# Tulsi Computer Science & Information Technology College, Beed.

**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - I** **Subject: - Computer Organization.**

Q.1 Solve Any One 10

1. Addressing modes.
2. Pipelining in CPU.

Q.2 Fill in the blanks (10 Questions) 10

1. The _____ is the hardware component that executes instructions in a computer.
2. A _____ is a high-speed storage location directly accessible by the CPU for storing and retrieving data.
3. In a computer, the _____ unit performs arithmetic and logical operations.
4. The process of transferring data from main memory to a peripheral device is known as _____.
5. _____ is a method by which multiple signals are combined for transmission over a single medium.
6. The _____ time of a storage device is the time it takes to locate the data and make it available for processing.
7. _____ is the process by which the CPU fetches, decodes, and executes an instruction.
8. The _____ contains the address of the next instruction to be executed.
9. A _____ is an interface that allows a computer to communicate with external devices.
10. The _____ is a hardware mechanism that manages and handles multiple interrupt signals, ensuring that the CPU processes them in an orderly manner.

Q.3 Write a short note on any two of the following terms 10

1. Interrupts 2. Storage Technologies 3.Memory Hierarchy

# Tulsi Computer Science & Information Technology College, Beed.

**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - I** **Subject: - Operating System.**

Q.1 Solve Any One 10

1. Explain the need of inter-process synchronization.
2. Explain Distributed File Systems.

Q.2 Fill in the blanks (10 Questions) 10

1. The core component of an operating system that manages system resources and communication between hardware and software is called the _____.
2. The process of moving data between the CPU and the memory is managed by the _____ scheduler.
3. In an operating system, _____ is the act of running two or more tasks simultaneously.
4. The _____ is the part of the operating system that manages the execution of processes.
5. A _____ is a software interrupt triggered by an event that requires immediate attention.
6. The main function of the _____ is to manage the file system and control access to files.
7. _____ is a technique used to allow multiple programs to reside in memory and be executed by the CPU.
8. The _____ table keeps track of all the processes running on the system.
9. _____ is the state where a process is waiting for some event, such as I/O completion or a resource becoming available.
10. In a multitasking operating system, _____ is the term used to describe the switching of the CPU from one process or thread to another.

Q.3 Write a short note on any two of the following terms 10

1. Interrupt Handlers

2. Clocks

3. Terminals

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**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - I** **Subject: - Information Technology Concepts.**

Q.1 Solve Any One 10

1. Types of Languages
2. Explain LAN, MAN, WAN

Q.2 Fill in the blanks (10 Questions) 10

1. A _____ is a global network connecting millions of private, public, academic, business, and government networks.
2. _____ is the process of encoding messages or information in such a way that only authorized parties can read it.
3. _____ is the practice of protecting systems, networks, and programs from digital attacks.
4. _____ is a protocol used for secure communication over a computer network.
5. A _____ is a set of rules or guidelines used to manage the exchange of data between devices.
6. _____ is a network protocol used to transfer files from one host to another over a TCP-based network, such as the Internet.
7. _____ is a protocol used to assign IP addresses to devices on a network, ensuring that each device has a unique address.
8. In data processing, a _____ is a sequence of steps taken to gather, manipulate, and process data into a usable form.
9. _____ is a set of rules that determine how data is transmitted and received over a network, ensuring proper communication between devices.
10. _____ is the simultaneous execution of multiple computations to increase computational speed and efficiency.

Q.3 Write a short note on any two of the following terms 10

1. Evolution of information processing
2. Programming Languages
3. UNIX Commands

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**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - I** **Subject: - Financial Accounting**

Q.1 Solve Any One 10

1. Explain the accounting treatment of accounts receivable and bad debts. How the allowance method is used to account for doubtful accounts, and why is it preferred over the direct write-off method?
2. Describe the different methods of inventory valuation, such as FIFO (First-In, First-Out), LIFO (Last-In, First-Out), and weighted average cost. How do these methods affect the financial statements?

Q.2 Fill in the blanks (10 Questions) 10

1. The _____ principle requires that revenue be recognized when it is earned, regardless of when the cash is received.
2. _____ is the financial statement that shows a company's financial position at a specific point in time, detailing its assets, liabilities, and equity.
3. The accounting equation is _____ = Liabilities + Equity.
4. _____ represents the total amount of earnings a company has accumulated over its entire history, minus any dividends distributed to shareholders.
5. The _____ basis of accounting recognizes revenues when earned and expenses when incurred, regardless of when cash transactions occur.
6. The _____ principle states that expenses should be recorded in the period in which they are incurred to produce revenues.
7. _____ are obligations that the company must pay in the future as a result of past transactions.
8. _____ are economic resources owned by a business that are expected to benefit future operations.
9. The _____ statement provides a summary of the cash inflows and outflows for a company during a specific period.
10. _____ is the systematic allocation of the cost of a tangible asset over its useful life.

Q.3 Write a short note on any two of the following terms 10

1. What is the purpose of a cash flow statement? Explain the differences between operating, investing, and financing activities, and how each section contributes to understanding a company's cash flow
2. Discuss the accounting treatment for leases under the current accounting standards. How do finance leases differ from operating leases in terms of recognition on the financial statements?
3. What are adjusting entries, and why are they necessary in financial accounting? Provide examples of common adjusting entries and their impact on the financial statements.

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**Academic Year 2022-23**

**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - I** **Subject: - Programming in C**

Q.1 Solve Any One 10

1. Explain Tokens in C.
2. Write a C program to print following pattern

```
*
**
***
****
```

Q.2 Fill in the blanks (10 Questions) 10

1. The keyword used to define a function in C is _____.
2. The standard input-output library in C is included with the directive _____.
3. To declare a variable that can store a single character, you use the _____ data type.
4. The operator used to access the value stored at a pointer address is _____.
5. The function used to allocate memory dynamically in C is _____.
6. A _____ loop will execute its body at least once, regardless of the condition.
7. The function _____ is used to read a formatted input from the standard input (keyboard).
8. To terminate a C program and return a value to the operating system, the _____ function is used.
9. The _____ preprocessor directive is used to define symbolic constants in C.
10. To concatenate two strings in C, the function _____ is used.

Q.3 Write a short note on any two of the following terms 10

1. Explain recursion with an example
2. Write a C program to calculate the factorial of a given number.
3. Explain arithmetic operators.

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**Academic Year 2022-23**

**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - II** **Subject: - C++**

Q.1 Solve Any One 10

1. Explain polymorphism
2. Explain String class library and its functions.

Q.2 Fill in the blanks (10 Questions) 10

1. In C++, a _____ is a user-defined data type that groups related data members and member functions into a single unit.
2. The _____ keyword is used to allocate memory for a variable of a given data type.
3. To define a member function outside the class declaration, you need to use the _____ scope resolution operator.
4. A _____ function is a special member function that is called automatically when an object is created.
5. In C++, _____ inheritance allows a class to inherit properties and behavior from multiple base classes.
6. The _____ function is used to output data to the standard output stream.
7. To access the address of a variable in C++, you use the _____ operator.
8. A _____ is a function that calls itself either directly or indirectly.
9. In C++, _____ is the process of creating a new class from an existing class.
10. The _____ operator is used to access members of a class using a pointer to that class.

Q.3 Write a short note on any two of the following terms 10

1. Explain OOPS Concept

2. Explain Exception handling with an example

3. What is constructor?

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**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - II** **Subject: - Management Concepts**

Q.1 Solve Any One 10

1. Explain marketing mix elements
2. Explain tools of financial analysis.

Q.2 Fill in the blanks (10 Questions) 10

1. _____ is the process of coordinating and overseeing the work activities of others so that their activities are completed efficiently and effectively.
2. The four primary functions of management are _____, organizing, leading, and controlling.
3. _____ refers to the ability of a manager to create and share a clear and compelling vision for the future of the organization.
4. _____ is the management function that involves determining what tasks are to be done, who is to do them, how the tasks are to be grouped, who reports to whom, and where decisions are to be made.
5. The _____ theory of motivation suggests that people are motivated by a hierarchy of needs, starting with physiological needs and moving up to self-actualization needs.
6. _____ is a set of activities designed to achieve an organization's goals effectively and efficiently by integrating human, financial, and physical resources.
7. In a _____ organizational structure, each employee reports to only one manager, ensuring a clear line of authority.
8. _____ refers to the process of monitoring, comparing, and correcting work performance.
9. _____ is a leadership style characterized by individual consideration and intellectual stimulation, often associated with significant organizational change.
10. _____ analysis is a technique used to assess the strengths, weaknesses, opportunities, and threats involved in a project or business venture.

Q.3 Write a short note on any two of the following terms 10

1. Explain project time calculation through PER/CPM
2. Explain strategies of growth and diversification
3. Explain estimation and management of working capital.

# Tulsi Computer Science & Information Technology College, Beed.

**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - II** **Subject: - Data Structure and Pascal**

Q.1 Solve Any One 10

1. Explain ADT.
2. Explain searching algorithms..

Q.2 Fill in the blanks (10 Questions) 10

1. A _____ is a data structure that consists of a collection of elements, each identified by at least one array index or key.
2. The process of rearranging the elements of a data structure to ensure that they are in increasing or decreasing order is known as _____.
3. _____ is a data structure that consists of a collection of nodes linked together in a sequential manner.
4. The main program block in Pascal starts with the keyword _____ and ends with the keyword _____.
5. _____ is a data structure that consists of a collection of nodes where each node has a value and a pointer to the next node in the sequence.
6. _____ is a data structure that consists of a collection of elements, where each element is accessed by its position in the sequence.
7. _____ is a data structure that allows elements to be inserted and removed according to the Last In, First Out (LIFO) principle.
8. In a binary tree, each node can have at most _____ children.
9. The primary purpose of the Pascal programming language was originally for _____ programming.
10. _____ is a data structure that allows elements to be inserted and removed according to the First In, First Out (FIFO) principle.

Q.3 Write a short note on any two of the following terms 10

1. Heap sort
2. Searching algorithms
3. Queue and queue operations

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**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - II** **Subject: - Statistical Methods**

Q.1 Solve Any One 10

1. Explain the concept of Bayesian inference in statistics. How does it differ from frequentist inference, and what are some applications where Bayesian methods are particularly useful?
2. What are non-parametric tests in statistics? Describe a situation where a non-parametric test would be preferred over a parametric test, and provide an example of a common non-parametric test

Q.2 Fill in the blanks (10 Questions) 10

1. A _____ is a subset of a population used to represent the entire group as a whole.
2. The _____ measures the average of a set of numbers and is calculated by adding all the numbers together and dividing by the count of numbers.
3. The _____ is the middle value in a data set when the numbers are arranged in ascending or descending order.
4. The _____ is the value that appears most frequently in a data set.
5. _____ is a measure of the dispersion or spread of a set of values, calculated as the average of the squared differences from the mean.
6. The _____ measures the strength and direction of the relationship between two variables.
7. A _____ distribution is a probability distribution that is symmetric about the mean, showing that data near the mean are more frequent in occurrence than data far from the mean.
8. The _____ test is a statistical method used to determine if there is a significant difference between the means of two groups.
9. _____ is the process of using sample data to make generalizations about a population.
10. The _____ is a graphical representation of the distribution of a data set, showing the frequency of data within certain intervals.

Q.3 Write a short note on any two of the following terms 10

1. Define confidence intervals and explain their importance in statistical analysis. How do you interpret a 95% confidence interval for a population mean?
2. What is multivariate analysis? Discuss the purpose and application of one multivariate analysis technique, such as principal component analysis (PCA) or cluster analysis.
3. Explain the components of a time series and the purpose of time series analysis. Describe one method used in time series forecasting and its applications.

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**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS SY** **Total Marks:-30 Marks**

**Sem - III** **Subject: - Software Engineering**

Q.1 Solve Any One 10

1. Explain Coupling and Cohesion
2. Programming Paradigms

Q.2 Fill in the blanks (10 Questions) 10

1. _____ is a systematic, disciplined, and quantifiable approach to the development, operation, and maintenance of software.
2. The _____ model of software development involves a linear and sequential approach, with each phase dependent on the deliverables of the previous phase.
3. _____ is the process of identifying, defining, and managing changes to the software.
4. A _____ is a document that specifies the requirements, functionalities, and constraints of a software system to be developed.
5. The _____ model of software development involves breaking the software development process into smaller, more manageable cycles.
6. _____ testing is a type of testing that is performed to ensure that the individual units or components of a software work as expected.
7. _____ is the process of finding errors or defects in software and correcting them.
8. _____ is a type of software development methodology that focuses on customer satisfaction through continuous delivery of valuable software.
9. _____ is a technique used in software development to visualize the design of a system using graphical notation.
10. _____ is the process of verifying that the software meets the specified requirements and works as intended.

Q.3 Write a short note on any two of the following terms 10

1. Explain COCOMO
2. Explain types of testing
3. Explain SRS

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**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS SY** **Total Marks:-30 Marks**

**Sem - III** **Subject: - Data Communication & Network**

Q.1 Solve Any One 10

1. Explain different types of Transmission Media
2. Data Communication System

Q.2 Fill in the blanks (10 Questions) 10

1. In data communication, _____ is the process of converting digital data into a format suitable for transmission over a communication channel.
2. A _____ is a set of rules governing the exchange of data between devices on a network.
3. _____ is a network topology where each device is connected to a central point, such as a hub or switch.
4. The _____ layer of the OSI model is responsible for establishing, maintaining, and terminating connections between network devices.
5. _____ is a method used to detect and correct errors that occur during the transmission of data over a network.
6. A _____ is a device that connects multiple network segments together and forwards data packets between them.
7. In networking, a _____ is a unique identifier assigned to each device on a network.
8. The _____ layer of the OSI model is responsible for routing data packets to their destination across multiple networks.
9. _____ is a protocol used for the secure transmission of data over a network, commonly used for accessing websites securely.
10. _____ is a network protocol used to assign IP addresses to devices dynamically on a network.
11.

Q.3 Write a short note on any two of the following terms 10

1. TDM & FDM

2. OSI Model

3. Network Topologies

# Tulsi Computer Science & Information Technology College, Beed.

**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS SY** **Total Marks:-30 Marks**

**Sem - III** **Subject: - Database Management System & Oracle**

Q.1 Solve Any One 10

1. Explain DDL, DML, DQL, TCL
2. Function Dependancies

Q.2 Fill in the blanks (10 Questions) 10

1. A _____ is a collection of related data organized in a structured format that allows efficient access, retrieval, and management of data.
2. A _____ is a software system used to manage and manipulate databases.
3. _____ is a widely used relational database management system (RDBMS) developed by Oracle Corporation.
4. A _____ is a unique identifier for each row in a database table.
5. _____ is a database language used for managing and manipulating relational database systems.
6. In Oracle, a _____ is a collection of database objects, such as tables, views, and indexes, owned by a specific user.
7. A _____ is a logical grouping of database objects, such as tables, views, and stored procedures, in Oracle.
8. _____ is a process used to ensure that the data in a database is accurate, consistent, and up-to-date.
9. A _____ is a predefined query that is stored in the database for repeated use.
10. Oracle _____ is a feature that allows users to roll back transactions to a specific point in time.

Q.3 Write a short note on any two of the following terms 10

1. Explain Concurrency Control & Recovery Techniques

2. Explain Relational Algebra

3. Explain Relational Model Constraints

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**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS SY** **Total Marks:-30 Marks**

**Sem - III** **Subject: - System Analysis**

Q.1 Solve Any One 10

1. Explain Data capture techniques
2. Explain Role of System Analyst and others in System Development

Q.2 Fill in the blanks (10 Questions) 10

1. System analysis is the process of _____ a system to identify its goals, functions, and requirements.
2. A _____ is a graphical representation of a system that shows the relationships among system components.
3. A _____ is a person or entity that interacts with a system to achieve a specific goal.
4. The _____ phase of system analysis involves identifying problems or opportunities and defining the scope of the system.
5. _____ involves studying the existing system to understand how it currently operates and identifying areas for improvement.
6. In system analysis, _____ are the conditions or capabilities that must be met or possessed by a system.
7. The _____ phase of system analysis involves developing a detailed description of the system's functionality and features.
8. A _____ is a document that outlines the requirements for a new system or the modification of an existing system.
9. _____ is a technique used in system analysis to represent the flow of data through a system.
10. A _____ is a document that outlines the procedures for testing a new system or system modification.

Q.3 Write a short note on any two of the following terms 10

1. Explain Charting Techniques
2. Explain phases of system analysis and design
3. Explain batch and online processing.

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**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS SY** **Total Marks:-30 Marks**

**Sem - IV** **Subject: - Artificial Intelligence & Application**

Q.1 Solve Any One 10

1. Explain DFS & BFS
2. Explain Genetic Algorithm

Q.2 Fill in the blanks (10 Questions) 10

1. Artificial intelligence (AI) is the simulation of _____ processes by machines, especially computer systems.
2. _____ is a branch of AI that focuses on developing systems that can learn from and make predictions or decisions based on data.
3. _____ is the process of teaching a machine learning model using large amounts of labeled data.
4. In AI, a _____ is a rule-based system that makes decisions by following a set of predefined logical rules.
5. _____ is the branch of AI that focuses on creating systems capable of understanding and generating natural language.
6. _____ is a subfield of AI that deals with the creation of systems that can perceive and interpret visual information from the surrounding environment.
7. _____ is a technique used in AI to enable machines to perform tasks that typically require human intelligence, such as visual perception, speech recognition, and decision-making.
8. _____ is a popular technique used in AI for categorizing data points into groups based on similarities.
9. _____ is a type of AI algorithm that enables computers to improve their performance on a task through experience.
10. _____ is a subfield of AI that focuses on creating systems capable of reasoning, planning, and problem-solving.

Q.3 Write a short note on any two of the following terms 10

1. Explain the concept of Artificial Intelligence (AI) and its significance in modern computing.
2. Briefly explain the role of Natural Language Processing (NLP) in AI.
3. Explain Forward Reasoning

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**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS SY** **Total Marks:-30 Marks**

**Sem - IV** **Subject: - Marketing Management**

Q.1 Solve Any One 10

1. Explain the stages of the product life cycle. How marketing strategies should be adjusted at each stage to maximize the product's success?
2. Define Integrated Marketing Communications (IMC). What are the key components of IMC, and how do they contribute to a cohesive marketing strategy?

Q.2 Fill in the blanks (10 Questions) 10

1. _____ is the process of creating, communicating, and delivering value to customers and managing customer relationships in ways that benefit the organization and its stakeholders.
2. The _____ is a set of controllable marketing tools that a company uses to produce the response it wants in the target market, often referred to as the 4 Ps: Product, Price, Place, and Promotion.
3. _____ segmentation involves dividing a market into distinct groups of buyers based on demographic, psychographic, behavioral, or geographic factors.
4. The _____ is a concept that outlines the stages a product goes through from introduction to growth, maturity, and decline.
5. _____ is the process of developing and maintaining a strategic fit between the organization's goals and capabilities and its changing marketing opportunities.
6. _____ is the practice of promoting and selling products or services, including market research and advertising.
7. A _____ is a unique set of benefits or values that a company promises to deliver to customers to satisfy their needs.
8. _____ is a strategy that focuses on creating and distributing valuable, relevant, and consistent content to attract and retain a clearly defined audience.
9. _____ refers to the methods and tactics used to increase the visibility and perception of a brand, ensuring it is easily recognizable and preferred by the target audience.
10. _____ Marketing is the process of building, maintaining, and enhancing long-term relationships with customers and other stakeholders, focusing on customer satisfaction and retention.

Q.3 Write a short note on any two of the following terms 10

1. Discuss various sales promotion techniques used by companies. How do these techniques help in boosting short-term sales and customer engagement?
2. What is Customer Relationship Management (CRM)? Describe its importance in marketing management and how it helps in building long-term relationships with customers.
3. Outline the steps involved in the market research process. How does effective market research inform marketing decisions and strategy development?

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**Adarsh Nagar, D.P.Road-431122**

**Academic Year 2022-23**

**Class:-MMS SY** **Total Marks:-30 Marks**
**Sem - IV** **Subject: - System Programming**

Q.1 Solve Any One 10

1. Explain Subroutine Libraries
2. Explain Debugging techniques

Q.2 Fill in the blanks (10 Questions) 10

1. System programming involves the creation of software that interacts closely with the _____ to manage hardware resources.
2. The _____ is a set of software programs that acts as an intermediary between the hardware and the higher-level software applications.
3. _____ is a programming language commonly used in system programming due to its low-level capabilities and direct access to hardware resources.
4. The _____ is responsible for managing the allocation and deallocation of memory in a computer system.
5. A _____ is a program that runs continuously in the background and can be activated in response to certain events.
6. The _____ is responsible for managing input and output operations between the computer and its peripherals.
7. In system programming, a _____ is a small software program that allows the operating system to communicate with hardware devices.
8. The _____ is a program that manages the execution of other programs and allocates system resources.
9. _____ is the process of converting source code written in a high-level programming language into machine code that can be executed by a computer's processor.
10. The _____ is a layer of software that sits between the operating system and the application software, providing a standardized interface for application development.

Q.3 Write a short note on any two of the following terms 10

1. Interpretation vs Compilation

2. Explain type of editors.

3. What is version control?

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**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - IV** **Subject: - Java Programming**

Q.1 Solve Any One 10

1. Write a program to demonstrate Exception Handling Java
2. What is inheritance? Give an example.

Q.2 Fill in the blanks (10 Questions) 10

1. _____ is the process of converting Java source code into bytecode.
2. A _____ is a blueprint for creating objects in Java
3. In Java, a _____ is a special type of method that is called when an object is instantiated
4. The _____ keyword is used to create an instance of a class in Java.
5. Java _____ are reusable blocks of code that perform a specific task.
6. In Java, _____ is a mechanism by which one class is allowed to inherit the features of another class.
7. Java is a _____ programming language that is designed to be platform-independent.
8. _____ is a mechanism in Java that allows a class to have multiple methods with the same name but different parameters.
9. The _____ keyword is used to refer to the current instance of the class.
10. The _____ keyword is used to define a block of code that can be called by other methods, and can perform a particular action.

Q.3 Write a short note on any two of the following terms 10

1. String Handling in Java

2. What is AWT?

3. Explain Serverlets.

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**Adarsh Nagar, D.P.Road-431122**

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**Class:-MMS FY** **Total Marks:-30 Marks**

**Sem - IV** **Subject: - Optimization Techniques**

Q.1 Solve Any One 10

1. Explain the Kuhn-Tucker conditions in nonlinear programming. How do these conditions help in finding the optimal solution for constrained optimization problems?
2. Describe the transportation problem in optimization. What are the steps involved in solving the transportation problem using the Northwest Corner Method?

Q.2 Fill in the blanks (10 Questions) 10

1. _____ is the process of improving the performance of a system by making its components work more efficiently.
2. _____ is a method used to find the best solution to a problem by systematically exploring all possible solutions.
3. In optimization, a _____ is a mathematical function used to evaluate the performance of a solution.
4. _____ is a method used to find an optimal solution by making small, iterative improvements to an initial guess.
5. The _____ is a method used to solve optimization problems by simulating the natural selection process.
6. In optimization, _____ is the process of finding the minimum or maximum value of a function within a given range.
7. _____ is a technique used to solve optimization problems by modeling the problem as a mathematical program.
8. _____ is a method used to solve optimization problems by dividing the search space into smaller regions and eliminating regions that cannot contain the optimal solution.
9. _____ is a technique used to solve optimization problems by modeling the problem as a system of equations and inequalities.
10. _____ is a technique used to solve optimization problems by iteratively adjusting the parameters of a model until the desired outcome is achieved.

Q.3 Write a short note on any two of the following terms 10

1. A small scale industry manufactures two products P and Q which are processed in a machine shop and assembly shop. Product P requires 2 hours of work in a machine shop and 4 hours of work in the assembly shop to manufacture while product Q requires 3 hours of work in machine shop and 2 hours of work in assembly shop. In one day, the industry cannot use more than 16 hours of machine shop and 22 hours of assembly shop. It earns a profit of `3 per unit of product P and `4 per unit of product Q. Give the mathematical formulation of the problem so as to maximize profit.
2. Define constraint programming in the context of optimization. How does it differ from traditional linear and nonlinear programming approaches?
3. Explain the basic concepts of genetic algorithms as an optimization technique. How do selection, crossover, and mutation operators contribute to finding an optimal solution?