	**1**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:		**Major**		**Course Relates to:**		**global**	
Year of Revision:				**Percentage:**			
Type of the Course:				**Employability**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				**Programming knowledge**			

Course Description:

The objective of course is to provide students with practical experience in database management using Oracle SQL and PL/SQL. Students will learn to create and manage database objects, perform data manipulation and retrieval, implement advanced querying techniques, and develop PL/SQL programs

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Introduce students to the foundational concepts and syntax of SQL
2	Equip students with the skills to design and manage relational databases
3	Develop students' ability to perform complex data retrieval and manipulation.
4	Provide comprehensive training in procedural programming using PL/SQL
5	Teach students how to manage errors and optimize database performance

Course Outcomes

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

CONO	COURSE OUTCOME	BTL	PO	PSO
CO1	Using DDL commands in Oracle, including creating, altering, and dropping tables	**K2**	**6, 7**	**1,2**
CO2	Performing data manipulation operations using DML commands	**K3**	**6, 7**	**1,2**
CO3	Understand and implement various types of joins	**K3**	**6, 7**	**1,2**
CO4	Write and execute basic PL/SQL programs	**K3**	**6, 7**	**1,2**
CO5	Use both implicit and explicit cursors in Oracle PL/SQL, execute triggers	**K3**	**6, 7**	**1,2**

CO-PO MATRIX									
CO NO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1						**2**	**3**	**2**	**2**
CO2						**3**	**2**	**2**	**3**
CO3					**3**	**2**	**3**	**3**	**2**

CO4						**3**	**3**	**2**	**3**
CO5						**3**	**3**	**3**	**3**

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of a Database management systems lab course, providinghands-on practice with Oracle technology

Unit 1: Implementing DDL commands in Oracle (6Hrs)

Lab 1:

Exercise 1: Creating Tables without Constraints

1. Create tables without applying any constraints to understand basic table creation.

Tasks:

- Create a table Employees with columns: Employee_ID, First_Name,Last_Name, Hire_Date, and Department.
- Create a table Projects with columns: Project_ID, Project_Name, andStart_Date.

2. Creating Tables with Primary Key and Foreign Key Constraints

Exercise 2:

Defining Tables with Primary and Foreign Keys

3. **Objective:** Learn to create tables with primary key and foreign key constraints toensure referential integrity.

4. **Tasks:**

3. Create a table Departments with columns: Department_ID and Department_Name, and apply a primary key constraint on Department_ID.

4. Create a table Employees with columns: Employee_ID, First_Name, Last_Name, Hire_Date, Department_ID, and apply a primary key constraint on Employee_ID. Add a foreign key constraint on Department_ID to referenceDepartments.

Lab 2:

Exercise 3: Creating Tables with Unique and Check Constraints

Objective: Create tables with unique and check constraints to enforce data uniqueness andvalid data values.

2. **Tasks:**

3. Create a table Products with columns: Product_ID, Product_Name, Price, andCategory. Apply a primary key constraint on Product_ID and a unique constraint on Product_Name.

4. Create a table Orders with columns: Order_ID, Order_Date, Product_ID, and Quantity. Apply a primary key constraint on Order_ID and a check constraintto ensure Quantity is greater than 0.

Exercise 4: Creating Tables with Composite Keys and Default Values

3. **Objective:** Create tables with composite primary keys and default values for columns.

4. **Tasks:**

- Create a table Order_Items with columns: Order_ID, Product_ID, Quantity,and Price. Apply a composite primary key constraint on Order_ID and Product_ID. Set default values for Quantity (1) and Price (0.00).
- Create a table Customer_Reviews with columns: Review_ID, Customer_ID, Review_Date, and Rating. Apply a primary key constraint on Review_ID andset a default value for Review_Date as the current date.

Exercise 5: Creating Tables with Referential Integrity Constraints

3. **Objective:** Create tables that enforce referential integrity between parent and childtables.

4. **Tasks:**

- Create a table Customers with columns: Customer_ID, Customer_Name, and Contact_Number, and apply a primary key constraint on Customer_ID.
- Create a table Invoices with columns: Invoice_ID, Customer_ID, Invoice_Date, and Amount. Apply a primary key constraint on Invoice_ID anda foreign key constraint on Customer_ID to reference Customers.

Unit 2: DML commands

Lab 3:

Exercise 6:

- Insert Data into emp and dept tables

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

	A	B	C	D	E	F	G	H
1	7839	KING	PRESIDENT		1981-11-1	5000		10
2	7698	BLAKE	MANAGEF	7839	1981-05-0	2850		30
3	7782	CLARK	MANAGEF	7839	1981-06-0	2450		10
4	7566	JONES	MANAGEF	7839	1981-04-0	2975		20
5	7788	SCOTT	ANALYST	7566	1982-12-0	3000		20
6	7902	FORD	ANALYST	7566	1981-12-0	3000		20
7	7369	SMITH	CLERK	7902	1980-12-1	800		20
8	7499	ALLEN	SALESMAI	7698	1981-02-2	1600	300	30
9	7521	WARD	SALESMAI	7698	1981-02-2	1250	500	30
10	7654	MARTIN	SALESMAI	7698	1981-09-2	1250	1400	30
11	7844	TURNER	SALESMAI	7698	1981-09-0	1500	0	30
12	7876	ADAMS	CLERK	7788	1983-01-1	1100		20
13	7900	JAMES	CLERK	7698	1981-12-0	950		30
14	7934	MILLER	CLERK	7782	1982-01-2	1300		10

https://livesql.oracle.com/apex/livesql/file/content_O5AEB2HE08PYEPTGCFLZU9YCV.ht ml

Lab 4: Queries

Exercise 7:

1. Display all the information of the EMP table?
2. Display unique Jobs from EMP table?
3. List the emps in the asc order of their Salaries?
4. List the details of the emps in asc order of the Dptnos and desc of Jobs?
5. Display all the unique job groups in the descending order?
6. Display all the details of all 'Mgrs'
7. List the emps who joined before 1981.
8. List the Empno, Ename, Sal, Daily sal of all emps in the asc order of Annsal
9. Display the Empno, Ename, job, Hiredate, Exp of all Mgrs
10. List the Empno, Ename, Sal, Exp of all emps working for Mgr 7369.
11. Display all the details of the emps whose Comm. Is more than their Sal.
12. List the emps in the asc order of Designations of those joined after the second half of1981.
13. List the emps along with their Exp and Daily Sal is more than Rs.100.
14. List the emps who are either 'CLERK' or 'ANALYST' in the Desc order.

Unit 3: Joins and views

Lab 5: joins

Exercise 8:

- List the total information of EMP table along with DNAME and Loc of all the empsWorking Under 'ACCOUNTING' & 'RESEARCH' in the asc Deptno.
- List the Empno, Ename, Sal, Dname of all the 'MGRS' and 'ANALYST' working inNew York, Dallas with an exp more than 7 years without receiving the Comm asc order of Loc.
- Display the Empno, Ename, Sal, Dname, Loc, Deptno, Job of all emps working at CJICAGO or working for ACCOUNTING dept with Ann Sal>28000, but the Sal should not be=3000 or 2800 who doesn't belongs to the Mgr and whose no is havinga digit '7' or '8' in 3rd position in the asc order of Deptno and desc order of job.
- Display the total information of the emps along with Grades in the asc order.

List all the Grade2 and Grade 3 emps Display all Grade 4,5 Analyst and Mgr.

- List the Empno, Ename, Sal, Dname, Grade, Exp, and Ann Sal of emps working forDept10 or20.

Lab 6: views

Exercise 9

Create a simple view to display specific columns from a table.

Task: Create a view named Employee_View that displays Employee_ID, First_Name, and Last_Name from the Employees table.

Create a view that joins multiple tables.

Task: Create a view named Employee_Department_View that displays Employee_ID,First_Name, Last_Name, and Department_Name by joining the Employees and Departments tables.

Create an updatable view that allows DML operations.

Task: Create a view named Updateable_Employee_View that displays Employee_ID,First_Name, and Last_Name and allows updates to the Last_Name column.

Create a view that is read-only and does not allow DML operations.

Task: Create a view named ReadOnly_Department_View that displays Department_IDand Department_Name.

Unit 4: PL/SQL blocks

Lab 7: basic PL/SQL programsExercise 10:

1. Write programs on Nested Blocks and Control Structures
2. Display Employee Details Using PL/SQL
3. Write a program to check the given number is prime or not.

Lab 8: procedures and functionsExercise 11:

1. Create a Procedure to Update Employee's Department
2. Call the Procedure
3. Create a Procedure to Checkout a Book
4. Create programs on Transaction Control Statements
5. Create a Function to Calculate Employee Tenure
6. Use the Function in a Query

Unit 5: cursors and triggers (6Hrs)

Lab 9: cursors

Exercise 12:

1. Create an explicit cursor to fetch and display all student names and their enrollmentdates.
2. Use a cursor FOR loop to process each student record and print details.
3. Define a cursor that takes a department number as a parameter and fetches theemployee details for that department.

Lab 10: Triggers and exceptions

Exercise 13:

7. Create a Trigger to Automatically Update Book Quantity When a Book is Returned
8. Create a Trigger to Update Last_Updated Column

9. Test the Trigger
10. Handle Exception for Division by Zero
11. Handle Exception for No Data Found
12. Create a user defined exception

References:

5. Nilesh Shah. (2011). *Database Systems Using ORACLE* (2nd ed.). PHI
6. https://www.youtube.com/playlist?list=PLL_LQvNX4xKyiExzq9GKwORoH6nvaRn OQ

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
(An autonomous college in the jurisdiction of Krishna University, Machilipatnam)

23CGMAP232 :Database Management Systems Lab

Offered to: B.Sc. Honours (Computer Science with Cognitive Systems) **Semester: III**
Max. Marks : 50 (CIA: 15 + SEE: 35) **Hrs/Week: 2**

Model Paper : Practicals

Time: 3 Hrs. **Max. Marks: 35**

Section – A

1. Experiment-1 15 M

2. Experiment-2 10 M

Section – B

Viva Voce 10 M

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Course Code				**23CGMAL233**			
Title of the Course				**Object Oriented Programming Using Java**			
Offered to: (Programme/s)				**B.Sc. Honours (Computer Science with Cognitive Systems)**			
L	**4**	**T**	**0**	**P**	**0**	**C**	**4**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:		**MAJOR**		**Course Relates to:**		**GLOBAL**	
Year of Introduction:		**2024**		**Percentage:**		**NA**	
Type of the Course:				**MAJOR**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				Knowledge in C Programming			

Course Description:

This course provides the fundamental components and libraries of the Java programming language, with a strong emphasis on object-oriented programming (OOP) principles. It constitutes as the foundation for Java development, providing the essential building blocks and features for creating robust and scalable applications.

Course Aims & Objectives:

S. No	COURSE OBJECTIVES
1	Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2	Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3	Understand the principles of inheritance and interfaces,arrays and string handling functions
4	Understand the Fundamental features of multi-threaded programs, Exception handling and packages.
5	Understand the principles of applets, I/O streams in java and java database connectivity

Course Outcomes:

At the end of the course, the student will / will be…

NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Understand the concept and underlying principles of Object- Oriented Programming ,Understand how object-oriented concepts are incorporated into the Java programming language	K2	6,7	1,2
CO2	Implement Object Oriented Programming Concepts(class, constructor, overloading) in java	K3	6,7	1,2
CO3	Use and create inheritance and interfaces in a Java program.	K3	5,6,7	1,2
CO4	Implement Multithreading, exception handling in Java.	K3	5,67	1,2
CO5	Use and create packages and interfaces in a Java program,Use graphical user interface in Java programs,Use of Input/outputStreams in java	K3	5,6,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO-PSO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						3	2	2	1
CO2						3	2	2	1
CO3					2	3	2	2	1
CO4					3	3	2	2	1
CO5					3	3	2	2	1

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure:

Unit – I: Introduction to Java Programming (12 Hrs.)

Introduction-Object Oriented paradigm-Basic Concepts of OOP-Benefits of OOP- Applications of OOP- Java features-Simple Java program structure-Java tokens-Java Statements-Implementing a Java Program-Java Virtual Machine-Command line arguments- Constants-Variables-Data Types-Declaration of Variables-Giving Value to Variables-Scopeof variables-Symbolic Constants-Type casting-Getting Value of Variables - types of operators with examples-expressions

Description:

This course is tailored to understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.

Examples:

1. Operators concept in java
2. Type casting in java

Exercises:

1. Develop a java program to display Fibonacci series.
2. Create a java program to find out the given number is palindrome or not \

Learning Outcomes:

By the end of the unit, students will understand the concept and underlying principles of Object-Oriented Programming and object-oriented concepts are incorporated into the Java programming language

Web Resources:

Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of Java Programming", 2018.
https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

Unit – II: Control statements, Classes, Objects and Methods (12 Hrs.)

Introduction-Decision making with if statement-Simple if statement-If Else statement- Nesting of if else statements-The else if ladder-The switch statement-The conditional operator-The While statement-The do-while statement-The for statement- Jumps in loops- Defining a class-Adding variables-Adding methods-Creating objects-Accessing class members-Constructors-Method overloading-Static members-Nesting of methods

Description:

This unit provides fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.

Examples:

1. Control statements in java
2. Constructors, Method overloading, Static keyword in java

Exercises:

1. Develop a java program to implement main method inside and outside of a class.

2.Construct a java program on Decision making.

Learning Outcomes:
By the end of this unit, students will be able to gain knowledge in Implementing Object Oriented Programming Concepts like class, constructor, overloading concepts in java
Web Resources:
Introduction to Classes and Objects in Java , Neso Academy, 7 june 2020
https://www.youtube.com/watch?v=W-D71ZeMixQ&list=PLBlnK6fEyqRiwWLbSXKFtdGV8OVqr9dZr

Unit – III: Inheritance, Arrays, Strings and Interfaces (12 Hrs.)

Extending a class-Overloading methods-Final variables and methods-Final classes-Abstract methods and classes-Arrays- One dimensional arrays- Creating an array – Two dimensional arrays-Strings- Wrapper classes
Multiple Inheritance: Introduction- Defining interfaces- Extending interfaces-Implementing interfaces-Assessing interface variables
Description:
This unit helps in understanding the principles of inheritance and interfaces, array creationand string handling functions
Examples:
3. Types of inheritances.
4. String handling functions and array creation in java
Exercises:
1. Construct a java program on single and Multi-dimensional array.
2. Develop java programs on various types of Inheritance.
Learning Outcomes:
By the end of this unit, students will be able to understand and implement inheritance and interfaces, array creation and string handling functions in a Java program.
Web Resources:
1. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Inheritance in Java",2018. https://www.youtube.com/watch?v=rxsl1TzcEgg
2. Arrays in Java by Neso Academy,2019 https://www.youtube.com/watch?v=kWJHzambtNo&list=PLBlnK6fEyqRiraym3T703apTvEZLaSVtJ
3. What is string in Java **by Lab Mug** ,2023 https://www.youtube.com/watch?v=Vv8ijzbz22s

Unit – IV: Multi-Threading, Exception Handling and Packages (12 Hrs.)

Introduction-Creating Threads-Extending the Threads-Stopping and Blocking a Thread-Lifecycle of a Thread-Using Thread Methods-Thread Exceptions-Thread Priority-Implementing the 'Runnable' Interface-Types of errors-Compile time errors-Run-time errors-Exceptions-Exception handling-Multiple Catch Statements-Using finally statement-Java API Packages-Creating Packages-Accessing a Package- Using a Package.
Description:
This unit helps in understanding and implementing multi-threaded programs, Exception handling and packages.
Examples:
3. Multi-threading in java
4. Types of exception handling mechanisms
Exercises:
1.Design java programs on Packages. 2.Construct a java program on Multi-Threading
Learning Outcomes:
By the end of this unit, students will be able to Implement Multithreading, exception handlingand packages in Java

Resources:

1. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Packages in Java", 2018.
https://www.youtube.com/watch?v=TwU3cv1FFis&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=17
2. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Exception Handling inJava", 2018.
https://www.youtube.com/watch?v=vUov8EkjZjU&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=23
3. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Multi Threading inJava", 2018.
https://www.youtube.com/watch?v=6rYOyIGfy3w&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=27

Unit – V: Applets and I/O Files (12 Hrs.)

Local and remote applets-Applets and Applications-Building Applet code- Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state-Concept of Streams-Stream classes-Byte Stream Classes-Character Stream classes: Reader stream classes, Writer Stream classes-Reading and writing files.

Description:

This unit focuses Understanding the principles of applets, I/O streams in java

Examples:

4. Applet creation
5. Writing and Reading Files.

Exercises:

1. Construct an Applet program to draw a Line, Rectangle, Circle, Ellipse, Arcs and a Polygon.
2. Develop a java program to perform writing Data in a file and reading data from a file.

Learning Outcomes:

By the end of this unit, students will be able to implement graphical user interface in Java programs, Input/output Streams in java and java database connectivity with oracle

Resources:

1. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Applet Programming inJava", 2018.
https://www.youtube.com/watch?v=cC_Ij7WmP_k&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=34
2. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur." JDBC", 2018.
https://www.youtube.com/watch?v=ajhWv31oN1k&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=50
3. "File Handling in Java", Learn Coding, 2021.
https://www.youtube.com/watch?v=VJgCjLuU4e8&list=PLqleLpAMfxGDVu5tUmUg9jSQUUB8_5DB0

Specific Resources:

Text Books:

1. E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-HillCompany.

Reference Books:

2. Programming in Java by Sachin Malhotra, OXFORD University Press John R. Hubbard,

3Programming with Java, Second Edition, Schaum's outline Series,TATA McGraw-Hill Company. Deitel &Deitel. Java TM: How to Program, PHI (2007)

4. Java Programming: From Problem Analysis to Program Design- D.S Mallik
5. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press(2008)

Web Resources:

Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of JavaProgramming", 2018. https://www.youtube.com/watch?v=OjdT2l- EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
(An autonomous college in the jurisdiction of Krishna University, Machilipatnam)
Object Oriented Programming
Using Java SEMESTER -END QUESTION
PAPER STRUCTURE

Course Code & Title of the Course:	**23CGMAL233 Object Oriented Programming Using Java**
Offered to:	**B.Sc. Honours (Computer Science with Cognitive Systems)**
Category:	**SEMESTER: 3**
Max. Marks	**70**
Max.Time	**3 Hrs**

Section A: Short Answer Questions (20 Marks) Answer All questions. Each question carries 4 Marks.

1. (a) Discuss about structure of java program.K2
   OR
   (b) Discuss about data types in java.K2

2. (a) Explain class creation with methods, variables and create objects for it. K2
   OR
   (b)Explain constructors in java with example. K2
3. (a) Illustrate any five string handling methods in java.K3
   OR
   (b)Illustrate implementing interfaces in java with example. K3
4. (a) Describe creating threads in java with an example.K2
   OR
   (b)Describe package creation and accessing with example.K2
5. (a) Explain byte stream classes in java. K2
   OR
   (b) Explain with program applet creation.K2

Section B: Long Answer Questions (50 Marks) Answer All questions. Each question carries 10 Marks.

6. (a) Discuss Object Oriented Programming Principles.K2
   (OR)
   (b)Discuss Java Buzz words. K2
7. (a) Describe Method Overloading with an example program.K2
   (OR)
   (b)Describe the concept of static members in java with example.K2
8. (a) Explain the concept of final keyword with examples.K2
   (OR)
   (b)List of different types of inheritance in java and explain with examples.K2
9. (a) Explain life cycle of a thread with neat diagram. K2
   (OR)
   (b) Define Exception. Explain Exception handling mechanism in java with examplesK2
10. (a) Explain life cycle of applet with neat diagram. K2
    (OR)
    (b) Explain writing and reading files in java.K2

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Course Code				**23CGMAP233**			
Title of the Course				**Object Oriented Programming using Java Lab**			
Offered to: (Programme/s)				**B.Sc. Honours (Computer Science with Cognitive Systems)**			
L	**0**	**T**	**0**	**P**	**2**	**C**	**1**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:		**Major**		**Course Relates to:**		**global**	
Year of Revision:				**Percentage:**			
Type of the Course:				**Employability**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				**Programming knowledge**			

Course Description:

The objective of course is to provide students with practical experience in Object Oriented Programming in Java.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Undestanding fundamental concepts in java
2	Understanding fundamentals of programming such as variables, conditional and iterative execution, statements, etc
3	Understanding arrays, inheritance, packages and multi-threading
4	Understanding Exception handling mechanisms and Applet Programming.
5	Understand the Files concept in java

Course Outcomes

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

CONO	COURSE OUTCOME	BTL	PO	PSO
CO1	Creating java programs that covers fundamental concepts	**K6**	**6,7**	**1,2**
CO2	Creating control statements in java.	**K6**	**6,7**	**1,2**
CO3	Creating different types of inheritance and interfaces, arrays, multithreading and packages in java	**K6**	**5,6,7**	**1,2**
CO4	Creating different types of exception handling mechanisms and applets in Java.	**K6**	**5,6,7**	**1,2**
CO5	Creating files in Java program.	**K6**	**5,6,7**	**1,2**

CO-PO MATRIX									
CO NO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1						**3**	**2**	**2**	**1**
CO2						**3**	**2**	**2**	**1**
CO3					**2**	**3**	**2**	**2**	**1**

CO4					**3**	**3**	**2**	**2**	**1**
CO5					**3**	**3**	**2**	**2**	**1**

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of Object Oriented Programming in Java Lab course,providing hands-on practice

LAB LIST

Unit – I: Introduction to Java Programming Lab 1

1. Design a java program to print Hello World.
2. Develop a java program on Variables.

Lab 2

3. Develop a java program to use various Data types.
4. Construct java program on Operators

Lab 3

5. Develop a java program to display Fibonacci series.
6. Create a java program to find out the given number is palindrome or not.

Unit – II: Control statements, Classes, Objects and Methods Lab 4

7. Develop a java program to implement main method inside and outside of a class.
8. Construct a java program on Decision making.

Lab 5

9. Construct a java program on Looping.
10. Design a java program on Statements.

Unit – III: Inheritance, Arrays, Strings and Interfaces

Lab 6

11. Construct a java program on single and Multi-dimensional array.
12. Write a java program on Strings.

Lab 7

13. Develop a java program on interface.
14. Develop java programs on various types of Inheritance.

Unit – IV: Multi-Threading, Exception Handling and Packages Lab 8

15. Design java programs on Packages.
16. Construct a java program on Multi-Threading.

Lab 9

17. Write java programs on various types Exceptions.
18. Design a program to demonstrate Catch Blocks.

Unit – V: Applets, Streams and Files

Lab 10

19. Construct an Applet program to draw a Line, Rectangle, Circle, Ellipse, Arcs and aPolygon.
20. Develop a java program to perform writing Data in a file and reading data from a file.

Reference: https://www.atnyla.com/overview-of-java-language/0/2

Web Resources:

Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of Java Programming", 2018.
https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

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(An autonomous college in the jurisdiction of Krishna University, Machilipatnam)

22CGMAP233 : **Object Oriented Programming Using Java Lab**
Offered to: B.Sc. Honours (Computer Science with Cognitive Systems)

Semester: III
Max. Marks : 50 (CIA: 15 + SEE: 35) **Hrs/Week: 2**

Model Paper : Practicals

Time: 3 Hrs. **Max. Marks: 35**

Section – A

1.	Experiment-1	15 M
2.	Experiment-2	10 M

Section – B

Viva Voce 10 M

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SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
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Course Code				**23CGMAL234**			
Title of the Course				**COMPUTER NETWORKS**			
Offered to: (Programme/s)				**B.Sc. Honours (Computer Science with Cognitive Systems)**			
L	**4**	**T**	**0**	**P**	**0**	**C**	**4**
Year of Introduction:	**2024-25**			**Semester:**			**3**
Course Category:	**MAJOR**			**Course Relates to:**	**GLOBAL**		
Year of Introduction:	**2024**			**Percentage:**	**NA**		
Type of the Course:				**Employability**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				**Computer Fundamentals**			

Course Code: Computer Networks
Course Category: Minor 1
3L 0T 2P 4CPre – requisite: Computer Fundamentals
Course Description:
This course provides students with an exploration of fundamental computer network concepts, including hardware, software, transmission media, addressing, and routing. It covers essential technologies and protocols necessary for effective comprehension and management of modern computer networks.
Course Aims & Objectives:

S. No	COURSE OBJECTIVES
1	Equip students with a thorough understanding of computer network concepts apartfrom developing comprehensive understanding of network architecture and protocols by providing hands on experience on Cisco Packet tracer software.
2	Ensure that students possess the ability to analyse network protocols, topologies and characteristics of various categories of transmission media.
3	Provide students with a foundational proficiency in IP addressing and understand the role of switches in network management.
4	Develop in students a robust comprehension of spanning tree protocol and explore network routing techniques.
5	Enable students to define the need of network monitoring and implementing WLAN standards apart from handling IP ACLs.

Course Outcomes:
At the end of the course, the student will / will be…

CONO	COURSE OUTCOME	BTL	PO	PSO
CO1	Understand the practical applications and differences of various networks along with protocol hierarchies apart from comparing OSI and TCP/IP reference models.	K2	**5,6,7**	**1,2**
CO2	Comprehend network protocols and topologies apart from identifying and analysing transmission media	K2	**5,6,7**	**1,2**
CO3	Utilize Cisco Packet Tracer to simulate and demonstrate routing algorithms and protocols effectively.	K3	**5,6,7**	**1,2**
CO4	Evaluate and analyse advanced routing protocols.	K4	**5,6,7**	**1,2**

CO5	Comprehend the purpose and management of IP ACLs apart from configuring and managing NAT.	K2	5,6,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO-PSO MATRIX									
CO NO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1					**1**	**2**	**3**	**2**	**1**
CO2					**1**	**3**	**3**	**3**	**1**
CO3					**1**	**3**	**3**	**3**	**1**
CO4					**1**	**3**	**3**	**3**	**1**
CO5					**1**	**3**	**3**	**3**	**1**

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure:

Unit – I: Introduction to Computer Networks (15 Hrs.)

1.1 Introduction: **Network classifications:** LAN, MAN, WAN

1.2 **Data and signals:** analog and digital, periodic analog signals, digital signals, bit rate, baud rate, bandwidth

1.3 **Transmission impairments:** attenuation, distortion and noise

1.4 **Network models**: OSI model layers and their functions, TCP/IP protocol suite.

Description:

This course is tailored to provide a structured overview of the networking fundamentals, equipping students with the necessary knowledge to understand and work with various network types and models.

Examples/Applications/Case Studies:

1. Installation of Cisco Packet Tracer Software.
2. Study of basic network commands and network configurations.

Exercises:

1. Install Cisco packet tracer and perform networking operations.

Learning Outcomes:

By the end of the unit, students will have a comprehensive understanding of computer network fundamentals and hands-on experience with Cisco Packet Tracer for performing network operations.

Web Resources:

1. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai."Download Cisco Packet Tracer – step – by – step instructions", 2022. https://www.youtube.com/watch?v=yjLTPBingE&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf

2. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai."Introduction to Cisco Packet Tracer", 2022. https://www.youtube.com/watch?v=oM8w0swQFaE&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=2

3. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai, "Create a simple LAN connection". https://www.youtube.com/watch?v=7WBO8aQiK9A&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=4

4. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology ,

Chennai,"Create a simple LAN connection with ping command".
https://www.youtube.com/watch?v=LNSu-Xqrjds&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=5

Unit – II: Transmission Media (15 Hrs.)

2.1 **Network Basics** - Protocols, Topology

2.2 **Multiplexing:** FDM, TDM- Spread spectrum - Frequency hopping spread spectrum,Direct sequence spread spectrum,

2.3 **Transmission media**: guided and unguided media

2.4 **Communication Satellites:** Geostationary, Medium-Earth Orbit, Low Earth-orbit Satellites.

Description:

This unit provides an in-depth understanding of the fundamental components and configurations of computer networks. Students will explore various network protocols, topologies, and the different types of transmission media used in networking. The course covers both guided transmission media, and unguided transmission methods. Additionally, the unit examines the role and types of communication satellites, including geostationary, medium-Earth orbit, and low Earth-orbit satellites.

Examples:

1. Creating simple network connection using different transmission media in Cisco PacketTracer.
2. Demonstrate network topologies using Cisco Packet Tracer

Exercises:

1. Creating and connecting networks using Cisco Packet Tracer.
2. Demonstrate creating network topologies.

Learning Outcomes:

By the end of this unit, students will be able to gain knowledge in network topologies and types of transmission media apart from hand – on experience in creating LAN connections using Cisco packet tracer..

Web Resources:

1. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai, Creating simple network connection using different transmission media in Cisco Packet Tracer.
https://www.youtube.com/watch?v=TB4kUZ9nrok&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=8
2. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai, "Types of Topologies – Demonstrating Bus Topology using Cisco Packet Tracer".
https://www.youtube.com/watch?v=RmDxQqr2h1I&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=13

Unit – III: IP Addressing and Switches (15 Hrs.)

3.1 **IP Addressing Version 4:** purpose, hierarchy, Private IP Address

3.2 **IP Addressing Version 6:** Benefits, Notation, configuration, migrating to IPV6

3.3 **Subnetting:** basics, IP address class and subnet mask, VLSMs

3.4 **Layer 2 Switches:** features, types

3.5 **Controlling network traffic with Cisco Switches:** deciding fate of frames, Switchingbetween Half and full duplex

Description:

This unit delves into advanced concepts of IP addressing, focusing on both IPv4 and IPv6, and provides a comprehensive understanding of subnetting and network traffic control using Cisco

switches. The unit also covers the basics of subnetting, including IP address classes, subnet masks, and Variable Length Subnet Masks (VLSMs). Additionally, students will explore the purpose and functions of Layer 2 switches and gain hands-on experience in managing and controlling network traffic with Cisco switches.

Examples:

5. Perform initial switch configuration.
6. Demonstrate switch basic commands.

Exercises:

3. Demonstrate connecting LAN using switches.
4. Perform operations on switches

Learning Outcomes:

By the end of this unit, students will be able to understand the role of switches in computer network and differentiate IPV4 and IPV6 addressing versions.

Web Resources:

1. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology ,Chennai, "Differentiate Hub and switch".
https://www.youtube.com/watch?v=zZS3tYGtx3o&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=9

Unit – IV: Network Routing (15 Hrs.)

4.1 **Spanning tree protocol:** operation flow

4.2 **VLAN**: benefits, managing and identifying, VLAN trunking

4.3 **Network Routing protocols:**-introduction, Routing Information Protocol(RIP)-Enhancedinterior gateway routing protocol(EIGRP)-Open shortest path first protocol expansion(OSPF)

Description:

This unit covers advanced networking protocols and routing techniques essential for managing complex networks. Students will learn about the Spanning Tree Protocol (STP) and its operation, the benefits and management of VLANs, and VLAN trunking. The unit also delves into network routing, exploring various routing protocols used in routing.

Examples:

5. Performing an Initial Router Configuration.
6. Demonstrate static and dynamic routing

Exercises:

Demonstrate Dynamic Routing protocols like

1. OSPF.
2. RIP
3. EIGRP.

Learning Outcomes:

By the end of this unit, students will be able to Apply Python function, classes and modules to solve engineering problems.

Resources:

1. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai,"Differentiate bridges and router".
https://www.youtube.com/watch?v=83_07EDibus&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=10

2. Otom Gurutech Trainer, Kenya, 2023, "How to Configure RIP, EIGRP and OSPF usingCisco Packet Tracer".
https://www.youtube.com/watch?v=ggCmnt7cD_g

Unit – V: Monitoring Networks (15 Hrs.)

5.1 **Monitoring Networks:** purpose, going over Air, locally and globally Devices-SharingAirwaves, Modulating the Airwaves

5.2 WLAN Standards

5.3 **IP Access Lists (IP ACLs):** features, types, rules, advantages

5.4 **NAT:** purpose, Operational flow, Configuring and managing NAT

Description:

This unit focuses on the techniques and tools for monitoring networks, the standards and operation modes of Wireless Local Area Networks (WLANs), and the implementation of IP Access Lists (IP ACLs) and Network Address Translation (NAT)..

Examples:

31. Handling IP ACL.
32. Configuring and managing NAT.

Exercises:

1. Configure SNAT using Cisco Packet Tracer.
2. Router Access Control List using Cisco Packet Tracer.

Learning Outcomes:

By the end of this unit, students will be able to handle ACL, configure and manage SNAT.

Resources:

1. Ramalingam Murugan, Vellore Institute of Technology, " Cisco Packet Tracer – SNAT", https://www.youtube.com/watch?v=p-t2qUNwFec
2. Er Sital Mandal, "Router Access Control List using Cisco Packet Tracer", 2021. https://www.youtube.com/watch?v=zH8MxRCBRko

Specific Resources:

Text Books

1. David J.Wetherall, Andrew S.Tanenbaum, "Computer Networks", 5th Edition, Pearson Education, 2012.
2. Behrouz A. Forouzan, "Data Communication and Networking", 4th Edition, Tata McGrawHill, 2007.

References:

1. Andrew S. Tanenbaum, Nick Feamster, David J. Wetherall, "Computer Networks", 6th Edition, Pearson Education, 2022.

Web Resources:

1. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai."Download Cisco PacketTracer – step – by – step instructions",2022. https://www.youtube.com/watch?v=yjLTPBingE&list=PLnpr13oHoA7bF7yQTjMHB4 mb8BtvGYyzf
2. DigiDev, Cisco Packet Tracer for Beginers, https://www.youtube.com/watch?v=ty0HMs48U1k

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COMPUTER NETWORK SEMESTER -END QUESTION PAPER STRUCTURE

Course Code & Title of the Course:	**23CGMAL234 Computer Networks**
Offered to:	**B.Sc. Honours (Computer Science with Cognitive Systems)**
Category:	**SEMESTER: 3**
Max. Marks	**70**
Max.Time	**3 Hrs**

Section A: Short Answer Questions (20 Marks)

Answer All questions. Each question carries 4 Marks.

1. (a) Explain about LAN with an example. K2 4M

OR

(b) Classify between analog and digital signals. K1

2. (a) Define Spread spectrum. K1

OR

(b) Explain types of Multiplexing. K2

3. (a) Explain about IP addressing.K2

OR

(b) Explain about Subnetting. K2

4. (a) Define routing. K1

OR

(b) Write a note on VLAN.K1

5. (a) Explain about ACL.K2

OR

(b) Describe WLANs.K2

Section B: Long Answer Questions (50 Marks)

Answer All questions. Each question carries 10 Marks.

6. (a) Classify types of Networks.K3

OR

(b) Classify various OSI Reference Model. K3

7. (a) Summarize guided Transmission media..K3

OR

(b) Explain about various Communication Satellites in detail. K2

8. (a) Explain about IPV4 and to use it. K2

OR

(b) Explain about IPV6 and compare it with IPV4. K2

9. (a) Configure the OSPF Protocol with an example.K4

OR

(b) Configure the Routing Information Protocol with an example.K4

10. (a) What is NAT and how does it works. K1

OR

(b) Explain how to Monitor Networks. K2

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Course Code				**23CGMAP234**			
Title of the Course				**COMPUTER NETWORKS LAB**			
Offered to: (Programme/s)				**B.Sc. Honours (Computer Science with Cognitive Systems)**			
L	**4**	**T**	**0**	**P**	**0**	**C**	**4**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:		**MAJOR**		**Course Relates to:**		**GLOBAL**	
Year of Introduction:		**2024**		**Percentage:**		**NA**	
Type of the Course:				**Employability**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				**Computer Fundamentals**			

Course Category: Minor 1 **3L**

0T 2P 4CPre – requisite: Computer Fundamentals

Course Description:

This course provides students with an exploration of fundamental computer network concepts, including hardware, software, transmission media, addressing, and routing. It covers essential technologies and protocols necessary for effective comprehension and management of modern computer networks.

Course Aims & Objectives:

S. No	COURSE OBJECTIVES
1	Equip students with a thorough understanding of computer network concepts apartfrom developing comprehensive understanding of network architecture and protocols by providing hands on experience on Cisco Packet tracer software.
2	Ensure that students possess the ability to analyse network protocols, topologies and characteristics of various categories of transmission media.
3	Provide students with a foundational proficiency in IP addressing and understand the role of switches in network management.
4	Develop in students a robust comprehension of spanning tree protocol and explore network routing techniques.
5	Enable students to define the need of network monitoring and implementing WLAN standards apart from handling IP ACLs.

Course Outcomes:

At the end of the course, the student will / will be…

CONO	COURSE OUTCOME	BTL	PO	PSO
CO1	Understand the practical applications for basic network commands and network configurations by installing Cisco packet Tracer.	K2	5,6,7	1,2
CO2	Comprehend network protocols and topologies apart from identifying and analysing transmission media	K2	5,6,7	1,2
CO3	Utilize Cisco Packet Tracer to simulate and demonstrate routing algorithms and protocols effectively.	K3	5,6,7	1,2
CO4	Evaluate and analyse advanced routing protocols.	K4	5,6,7	1,2
CO5	Comprehend the purpose and management of IP ACLs apart from configuring and managing NAT.	K2	5,6,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO-PSO MATRIX									
CO NO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1					**1**	**2**	**3**	**2**	**1**
CO2					**1**	**3**	**3**	**3**	**1**
CO3					**1**	**3**	**3**	**3**	**1**
CO4					**1**	**3**	**3**	**3**	**1**
CO5					**1**	**3**	**3**	**3**	**1**

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSOrespectively

Course Structure:

Unit – I: Introduction to Computer Networks (15 Hrs.)

Description:

This course is tailored to provide a structured overview of the networking fundamentals, equipping students with the necessary knowledge to understand and work with various network types and models.

Exercises:

2. Install Cisco packet tracer and perform networking operations.
3. Basic network commands and network configurations.

Learning Outcomes:

By the end of the unit, students will have a comprehensive understanding of computer network fundamentals and hands-on experience with Cisco Packet Tracer for performing network operations.

Web Resources:

5. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai."Download Cisco Packet Tracer – step – by – step instructions", 2022. https://www.youtube.com/watch?v=yjLTPBingE&list=PLnpr13oHoA7bF7yQTjMHB4 mb8BtvGYyzf

6. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai."Introduction to Cisco Packet Tracer", 2022. https://www.youtube.com/watch?v=oM8w0swQFaE&list=PLnpr13oHoA7bF7yQTjMH B4mb8BtvGYyzf&index=2

7. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai, "Create a simple LAN connection". https://www.youtube.com/watch?v=7WBO8aQiK9A&list=PLnpr13oHoA7bF7yQTjMH B4mb8BtvGYyzf&index=4

8. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai,"Create a simple LAN connection with ping command". https://www.youtube.com/watch?v=LNSu-Xqrjds&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=5

Unit – II: Transmission Media (15 Hrs.)

Description:

This unit provides an in-depth understanding of the fundamental components and configurations of computer networks. Students will explore various network protocols, topologies, and the different types of transmission media used in networking. The course covers both guided

transmission media, and unguided transmission methods. Additionally,the unit examines the role and types of communication satellites, including geostationary, medium-Earth orbit, and low Earth-orbit satellites.

Exercises:

3. Creating and connecting networks using Cisco Packet Tracer.
4. Demonstrate creating network topologies.

Learning Outcomes:

By the end of this unit, students will be able to gain knowledge in network topologies and types of transmission media apart from hand – on experience in creating LAN connections using Cisco packet tracer..

Web Resources:

3. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai, Creating simple network connection using different transmission media in Cisco Packet Tracer. https://www.youtube.com/watch?v=TB4kUZ9nrok&list=PLnpr13oHoA7bF7yQTjMH B4mb8BtvGYyzf&index=8
4. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai, "Types of Topologies – Demonstrating Bus Topology using Cisco Packet Tracer". https://www.youtube.com/watch?v=RmDxQqr2h1I&list=PLnpr13oHoA7bF7yQTjMH B4mb8BtvGYyzf&index=13

Unit – III: IP Addressing and Switches (15 Hrs.)

Description:

This unit delves into advanced concepts of IP addressing, focusing on both IPv4 and IPv6, and provides a comprehensive understanding of subnetting and network traffic control using Cisco switches. The unit also covers the basics of subnetting, including IP address classes, subnet masks, and Variable Length Subnet Masks (VLSMs). Additionally, students will explore the purpose and functions of Layer 2 switches and gain hands-on experience in managing and controlling network traffic with Cisco switches.

Exercises:

5. Demonstrate connecting LAN using switches.
6. Perform operations on switches

Learning Outcomes:

By the end of this unit, students will be able to understand the role of switches in computer network and differentiate IPV4 and IPV6 addressing versions.

Web Resources:

2. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology ,Chennai, "Differentiate Hub and switch". https://www.youtube.com/watch?v=zZS3tYGtx3o&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=9

Unit – IV: Network Routing (15 Hrs.)

Description:

This unit covers advanced networking protocols and routing techniques essential for managing complex networks. Students will learn about the Spanning Tree Protocol (STP) and its operation, the benefits and management of VLANs, and VLAN trunking. The unit also delves into network routing, exploring various routing protocols used in routing.

Exercises:

1. Performing an Initial Router Configuration.
2. Demonstrate Dynamic Routing protocols like

1. OSPF.
2. RIP
3. EIGRP.

Learning Outcomes:

By the end of this unit, students will be able to Apply Python function, classes and modules to solve engineering problems.

Resources:

1. Otom Gurutech Trainer, Kenya, 2023, "How to Configure RIP, EIGRP and OSPF usingCisco Packet Tracer". https://www.youtube.com/watch?v=ggCmnt7cD_g

Unit – V: Monitoring Networks (15 Hrs.)

Description:

This unit focuses on the techniques and tools for monitoring networks, the standards and operation modes of Wireless Local Area Networks (WLANs), and the implementation of IP Access Lists (IP ACLs) and Network Address Translation (NAT).

Exercises:

3. Configure SNAT using Cisco Packet Tracer.
4. Router Access Control List using Cisco Packet Tracer.

Learning Outcomes:

By the end of this unit, students will be able to handle ACL, configure and manage SNAT.

Resources:

3. Ramalingam Murugan, Vellore Institute of Technology, " Cisco Packet Tracer –SNAT", https://www.youtube.com/watch?v=p-t2qUNwFec
4. Er Sital Mandal, "Router Access Control List using Cisco Packet Tracer", 2021.https://www.youtube.com/watch?v=zH8MxRCBRko

Web Resources:

3. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai."Download Cisco Packet Tracer – step – by – step instructions", 2022. https://www.youtube.com/watch?v=yjLTPBingE&list=PLnpr13oHoA7bF7yQTjMHB4 mb8BtvGYyzf
4. DigiDev, Cisco Packet Tracer for Beginers, https://www.youtube.com/watch?v=ty0HMs48U1k
3. Free Online Courses for Cisco Packet Tracer
   - Getting Started with Cisco Packet Tracer
   - Exploring Networking with Cisco Packet Tracer
   - Introduction to Packet Tracer Exam

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22CGMAP234 **:** Computer NetworksLab

Offered to: B.Sc. Honours (Computer Science with Cognitive Systems)

Semester: V

Max. Marks : 50 (CIA: 15 + SEE: 35) **Hrs/Week: 2**

Model Paper : Practicals

Time: 3 Hrs. **Max. Marks: 35**

Section – A

1. Experiment-1 15 M

2. Experiment-2 10 M

Section – B

Viva Voce 10 M

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Course Code				**23CAMAL231**			
Title of the Course				**E Commerce and Web Designing**			
Offered to: (Programme/s)				**B.Com Honours Computer Applications Sec A & B**			
L	**4**	**T**	**0**	**P**	**2**	**C**	**4**
Year of Introduction:	**2024-25**			**Semester:**			**3**
Course Category:	**MAJOR**			**Course Relates to:**		**Global/ National/ Regional/Local**	
Year of Revision:	**2024**			**Percentage:**		**NA**	
Type of the Course:				**CORE**			
Crosscutting Issues of the Course:							
Pre-requisites, if any							

Course Description:

The Objective of E-Commerce revolve around leveraging digital platforms to achieve various business goals. Here are some key objectives. E-commerce aims to boost sales by providing a convenient and accessible platform for customers to browse, choose, and purchase products or services online. The objective is to overcome geographical limitations and reach a global audience. E-commerce allows businesses to transcend borders and cater to customers worldwide.
E-commerce seeks to reduce operational costs associated with traditional brick-and- mortar stores, such as rent, utilities, and staffing. It aims for efficient and streamlined processes. E-commerce platforms are designed to operate 24/7, providing customers with the flexibility to shop at any time. The goal is to eliminate time constraints and cater to diverse time zones.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Acquire basic knowledge of fundamental concept of E-commerce & Web Designing.
2	Impact the basic concepts of B2c-Business, B2c Software Systems.
3	Understand the concepts Foundations of Risk Management, Compliance Management.
4	Understand about Introduction to Web Programming.
5	Understand about Introduction to CSS Overview

Course Outcomes

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

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Gain the knowledge in-depth training in use of E-commerce & Web Designing.	**K1**	**5**	**1**
CO2	Understand the concepts of B2c-Business, B2c Software Systems.	**K2**	**5**	**1**
CO3	Understand the acquire basic knowledge in the Risk Management, Compliance Management.	**K2**	**5**	**1**
CO4	Apply the Web Programming, especially HTML	**K3**	**5**	**1**
CO5	Analysing the concepts of CSS overview and CSS rules.	**K4**	**6**	**1**

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1					1	2	3	1	
CO2					1	2	3	1	
CO3					1	2	3	1	
CO4					1	2	3	1	
CO5					1	2	3	1	

Course

Structure:

Unit – 1: [Basics and Definitions] (12Hrs)

Definition, E-Commerce with 5-C Model, Additional Terms, Business Models Related to E-Commerce. Advantages and Disadvantages, Web 2.0, Technical and Economic Challenges. Frameworks and Architectures: Actors and Stakeholders, Fundamental Sales Process and His7+1 Process Steps Work, Technological Elements, Typical Applications.

Description: E-commerce, or electronic commerce, refers to the buying and selling of goods and services over the internet. It encompasses a wide range of online business activities, including.

Learning Outcome: The student should learn E-Commerce with 5-C Model.

Example: Amazon is one of the largest and most well-known e-commerce platforms in the world. It provides a vast marketplace where consumers can purchase a wide range of products, from books and electronics to clothing and household goods.

Exercise 1: Create a web page to display a hyperlink which when clicked directs you toAmazon website.

Exercise 2: Create a web page to demonstrate your college name aligned with the logo ofyour college.

Exercise 3: Create a web page to demonstrate definition lists taking various applications ofecommerce as an example.

Web links:

https://onlinecourses.swayam2.ac.in/nou21_cm14/preview

Unit – 2: B2C Business: (12Hrs)

B2c Basics, B2c-Business and CRM, B2c Software Systems, Customer Relationship Management (CRM) B2B Business: B2b Basics, Differences Between B2b And B2c, B2b Software Systems. Supply Chain Management.

Description B2C, or Business-to-Consumer, refers to the transactions and interactions that occur directly between businesses and individual consumers. In a B2C model, companies sell products or services directly to end-users rather than to other businesses. This is the most common model for retail, e-commerce, and various service industries.

Learning Outcome: The student should learn B2c-Business and CRM, B2c Software Systems.

Example: A real-time example of a B2C (Business-to-Consumer) business is Apple. Apple sells its products, such as iPhones, iPads, MacBooks, and accessories, directly to consumers through its physical Apple

Stores and its online Apple Store.

Exercise 1: Create a web page which asks for mode of payment which includes the options: Credit card/Debit card/Online transfer (use radio buttons)

Exercise 2: Create a web page which asks the user to enter his credit card details. Use textboxes, drop down buttons.

Exercise 3: Create a web page to display definition list which defines the terms: B2B, B2C, C2B, C2C.

Web links: https://onlinecourses.swayam2.ac.in/nou21_cm14/preview

Unit – 3: Security & Compliance Management: Foundations of Risk Management,Compliance Management, Information Security Management (Ism), Technology.

Electronic Payment: Business and Money, the Payment Challenge,, ReceivablesManagement, Cyber Money.

Description: Refers to the processes and technologies that organizations use to protect their information systems and ensure adherence to regulatory and industry standards. this encompasses a broad range of activities designed to safeguard data, maintainsystem integrity, and manage risk.

Learning Outcome: The student should learn Risk Management, Compliance Management,Information Security Management (Ism), Technology.

Example: Security and compliance management is Microsoft Azure Security Center.

Exercise 1: Create a web page which displays four buttons containing text B2B, B2C, C2B, C2C. Also, when a button is clicked details about the clicked subject should appear on a separate page.

Exercise 2: Create a web page which asks for mode of payment which includes the options: Credit card/Debit card/Online transfer (use radio buttons).

Exercise 3: Create a web page to scroll the text "E-Commerce" for exactly 5 times from leftto right of the screen.

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Web links: https://onlinecourses.swayam2.ac.in/nou21_cm14/preview

Unit 4: Introduction to Web Programming: Introduction, creating website, (12Hrs) HTML tags, HTML Elements, HTML attributes, CSS Preview, History of HTML, Differencesbetween old HTML and HTML5, how to check your HTML code

Coding Standards, Block Elements:

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

Text Elements, and Character References: sup, sub, s, mark, and small Elements,

strong,em, b, u, and i Elements, span Element, Character References, Web Page with Character References, and Phrasing Elements.

Description: The foundational concepts and technologies used to create and manage websites and web applications. This field involves a combination of languages, tools, and practices that enable developers to build interactive and dynamic web experiences.

Learning Outcome: The student should learn Risk Management, Compliance Management,Information Security Management (Ism), Technology.

Example: An introduction to web programming could be creating a simple personal portfolio website.

Exercise 1: Create a web page to insert an image which when clicked redirects you to your college website.

Exercise 2: Create a web page to display the name of your college in h6 size with blue as fontcolor and background color yellow separated by a thick line and below which a paragraph about the facilities offered by your college is described.

Exercise 3: Create a web page to demonstrate a pull-down menu. The menu should contain the list of your favorite south Indian dishes.

Web links: https://onlinecourses.swayam2.ac.in/nou21_cm14/preview

(12Hrs)

Unit – 5: Cascading Style Sheet (CSS): CSS Overview, CSS Rules, Example with Type Selectors and the Universal Selector, CSS Syntax and Style, Class Selectors, ID Selectors, spanand div Elements, Cascading, style Attribute, style Container, External CSS Files, CSS Properties, Color Properties, RGB Values for Color, Opacity Values for Color, HSL and HSLA Values for Color, Font Properties, line-height Property, Text Properties, Border Properties, Element Box, padding Property, margin Property.

Description: Cascading Style Sheets (CSS) is a stylesheet language used to describe the presentation of a document written in HTML or XML. CSS allows you to control the layout, colors, fonts, and overall visual appearance of web pages.

Learning Outcome: CSS effectively equips you with the skills to style and layout web pages with precision and creativity.

Example: CSS would be applied to enhance the visual appeal of product pages, making them more attractive and functional for users.

Exercise 1: Create a web page with name of your college as text. The text should scroll, alternate and slide.

Exercise 2: Create a web page to display an image surrounded by text on all the four sides.

Exercise 3: Create a web page to display 3 images which are aligned left, right and center respectively.

Web links: https://onlinecourses.swayam2.ac.in/nou21_cm14/preview

Text Books:

1. Introduction to E-Commerce: Combining Business and Information Technology By MartinKutz.
2. Lallana, Quimbo, Andam, 4. Cf. Ravi Kalakota and Andrew B. Whinston, ElectronicCommerce: A Manager's Guide (USA: Addison Wesley Longman, Inc., 1997), 19-20.

References:

1. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & BartlettLearning
2. HTML & CSS: The Complete Reference, 5th Edition, Thomas. A. Powell.

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SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
(An autonomous college in the jurisdiction of Krishna University, Machilipatnam)
SEMESTER -END MODEL QUESTION PAPER

Course Code & Title of the Course:	**23CAMAL231**
Title:	**E Commerce and Web Designing**
Offered to:	**B.Com Honours Computer Applications Sec A & B**
Category: Major	**SEMESTER: 3**
Max. Marks	**70**
Max.Time	**3 Hrs**

Section A:

Short Answer QuestionsAnswer All questions. Each question carries 4 Marks. Marks: 20

Q1 (a) Describe E-Commerce with 5-C Model. K1OR

(b) Describe the concept of Web 2.0. K1

Q2 (a) Interpret B2c Software Systems. K2
OR

(b) Distinguish Between B2b And B2c. K2

Q3 (a) Illustrated the concept of Compliance K3
Management.OR

(b) Demonstrate Information Security Management (Ism). K3

Q4 (a) Illustrated the concept of HTML Elements
K3

(b) OR
Elaborate old HTML and HTML5 K2

Q5 (a) Describe the CSS Rules. K1
OR

(b) Describe the concept of Class Selectors K1

Section B:

Long Answer QuestionsAnswer All questions. Each question carries 10 Marks. Marks: 50

Q6 (a) Explain about Business Models Related to E- Commerce. K1OR

(b) What is the Fundamental Sales Process and His 7+1 Process Steps Work? K1

Q7 (a) Explain the concept of Supply Chain Management K1OR

(b) What is the Customer Relationship Management (CRM). K2 Q8 (a) Illustrate the concept of Foundations of Risk Management K3
OR

(b) Describe the Payment Procedures and Cyber Money. K1

Q9 (a) Describe the HTML tags, HTML Elements, HTML attributes. K1OR

(b) Describe the Web Page with Character References, and Phrasing Elements. K1Q10 (a) Explain the concept of CSS Syntax and Style. K1
OR

(b) Describe the Border Properties, Element Box, padding Property, margin Property. K4

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Course Code				**23CAMAP231**			
Title of the Course				**E COMMERCE AND WEB DESIGNING LAB**			
Offered to: (Programme/s)				**B.Com Honours Computer Applications Sec A & B**			
L	**0**	**T**	**0**	**P**	**2**	**C**	**1**
Year of Introduction:	**2024-25**			**Semester:**			**3**
Course Category:	**MINOR**			**Course Relates to:**		**GLOBAL**	
Year of Revision:	**2024**			**Percentage:**		**NA**	
Type of the Course:				**Major**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				**Programming knowledge**			

Course Description:

The objective of course is to provide students with practical experience using the questions should be practiced using **Blue Griffon, Google Web Designer, KompoZer and open Element /any related tools.** The students should be taught the usage of appropriate html tags for these questions

Course Aims and Objectives:

S. NO	COURSE OBJECTIVES
1	Students will learn to implement display a hyperlink which when clicked directs you toAmazon website.
2	Students will explore and implement B2c Basics, B2c-Business and CRM, B2c Software Systems
3	Students will analyze Foundations of Risk Management, Compliance Management.
4	Students will apply the concept of html tags, html elements, html attributes, css preview
5	Students will improve their proficiency in programming languages HTML coding conventions, Comments, HTML Elements, Should Describe Web Page

Course Outcomes

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

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Implement web page to demonstrate taking various applications of ecommerce.	K2	6,7	1,2
CO2	Analyze the performance of Credit card/Debit card/Online transfer.	K3	6,7	1,2
CO3	Apply web page to display definition list which defines the terms: B2B,B2C, C2B, C2C.	K3	6,7	1,2
CO4	Develop efficient and optimize HTML code for various E-Commerceoperations.	K3	6,7	1,2
CO5	Demonstrate proficiency in a programming language used for Web Page.	K3	6,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						2	3	2	2
CO2						3	2	2	3
CO3					3	2	3	3	2
CO4						3	3	2	3
CO5						3	3	3	3

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of a Web Designing lab course, providing hands-on practice with various Web Designing, enabling students to implement and manipulate these Web Designing to solve real-world problems efficiently. Through a series of HTML programming exercises and projects, students will develop practical skills in designing, analyzing, and optimizing Web Designing.

Unit 1: Basic Concepts: (6Hrs)

Lab 1:

Create a web page to display a hyperlink which when clicked directs you to Amazon website.

Exercise 1:

Display a hyperlink**:**

Objective: Learn to display a hyperlink which when clicked directs you to Amazon website.

Tasks:

Write a program to display a hyperlink which when clicked directs you to Amazon website.

Lab 2:

2. Create a web page to demonstrate your college name aligned with the logo of your college.

Exercise 1:

Display a college logos**:**

Objective: Learn to develop HTML code for creating websites

Tasks:

Write a program to create a college name aligned with the logo of your college

Unit 2: Digital Marketing

Lab 3:

Digital Marketing

Representation of Scrolls randomly

Objective: To understand the concept and web page to display the text "DigitalMarketing"

2. Tasks:

Write Program Create a web page to display the text "Digital Marketing" which scrollsrandomly.

Lab 4:

E-Commerce" for exactly 5 times from left to right of the screen.

Representation of moving of text left to right

Objective: To understand the concept and types of Web pages.

2. Tasks:

Write Program to implement Create a web page to scroll the text "E-Commerce" for exactly 5times from left to right of the screen.

Lab 5:

Redirection of pages

Representation of redirects you to your college website.

Objective: To understand the concept how to redirect the web page better

4. Tasks:

5. Write Program to implement a web page to insert an image which when clickedredirects you to your college website.

6. Create a web page to display the name of your college in h6 size with blue as fontcolour

Unit 3: Headings

Lab 6

Headings

Implementing the headings in the web page.

2. **Objective:** Understanding to implement the headings in the webpage.

Create a web page to display the name of your college in h6 size with blue as font colour

Lab 7:

Create a web page to demonstrate a pull-down menu. The menu should contain the list of yourfavorite south Indian dishes.

Create a web page with name of your college as text. The text should scroll, alternate andslide.

Create a web page to display an image surrounded by text on all the four sides.

Unit 4:

Images Which Are Alignment

Lab 8:

2. **Objective:** Implementation of Alignments
3. **Tasks:**

a) Create a web page to display 3 images which are aligned left, right and centerrespectively.

b) Create a login page asking the user to enter his username and password followed by a submitbutton

Unit 5: Form titled as Feedback form (6Hrs)

Lab 8:

Creation of forms with feedback form

1. Feedback Form:

Objective: Understanding **Creation of Feeback forms**

a) Create a web page using a form titled as Feedback form which takes the feedback offaculty teaching a particular subject in your college.

b) Create an unordered list of popular B2C ecommerce web sites.

References:

1. "Introduction to E-Commerce: Combining Business and Information Technology ByMartin Kutz.

2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & BartlettLearning

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

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23CAMAP231 : Ecommerce And Web Designing Lab

Offered to B.Com Honours Computer Applications Sec A & B **Semester: III**
Max. Marks : 50 (CIA: 15 + SEE: 35) **Hrs/Week: 2**

Model Paper : Practicals

Time: 3 Hrs. **Max. Marks: 35**

Section – A

1. Experiment-1 15 M

2. Experiment-2 10 M

Section – B

Viva Voce 10 M

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Course Code				**23CSMIL231**			
Title of the Course				**Object Oriented Programming Using Java**			
Offered to: (Programme/s)				**B.Sc Honours (Chemistry)**			
L	**4**	**T**	**0**	**P**	**0**	**C**	**4**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:		**MINOR**		**Course Relates to:**		**GLOBAL**	
Year of Introduction:		**2024**		**Percentage:**		**NA**	
Type of the Course:				**MINOR**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				Knowledge in C Programming			

Course Description:

This course provides the fundamental components and libraries of the Java programming language, with a strong emphasis on object-oriented programming (OOP) principles. It constitutes as the foundation for Java development, providing the essential building blocks and features for creating robust and scalable applications.

Course Aims & Objectives:

S. No	COURSE OBJECTIVES
1	Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2	Realize fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3	Analyze step by step and develop programs on inheritance and interfaces,arrays and string handling functions
4	Understand the Fundamental features of multi-threaded programs, Exception handling
5	Understand packages, I/O streams in java

Course Outcomes:

At the end of the course, the student will / will be…

NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Develop a comprehensive understanding how object-oriented concepts are incorporated into the Java programming language	K2	**1,2,6**	**1,2**
CO2	Implementing Object Oriented Programming Concepts(class, constructor, overloading) in java	K3	**2,6**	**1,2**
CO3	Implementing arrays, inheritance and interfaces in a Java program.	K3	**2,6**	**1,2**
CO4	Implementing Multithreading, exception handling in Java.	K3	**2,6**	**1,2**
CO5	Implementing Packages and Files in java.	K3	**2,6**	**1,2**

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO-PSO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	3				2		2	1
CO2		3				2		2	1
CO3		3				2		2	1
CO4		3				2		2	1
CO5		3				2		2	1

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSOrespectively

Course Structure:

Unit – I: Introduction to Java Programming (12 Hrs.)

Introduction-Object Oriented paradigm-Basic Concepts of OOP-Benefits of OOP- Applications of OOP- Java features-Simple Java program structure-Java tokens-Java Statements-Implementing a Java Program-Java Virtual Machine-Command line arguments- Constants-Variables-Data Types-Declaration of Variables-Giving Value to Variables-Scopeof variables-Symbolic Constants-Type casting-Getting Value of Variables - types of operators with examples-expressions

Description:

This course is tailored to understand fundamentals of programming such as variables,conditional and iterative execution, methods, etc.

Examples:

1. Operators concept in java
2. Type casting in java

Exercises:

1. Design Java program to perform Type Casting in java.
2. Develop a Java program for sorting a given list of names in ascending order.

Learning Outcomes:

By the end of the unit, students will understand the concept and underlying principles of Object-Oriented Programming and object-oriented concepts are incorporated into the Java programming language

Web Resources:

Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of Java Programming", 2018.
https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

Unit – II: Control statements, Classes, Objects and Methods (12 Hrs.)

Introduction-Decision making with if statement-Simple if statement-If Else statement- Nesting of if else statements-The else if ladder-The switch statement-The conditional operator-The While statement-The do-while statement-The for statement- Jumps in loops- Defining a class-Adding variables-Adding methods-Creating objects-Accessing class members-Constructors-Method overloading.

Description:

This unit provides fundamentals of object-oriented programming in Java, including definingclasses, invoking methods, using class libraries, etc.

Examples:

1. Control statements in java
2. Constructors, Method overloading, Static keyword in java

Exercises:

1. 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.
2. Construct a Java program that implements method overloading

Learning Outcomes:

By the end of this unit, students will be able to gain knowledge in Implementing ObjectOriented Programming Concepts like class, constructor, overloading concepts in java

Web Resources:

Introduction to Classes and Objects in Java , Neso Academy, 7 june 2020
https://www.youtube.com/watch?v=W-D71ZeMixQ&list=PLBlnK6fEyqRiwWLbSXKFtdGV8OVqr9dZr

Unit – III: Arrays, Inheritance and Interfaces (12 Hrs.)

Arrays- One dimensional arrays- Creating an array – Two dimensional arrays -Extending aclass - Overriding methods-Final variables and methods-Final classes-Abstract methods andclasses MULTIPLE INHERITANCE: Introduction- Defining interfaces- Extending interfaces- Implementing interfaces-Accessing interface variables

Description:

This unit helps in understanding the principles of inheritance and interfaces, array creationin java

Examples:

7. Types of inheritances.
8. array creation in java

Exercises:

1. Design a Java program to calculate multiplication of 2 matrices.
2. Construct a program for extending and implementing interfaces.

Learning Outcomes:

By the end of this unit, students will be able to understand and implement inheritance andinterfaces, array creation and string handling functions in a Java program.

Web Resources:

1.Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Inheritance in Java",2018.
https://www.youtube.com/watch?v=rxsl1TzcEgg
2. Arrays in Java by Neso Academy,2019
https://www.youtube.com/watch?v=kWJHzambtNo&list=PLBlnK6fEyqRiraym3T703apTvE ZLaSVtJ
3.What is string in Java **by Lab Mug** ,2023
https://www.youtube.com/watch?v=Vv8ijzbz22s

Unit – IV: Multi-Threading, Exception Handling (12 Hrs.)

Introduction-Creating Threads-Extending the Threads-Stopping and Blocking a Thread- Lifecycle of a Thread-Using Thread Methods-Implementing the 'Runnable' Interface-Types of errors-Compile time errors-Run-time errors-Exceptions-Exception handling-Multiple Catch Statements-Using finally statement

Description:

This unit helps in understanding and implementing multi-threaded programs, Exception handling

Examples:

7. Multi-threading in java
8. Types of exception handling mechanisms

Exercises:

1. Develop 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 byusing extending Thread class.

2. Construct Java program to implement various types of Exception HandlingMechanisms

Learning Outcomes:

By the end of this unit, students will be able to Implement Multithreading, exception handling

Resources:

1.Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Exception Handling inJava", 2018. https://www.youtube.com/watch?v=vUov8EkjZjU&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=23

2. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Multi Threading inJava", 2018. https://www.youtube.com/watch?v=6rYOyIGfy3w&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=27

Unit – V: Packages and I/O Files (12 Hrs.)

Java API Packages-Creating Packages-Accessing a Package- Using a Package-Concept of Streams-Stream classes-Byte Stream Classes-Character Stream classes: Reader stream classes, Writer Stream classes-Reading and writing files.

Description:

This unit focuses Understanding packages, I/O streams in java

Examples:

Package creation

Writing and Reading Files.

Exercises:

1. Write a program to create and Import Packages

2. Create a program for writing and reading Files

Learning Outcomes:

By the end of this unit, students will be able to implement packages in Java programs, Input/output Streams in java

Resources:

1.Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Packages in Java", 2018.

https://www.youtube.com/watch?v=TwU3cv1FFis&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=17

2. "File Handling in Java", Learn Coding, 2021. https://www.youtube.com/watch?v=VJgCjLuU4e8&list=PLqleLpAMfxGDVu5tUmUg9jSQ UUB8_5DB0

Specific Resources:

Text Books:

1. E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-HillCompany.

Reference Books:

1. Programming in Java by Sachin Malhotra, OXFORD University Press
2. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series,TATA McGraw-Hill Company.
3. Deitel &Deitel. Java TM: How to Program, PHI (2007)

4. Java Programming: From Problem Analysis to Program Design- D.S Mallik
5. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press(2008)

Web Resources:

Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of JavaProgramming", 2018.
https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
(An autonomous college in the jurisdiction of Krishna University, Machilipatnam)

SEMESTER -END QUESTION - PAPER

Course Code & Title of the Course:	**23CSMIL231 Object Oriented Programming Using Java**
Offered to:	**B.Sc Honours (Chemistry)**
Category:	**SEMESTER: 3**
Max. Marks	**70**
Max.Time	**3 Hrs**

Section A: Short Answer Questions (20 Marks)

Answer All questions. Each question carries 4 Marks.

1. A) Discuss about structure of java program.(K2)
   OR
   B)Discuss about data types in java.(K2)
2. A) Explain accessing class members with an example. (k2)
   OR
   B)Explain constructors in java with example. (K2)
3. A) Discuss about 2-D Array in java with example.(k2)
   OR
   B)Illustrate implementing interfaces in java with example. (K3)
4. A) Describe Thread Creation in java with an example.(k2)
   OR
   B)Explain finally block with an example. (K2)
5. A) Explain byte stream classes in java. (k2)OR
   B) Explain File creation in java with example. (K2)

Section B: Long Answer Questions (50 Marks)

Answer All questions. Each question carries 10 Marks.

6. (A) Discuss Object Oriented Programming Principles. (k2)
   (OR)
   (B) Discuss Java Buzz words. (K2)
7. (A) Describe Method Overloading with an example program. (k2)
   (OR)
   (B)Describe the concept of static members in java with example. (K2)
8. (A) Explain the concept of final keyword with example. (k2)
   (OR)
   (B)List of different types of inheritance in java and explain with examples. (K2)
9. (A) Explain life cycle of a thread with neat diagram. (k2)
   (OR)
   (B)Define Exception. Explain Exception handling mechanism in java withexamples (K2)
10. (A) Describe package creation and accessing with example. (k2)
    (OR)
    (B) Explain writing and reading files in java. (K2)

Note:

- Short answer questions assess foundational knowledge (Remembering, Understandingand Apply).
- This structure emphasizes a focus on higher-order thinking skills (Understand,Application, Analysis, and Evaluation) in the long answer section.
- Consider including a mix of question types within each section to ensure acomprehensive assessment.

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
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Course Code				**23CSMIP231**			
Title of the Course				**Object Oriented Programming Using Java Lab**			
Offered to: (Programme/s)				**B.Sc Honours (Chemistry)**			
L	**0**	**T**	**0**	**P**	**2**	**C**	**1**
Year of Introduction:	**2024-25**			**Semester:**			**3**
Course Category:	**MINOR**			**Course Relates to:**	**GLOBAL**		
Year of Revision:	**2024**			**Percentage:**			
Type of the Course: THEORY				**Employability**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				**Programming knowledge**			

Course Description:

The objective of course is to provide students with practical experience in Object Oriented Programming in Java.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Teach students to know the fundamental concepts in java
2	Provide comprehensive training in designing classes, objects and methods in java
3	Teach students to know inheritance, interfaces concepts in java
4	Train students to gain knowledge in multi threading , exception handling and packages
5	Teach students to know Applets Creation and File Creation

Course Outcomes

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

CONO	COURSE OUTCOME	BTL	PO	PS O
CO1	Creating java programs that covers fundamental concepts	**K6**	**2,6**	**1,2**
CO2	Creating class, constructor, method overloading, method overriding in java.	**K6**	**2,6**	**1,2**
CO3	Creating arrays, types of inheritance and interfacesin a Java program	**K6**	**2,6**	**1,2**
CO4	Creating Multithreading, different types of exception handling mechanisms, Creating and accessing packages in Java.	**K6**	**2,6**	**1,2**
CO5	Creating Applets, Files in Java program.	**K6**	**2,6**	**1,2**

CO-PO MATRIX									
CO NO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1		**3**				**2**		**2**	**1**
CO2		**3**				**2**		**2**	**1**
CO3		**3**				**2**		**2**	**1**

CO4		3				2		2	1
CO5		3				2		2	1

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of Object Oriented Programming in Java Lab course,providing hands-on practice

Unit-1 : Introduction to Java Programming

Lab 1

Design Java program to perform Type Casting in java.

Develop a Java program for sorting a given list of names in ascending order.

Unit-2 : Control statements, Classes, Objects and Methods

Lab 2

Create a class Rectangle. The class has attributes length and width. It should havemethods that calculate the perimeter and area of the rectangle. It should have readAttributes method to read length and width from user.

Construct a Java program that implements method overloading.

Unit-3 : Inheritance, Arrays, Strings and Interfaces

Lab 3

Design a Java program to calculate multiplication of 2 matrices. Construct a Java program to implement various types of inheritance

i. Single ii. Multi-Level iii. Hierarchical iv. Hybrid

Lab 4

Write a java program to implement Abstract Classes.Develop a program to demonstrate Final Keyword

Lab 5

Design a program for implementing interfaces.Develop a program on Multiple Inheritance.

Unit-4 : Multi-Threading, Exception Handling and Packages

Lab 6

Write a Java program that creates three threads. First thread displays “OOPS”, thesecond thread displays “Through” and the third thread Displays “JAVA” by usingRunnable interface.

Write a program to create and Import Packages

Lab 7

Construct Java programs to implement various types of Exception HandlingMechanisms

iv. Arithmetic Exception

v. Number Format Exception

vi. Array Index Out of Bounds Exception

Design a program to demonstrate Finally Block

Unit-5: Applets, Streams, Files and JdbcLab -8

Write a program to create an Applet

Create a program for writing and reading Files.

References:

1.E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-HillCompany.

Web Resources:

Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur.“Basic Concepts of Java Programming”, 2018.

https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

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(An autonomous college in the jurisdiction of Krishna University, Machilipatnam)
23CSMIP231 : **Object Oriented Programming Using Java Lab**

Offered to: B.Sc Honours (Chemistry) **Semester: III**
Max. Marks : 50 (CIA: 15 + SEE: 35) **Hrs/Week: 2**

Model Paper : Practicals

Time: 3 Hrs. **Max. Marks: 35**

Section – A

1. Experiment-1 15 M

2. Experiment-2 10 M

Section – B

Viva Voce 10 M

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Course Code				**23CAMIL231**			
Title of the Course				**DATABASE MANAGEMENT SYSTEMS**			
Offered to: (Programme/s)				**BA Honours Economics**			
L	**4**	**T**	**0**	**P**	**2**	**C**	**3**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:		**MINOR**		**Course Relates to:**		**GLOBAL**	
Year of Introduction:		**2024**		**Percentage:**		**NA**	
Type of the Course:				**MINOR**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				Basic understanding of Computer Science Principles			

Course Description:

This course provides an in-depth introduction to DBMS. Students will explore thefundamental concepts and techniques for designing, implementing, and managing databases.

Course Aims & Objectives:

S. No	COURSE OBJECTIVES
1	An ability to apply Knowledge of computing and mathematics in Computer Science.
2	An ability to analyse a problem, identify and define the computing requirements appropriate to its solution.
3	An ability to design, implement and evaluate a computer-based system to meet desired needs with appropriate societal considerations.
4	An ability to conduct investigations, interpret data and provide conclusions in investigating complex problems related to Computer Science.
5	An ability to engage in continuing professional development and life-long learning.

Course Outcomes:

At the end of the course, the student will / will be…

NO	COURSE OUTCOME	BTL	PO	PSO
CO1	An ability to apply Knowledge of computing and mathematics in Computer Science.	K3	6,7	1,2
CO2	An ability to analyse a problem, identify and define the computing requirements appropriate to its solution.	K4	6,7	1,2
CO3	An ability to create, implement and evaluate a computer-basedsystem to meet desired needs with appropriate societal considerations.	K6	6,7	1,2
CO4	An ability to evaluate investigations, interpret data and provide conclusions in investigating complex problems related to ComputerScience.	K5	6,7	1,2
CO5	An ability to understand continuing professional development and life-long learning.	K2	6,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO-PSO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						1	2	1	1
CO2						2	1	1	2
CO3					2	1	2	2	1
CO4						2	2	1	2
CO5						2	2	2	2

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure:

Unit – I (Overview of Database systems & Data Models) (7 Hrs.)

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

Data Models: Introduction; types of data models, Concepts of Schema, Instance and data independence, Three tier schema architecture for data independence; Database system structure.

Description :

Databases describe the differences between Database systems and File based systems. It also studies database models and their advantages and dis-advantages. Database system architecture is designed at different levels.

Learning Outcomes:

Explain the basic concepts of database and file system with its applications, types of data models, database system structure and architecture.

Exercises/Projects:

Draw the architecture for the database structure.

Special Resources: (web)

Introduction to Database Systems by Prof. Srineevasa Kumar, IIT Madras

https://archive.nptel.ac.in/courses/106/106/106106220/

Unit – II (Relational Model) (10 Hrs.)

Relational Model: Introduction to relational model, Codd's rules, concepts of domain,attribute, tuple, relation, constraints (Domain, Key constraints, integrity constraints) and theirimportance.

Normalization: Purpose of Normalization or schema refinement, normal forms based on functional dependency(1NF, 2NF and 3 NF), Boyce-codd normal form(BCNF).

Description:

Describe Relational model and normalization for database design for reducing redundancy indata with the help of several normalization techniques.

Learning Outcomes:

Explain the relational model and normalization techniques for database design in database system.

Exercises/Projects:

Draw the relational database model with a real time example.

Special Resources: (web)

Normalization Techniques by Dr. Ganapathy Krishnamurthy , IIT Madras

https://www.youtube.com/watch?v=9rjJDHAkitY

Unit – III (Entity Relationship Model) (10 Hrs.)

Entity Relationship Model: Introduction, Representation of entities, attributes, entity set,

relationship, relationship set, constraints, sub classes, super class, inheritance, specialisation, generalisation using ER Diagrams.

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

Description:

Entity Relationship is examined in data storage and query processing using SQL. It helps increate, maintain and manipulate a relational database using SQL.

Learning Outcomes:

Explain the Relationship model with its constraints using real time examples.

Exercises/Projects:

Draw the structure of specialisation and generalisation.

Special Resources: (web)

Entity Relationship Model, Prof. N. L. Sarada, IIT Bombay

https://www.youtube.com/watch?v=WSNqcYqByFk

Unit – IV (Functions in SQL) (8 Hrs.)

SQL: Nested queries/ subqueries, implementation of different types of joins, SQL functions(Date, Numeric, String, Conversion functions), Creating tables with relationship, implementation ofkey and integrity constraints, views.

Description:

SQL queries try to work on different types of data to convert some sample data toinformation and implementation of key and integrity constraints.

Learning Outcomes:

Explain the implementation of key and integrity constraints and functions in SQL.

Exercises/Projects:

Draw the structure of the join and its types with suitable examples.

Special Resources: (web)

Joins and its types, N. Praveen Kumar, IIT Kanpur

https://www.youtube.com/watch?v=a-MELgvfGdQ

Unit – V (Structures in Pl/SQL) (10 Hrs.)

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

Description:

Programming Language using SQL and concepts on cursors, control structures, procedures,functions, packages and exception handling.

Learning Outcomes:

Explain the concepts on cursors, control structures, procedures, functions and packages.

Exercises/Projects:

Draw the structure of exception handling.

Special Resources: (web)

PL/SQL Programming by Prof. Srineevasa Kumar, IIT Madras

https://www.youtube.com/watch?v=jb-7jDate8w

Specific Resources:

Text Books:

1. **Database Management Systems, 3rd Edition , Raghurama Krishnan, JohannesGehrke, TMH**
2. **Database System Concepts,5th Edition , Silberschatz, Korth, TMH**

Web Resources: **C:/Users/cscdept/Downloads/Ramakrishnan%20-%20Database%20Management%20Systems%203rd%20Edition.pdf**

Prof. Partha Pratim Das,Department of Computer science and Engineering,IIT Kharagpur.
https://www.youtube.com/watch?v=OMHbGm9SQuE&list=PLZ2ps_7DhBYc4jkUk_yQAjYEVFzVzhdU&index=1

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
(An autonomous college in the jurisdiction of Krishna University, Machilipatnam)

SEMESTER -END QUESTION PAPER STRUCTURE

Course Code & Title of the Course:	**Database Management Systems 23CAMIL231**
Offered to:	**BA Honours Economics**
Category: Major	**SEMESTER: 3**
Max. Marks	**70**
Max.Time	**3 Hrs**

Section A: Short Answer Questions (20 Marks)Answer All questions. Each question carries 4 Marks.

1 A)What are the differences between data and information.(K1)

(OR)

B) Write a short note on evolution of data models. (k2)

2 A).Write about CODD'S rules? (k2)

(OR)

B). Explain about functional dependency in dbms? (k1)

3 A) Explain about ER model (k1)

(OR)

B) Write about DML operations. (k2)

4 A) Explain different types of Aggregate functions in SQL. (k1)

(OR)

B) Write a short note on views in SQL. (k2)

5 A) Explain Structure of PL/SQL (k1)

(OR)

B) Explain Functions in PL/SQL (k1)

Section B: Long Answer Questions (50 Marks) Answer All questions. Each question carries 10 Marks.

6 A) Explain the characteristics and advantages of DBMS? (k2)

(OR)

B) Explain briefly about the architecture of DBMS. (k2)

7 A) Explain key and integrity constraints with an example? (k2)

(OR)

B). What is normalization? Explain with an example upto 3NF? (k2)

8 A) Write a short note on specialisation and generalisation. (k2)

(OR)

B) What is DMl and DDL ? Explain its operations with suitable examples. (k1)

9 A) Explain joins and its types with example (k2)

(OR)

B). Explain views in SQL with syntax and examples. (k2)

10 A) Discuss about iterative control statements available in PL/SQL with syntaxand examples.(k3)

(OR)

B). Explain exception handling in PL/SQL (k3)

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Course Code				**23CAMIP231**			
Title of the Course				**DATABASE MANAGEMENT SYSTEMS LAB**			
Offered to: (Programme/s)				**BA Honours Economics**			
L	**0**	**T**	**0**	**P**	**2**	**C**	**1**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:		**Minor**		**Course Relates to:**		**Global**	
Year of Revision:		**2024**		**Percentage:**			
Type of the Course: LAB				**Employability**			
Cross cutting Issues of the Course :							
Pre-requisites, if any				**Programming Knowledge**			

Course Description:

The objective of course is to provide students with practical experience in Database Management System using SQL and PL/SQL. Students will learn to create and manage database objects, perform data manipulation and retrieval, implementing queries and applyingPL/SQL programs.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Introduce fundamental concepts and syntax of SQL.
2	Proficiency in writing and executing SQL queries to interact with a database.
3	Competence in manipulating and managing data within a database.
4	Ability to optimize database performance through query optimization techniques.
5	Understanding and managing data with the help of Programming Languages.

Course Outcomes

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

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Implementing DDL commands in SQL by creating, inserting and selecting tables.	K2	6,7	1,2
CO2	Performing data manipulation operations using DML commands.	K3	6,7	1,2
CO3	Understand and implement various types of joins.	K3	6,7	1,2
CO4	Execute basic commands in PL/SQL.	K3	6,7	1,2
CO5	Implement procedures in PL/SQL.	K3	6,7	1,2

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						1	2	1	1
CO2						2	1	1	2
CO3					2	1	2	2	1
CO4						2	2	1	2
CO5						2	2	2	2

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSOrespectively

Course Structure

This lab list covers the key areas of Database Management System Lab course, providinghands-on practice with basics on PL/SQL.

List of Experiments

SQL :

Unit-I: Implementing DDL commands in SQL (4 Hours)Lab 1:

Exercise 1: Creating Tables

1. Create a table to understand basic table creation.

Tasks:

- Create a table Employee with columns: Employee_ID, First_Name,Last_Name, Hire_Date, and Department_Name.
- Create a table Project with columns: Project_ID, Project_Name, andStart_Date.

Execute following commands:

1. Display all the information of the EMP table?
2. List the emps in the asc order of their Salaries?
3. List the details of the emps in asc order of the Dptnos and desc of Jobs?
4. Display all the unique job groups in the descending order?
5. List the emps who joined before 1984.

2. Create a table to understand basic table creation.

Tasks: Create a table Course with columns: Course_ID, Course_Name,College_Name, CourseStart_Date, and CourseEnd_Date.

- Create a table College with columns: College_ID, College_Name, andCollege_Address.

Execute following queries:

1. Retrieve the list of coursenames, college and the address of all the courses.
2. List all the colleges which are located in 'Mumbai' or 'Bangalore'.
3. List the various courses available from the college table.
4. Find the names of colleges who have courses in B.A.
5. List the names of all colleges having 'a' as the second letter in their names.
6. List all courses whose College Name is in Vijayawada..
7. List the colleges who stay in the address whose first letter is 'M'.

Unit-III Implementing Primary Key and Foreign Key Constraints

(6 Hours)Lab 3:

Exercise 3:

Defining Tables with Primary and Foreign Keys

1. **Objective:** Learn to create tables with primary key and foreign key constraints toensure referential integrity.
2. **Tasks:**

1. Table Name: Client-Master Description: Used to store client information

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

2. Table Name: Product_Master Description: Used to store product information

ColumnName	Data Type	Size	Attribute
PRODUCT_NO	Varchar2	6	Primarykey
DESCRIPTION	Varchar2	15	Not null
PROFIT _PERCENT	Number	4,2	Not null
UNIT_MEASUE	Varchar2	10	
QTY_ON_ HAND	Number	8	
REORDER_LVL	Number	8	
SELL_PRICE	Number	8,2	Not null, cannot be 0
COST _PRICE	Number	8,2	Not null,cannot be 0

Solve the following queries by using above tables.

1. Retrieve the list of names, city and the state of all the clients.
2. List all the clients who are located in 'Mumbai' or 'Bangalore'.
3. List the various products available from the product_master table.
4. Find the names of salesman who have a salary equal to Rs.3000.
5. List the names o fall clients having 'a' as the second letter in their names.
6. List all clients whose Baldue is greater than value 1000.
7. List the clients who stay in a city whose first letter is 'M'.

https://livesql.oracle.com/apex/livesql/file/content_O5AEB2HE08PYEPTGCFLZU9YCV.ht ml

Unit-IV Implementing Joins and Views

(6 Hours)Lab 4:

Exercise 4:Tasks: Task I :

1. List the total information of EMP table along with DNAME and Loc of all theemps Working Under 'ACCOUNTING' & 'RESEARCH' in the asc Deptno.
2. Display the Empno, Ename, Sal, Dname, Loc, Deptno, Job of all emps working at CJICAGO or working for ACCOUNTING dept with Ann Sal>28000, but the Sal should not be=3000 or 2800 who doesn't belongs tothe Mgr and whose no is having a digit '7' or '8' in 3rd position in the asc order of Deptno and desc order of job.

Task II:

3. Display the total information of the emps along with Grades in the asc order.
4. List the Empno, Ename, Sal, Dname, Grade, Exp, and Ann Sal of empsworking for Dept 10 or20.

1. Create a simple view to display specific columns from a table.

Task: Create a view named Employee_View that displays Employee_ID, First_Name, andLast_Name from the Employees table.

2. Create a view that joins multiple tables.
   Task: Create a view named Employee_Department_View that displays Employee_ID,First_Name, Last_Name, and Department_Name by joining the Employees and Departments tables.

Unit 5: PL/SQL blocks **(4 Hours)**

Lab 5: basic PL/SQL programsExercise 5:

1. Write a PL/SQL program to check the given string is palindrome or not.
2. Write a PL/SQL program to display top 10 rows in Emp table based ontheir job and salary.
3. Create a procedure to update the salaries of Employees by 20%, for thosewho are not getting commission

References:

1. Nilesh Shah. (2011). *Database Systems Using ORACLE* (2nd ed.). PHI
2. https://www.youtube.com/playlist?list=PLL_LQvNX4xKyiExzq9GKwORoH6nvaRn OQ

TEXT BOOKS

1. **Database Management Systems, 3rd Edition , Raghurama Krishnan, Johannes Gehrke, TMH.**
2. **Database System Concepts,5th Edition , Silberschatz, Korth, TMH.**

Web Resources:

Prof. Partha Pratim Das,Department of Computer science and Engineering,IIT Kharagpur.
https://www.youtube.com/watch?v=OMHbGm9SQuE&list=PLZ2ps_7DhBYc4jkUk_yQAjYEVFzVzhdU&index=1

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SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA:: VIJAYAWADA
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23BAMIP231 : DataBase Management Systems Lab

Offered to: BA Honours Economics **Semester: III**
Max. Marks : 50 (CIA: 15 + SEE: 35) **Hrs/Week: 2**

Model Paper : Practicals

Time: 3 Hrs. **Max. Marks: 35**

Section – A

1. Experiment-1 15 M

2. Experiment-2 10 M

Section – B

Viva Voce 10 M

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