

1.DS

1. Introduction to Data Structures, Searching and Sorting

1.1 Understand various types of Data Structures

1.1.1. Define Data Structure and classify them.

1.1.2. Explain Linear Data Structures.

1.1.3. Describe Non-Linear Data Structures.

1.1.4. Explain Data Types and Abstract Data Types.

1.1.5. Explain about Space and Time Complexity.

1.2 Searching and Sorting

1.2.1 Various Sorting Techniques

1.2.1.1 Define Sorting.

1.2.1.2 State the need of Sorting.

1.2.1.3 List the methods of Sorting.

1.2.1.4 Explain the procedure, algorithm, program and time complexity of the following

Sorting techniques:

a) Bubble Sort,

b) Selection Sort,

c) Insertion Sort,

d) Quick Sort, and

e) Merge Sort.

1.2.2 Various Searching Techniques

1.2.2.1 Define searching

1.2.2.2 State the need of searching.

1.2.2.3 List two types of searching.

1.2.2.4 Explain the procedure, algorithm, program and time complexity of the following

⌚ Perform search and replace an element

⌚ C Program with all operations.

2.6. Explain the following for Doubly Circular Linked List.

⌚ Structure

⌚ Creation

⌚ How to represent a node using 'C' Structure

⌚ Perform insertion, deletion, traverse and sort operations

⌚ Perform search and replace an element

⌚ C Program with all operations.

2.7. List the advantages of a Singly Circular Linked List over a Singly Linked List

2.8. Describe the changes require in a singly linked list program to make it the Singly Circular List.

2.9. List the advantages of a Doubly Circular Linked List over a Doubly Linked List

2.10. Describe the changes require in a Doubly Linked List program to make it the Doubly Circular List.

3. Linear Data Structures-Stacks

3.1 Define Stack

3.2 Explain the push, pop and display operations of a Stack

3.3 Explain array implementation of a Stack & its operations.

3.4 Write the program for Array implementation of a Stack & its operations.

3.5 Explain Linked List implementation of a Stack & its operations.

3.6 Write the program for Linked List implementation of a Stack & its operations.

3.7 List the applications of Stacks

3.8 Convert Infix expression to Postfix expression

3.9 Write the program for Conversion of Infix expression to Postfix expression

- 5.6 Define Binary Search Tree
- 5.7 Write differences between Binary Search Tree and Binary Tree
- 5.8 Perform various traversals on Binary Trees
- 5.9 Construct a Binary Tree using In-order and Preorder Traversals
- 5.10 Construct a Binary Tree using In-order and Post-order Traversals
- 5.11 Know the importance of Binary Search Trees over General Trees
- 5.12 Perform insertion, deletion, search and various traversal operations on a Binary Search Tree.
- 5.13 Write the program to implement Binary Search Tree operations.
- 5.14 List the Applications of trees

2.WT

unit -1

- 1.1 Principles of Web Designing and HTML Introduction.
- 1.2 Basic web Terminology.
- 1.3 Describe Anatomy of web page.
- 1.4 Understand different Web page elements.
- 1.5 Navigate through web pages
- 1.6 Narrate steps in building web site
- 1.7 Narrate steps in launching
- 1.8 Narrate maintaining web site.
- 1.9 Introduction and Overview of HTML
- 1.10 Discuss the rules for designing a HTML document.
- 1.11 Explain the structure of HTML document.
- 1.12 Define HTML element and Attribute.

3.6 Differentiate between Client-side and Server-side scripting.

3.7 List Client side and server side scripting languages.

3.8 Describe the features of Java Script.

3.9 Placing JavaScript code in HTML.

3.10 Understand functions

3.11 Know how to define and call a function.

3.12 Know how to pass parameters.

3.13 Understand the purpose of GetElementById method

3.14 Describe the global functions provided by JavaScript.

3.15 Form Handling in Java Script

3.16 Illustrate Arrays

3.16.1 Understand single and multi-dimensional arrays.

3.16.2 Design small programs using arrays.

3.17 Understand about various Objects provided by JavaScript

3.17.1 Math object

3.17.2 String object

3.17.3 Date object

3.17.4 Boolean and Number object

3.18 Describe events in java script.

unit -4

4.1 JavaScript Ajax and JQuery

4.2 Define AJAX

4.3 List the steps for designing a web application using AJAX.

4.4 Explain XMLHttpRequest Object properties and methods of XMLHttpRequest

4.5 Explain sending Ajax request to server and receiving a response from server with

- 5.5 Explain how to combine HTML and PHP.
- 5.6 Explain how to access HTML, PHP documents from web servers.
- 5.7 List various Data types and explain them with examples.
- 5.8 Explain how to declare Variables and Constants.
- 5.9 List and explain string manipulation functions.
- 5.10 Understand Arrays
- 5.11 Explain types of arrays.
- 5.12 Design small programs using arrays.
- 5.13 Explain form handling using \$_GET,\$_POST methods
- 5.14 List and explain mysql database functions in PHP.
- 5.15 Explain the steps of connecting to a Database.
- 5.16 Know about retrieving data from a table.
- 5.17 Know about inserting data into a table.
- 5.18 Know about updating the data in a table.
- 5.19 Know about deleting data from a table.
- 5.20 Design some simple programs to insert, delete, update and retrieve data from database.
- 5.21 Define Cookie.
- 5.22 Know how to create and delete a cookie.
- 5.23 Know the purpose of cookie.
- 5.24 Define Session
- 5.25 Understand how to create a session.
- 5.26 Know how to destroy a session.
- 5.27 Know the purpose of session.
- 5.28 Differentiate Sessions and Cookies.

2.9 Compare classes with structures

2.10 Explain Creation of objects

2.11 Declare and access array of objects

2.12 Explain the concept of passing objects to functions

2.13 Explain the concept of returning objects from functions

2.14 Describe pointers to object

2.15 State the use of pointer object in C++

2.16 Explain the process of declaring an object pointer and accessing data members of it with

an example.

2.17 State the use of 'this' operator

2.18 Explain the operation of dynamic memory allocation using new and delete operators

2.19 Write a program to perform dynamic memory allocations with suitable example.

3.0 Constructors, Destructors and Operator Overloading

3.1 Define constructor and destructor

3.2 Explain Parameterized constructors

3.3 Describe Multiple Constructors in a class

3.4 Describe Constructors with default arguments

3.5 Describe Copy Constructor

3.6 Describe Dynamic constructor

3.7 Define Destructor and develop a program to demonstrate destructors

3.8 Describe Operator Overloading

3.9 Develop programs for Overloading of Binary Operators

3.10 Develop programs for Overloading of Unary Operators

3.11 Develop programs for Overloading of Binary Operators with ordinary member function

count ()

5.6 Explain the need for Templates.

5.7 List types of Templates.

5.8 Describe Function Templates

5.9 Develop a C++ program for Templates with Single Argument Types

5.10 Develop a C++ program to Create function based Templates

5.11 Develop a C++ program for Templates with multiple argument types

5.12 State the use of Class Templates

5.13 Mention the Syntax of Class Template

5.14 Develop a C++ program to Create Classes based on Template

5.15 Develop a C++ program using Class Template for Stack Data Structure

5.16 Develop a C++ program using Class Template for Queue Data Structure

4.java

1.0 Basics of java and overloading

1.1 Describe history and importance of Java in Internet programming.

1.2 Compare Java & C++.

1.3 Explain features of Java.

1.4 Define Byte codes of Java and JVM.

1.5 Give the steps to write and execute a Java program.

1.6 Explain primitive data types of java.

1.7 Describe conversion and casting features.

1.8 Explain one-dimensional and two-dimensional arrays and give example programs.

1.9 Describe how to create classes and objects.

3.1 List different types of I/O streams.

3.2 Explain how to read and write data through console input and output streams and write a

sample program.

3.3 Explain how to use DataInputStream and DataOutputStream to access primitive data types

and write a sample program.

3.4 Explain various file access operations by using File Streams and write a sample program..

3.5 What is a collection framework and Hierarchy of collection framework and write a sample

program.

3.6 Describe ArrayList, LinkedList

3.6.1 Constructors

3.6.2 Methods

3.6.3 Comparisons between above two classes.

3.6.4 Sample programs

3.7 Explain Iterator and List Iterator interface methods and write a sample program.

3.8 Describe List interface and HashSet and HashTable class

3.8.1 Constructors

3.8.2 Methods

3.8.3 Sample programs.

3.9 Describe Map interface and HashMap class for the following

3.8.1 Constructors

5.3 Explain Graphics class methods Update() Paint(),Drawing Lines, Rectangle, circles, polygons

5.4 Describe the process of Working with Color Font classes.

5.5 Describe AWT classes

5.6 Explain how to design Frame window with example.

5.7 Describe Types of Events

5.8 List and explain sources of events.

5.9 List and explain different event classes.

5.10 List and explain event listener interfaces

5.11 Demonstrate event handling mechanism.

5.12 Demonstrate handling mouse events with sample program.

5.13 Demonstrate handling keyboard events with sample program.

5.14 Explain how to use the following AWT controls in applet programming.

a. Labels.

b. Buttons.

c. Text Fields

d. Checkboxes.

e. Lists.

f. Choice

g. Scrollbars.

5.CN

1.0 Introduction to Computer Networks.

2.4.2 Hubs

2.4.3 Switches

2.4.4 Network Interface Cards(NICs)

2.4.5 Routers (CISCO, DAX,Etc.)

2.4.6 Modem (56KBPS Internal or External, ADSLModems.)

2.4.7 Gateways.

2.5 Explain about Wireless network adapter

2.6 List and Explain the functions of LAN Tools

2.6.1 Anti-Magnetic mat

2.6.2 Anti-Magnetic Gloves

2.6.3 Crimping Tool

2.6.4 Cable Tester

2.6.5 Cutter

2.6.6 Loop back plug

2.6.7 Toner probe

2.6.8 Punch down tool

2.6.9 Protocol analyzer

2.6.10 Multi meter

2.7 Explain about Topologies with their merits and de-merits

2.7.1 Bus

2.7.2 Ring

2.7.3 Star

2.7.4 Mesh

4.2.5 Reverse Address Resolution Protocol(RARP)

4.2.6 Telnet

4.3 Describe Simple Network Management Protocol(SNMP)

4.4 Explain about working of SNMP.

4.5 Explain about DHCP, DNS

4.6 Explain the Overview of Network Management.

4.7 Explain Network Monitoring and Troubleshooting.

4.8 Explain about Remote Monitoring (RMON).

5.0 Basic Network administration

5.1 Explain about Network administration.

5.2 Describe the need of Network Administration.

5.3 Responsibilities of Network Administrator.

5.4 Discuss User & Group Managements.

5.5 Analyze the working of Device Manager

5.6 Analyze Verification & Managing Ports.

5.7 Explain the procedure of Installing, Managing & Configuration of Printers,

5.8 Demonstrate Disk Management Tools &Tasks

5.9 Describe File Systems Management.

5.10 Demonstrate on NTFS (File and Folder)

6.0S

1.0 Introduction to operating systems

1.1 Define an operating system

2.9.3 Round Robin

2.9.4 Priority

2.9.5 Multilevel Scheduling

3.0 Synchronization & Deadlocks

3.1 Define Process synchronization

3.2 Describe semaphores

3.3 Explain inter process communication

3.4 Define Deadlock

3.5 State the necessary conditions for arising deadlocks

3.6 State various techniques for deadlock prevention

3.7 Discuss Deadlock avoidance and detection

3.8 Describe the process of recovering from deadlock

4.0 Memory management

4.1 Discuss Memory Hierarchy.

4.2 Describe briefly address binding, dynamic loading, dynamic linking

4.3 Define overlays

4.4 Describe briefly on swapping

4.5 Explain single partition allocation

4.6 Explain multiple partition allocation

4.7 Explain the concept of fragmentation

4.8 Explain paging concept

4.9 Explain how logical address is translated into physical address

4.10 Explain segmentation and segmentation with paging

5.8 List and explain various allocation methods

5.9 List and explain directory structure

5.10 Explain disk organization and structure

7.DBMS

1.0 Concepts of DBMS &RDBMS

1.1 Define Database Management System(DBMS)

1.2 List the advantages of DBMS

1.3 Explain Database Abstraction, Data Independence

1.4 Define Instances and Schemas

1.5 Explain Data Models.

1.6 Define Database languages DDL, DML, TCL

1.7 Explain Database Administrator, Users and Database System Architecture with diagram.

1.8 Define the terms Entity, Entity sets, Relationship, Relationship sets,

1.9 Explain Super Key, Candidate Key and Primary Key, Foreign Key

1.10 Explain Mapping Cardinalities.

1.11 List the symbols used in ER model.

1.12 Explain the Entity-Relationship Model.

1.13 Reduce the ER-diagrams to tables

1.14 Explain Generalization, Specialization &Aggregation.

1.15 Explain Function Dependencies, Normalizations– 1 NF, 2 NF and 3NF

1.16 Explain E.F.CODD's rules for RDBMS

2.0 Concepts of SQL

3.0 PL/SQL

3.1 Explain PL/SQL Block structure.

3.2 List the features of PL/SQL

3.3 Explain the data types of PL/SQL

3.4 Illustrate declarations and naming conventions of variables

3.5 Explain PL/SQL tables and user defined records.

3.6 Explain Input/Output statements.

3.7 Explain decision making statements with examples (IF...
THEN, IF...THEN...ELSE, IF...THEN...ELSE...IF, CASE, GOTO)

3.8 Explain looping statements and illustrate (Simple loop, While loop, For loop).

3.9 Explain procedure with syntax and examples.

3.10 Explain function with syntax and examples.

3.11 Describe the advantages of subprograms.

3.12 Explain handling procedures with example programs.

3.13 Explain handling functions with example programs.

3.14 Explain the parameter modes in PL/SQL with examples (in, out and in out)

3.15 Define Recursion

3.16 Explain Recursion with example programs.

4.0 Advanced PL/SQL

4.1 Define cursor.

4.2 Classify cursors.

4.3 Explain implicit cursor with examples.

5.2 Mongo DB

5.2.1 What is the purpose of mongoDB.

5.2.2 List the advantages of Mongo DB.

5.2.3 Explain the Creation, Dropping, Creation of Collection & Dropping of Collection

of Database in Mongo DB

5.2.4 Explain the Data types of Mongo DB.

5.2.5 Explain Inserting Document, Query Document, Update Document, Deleting

Document & Sorting Document with example

8.DE

1.0 Number systems

1.1 List the various number systems used in digital Computer.

1.2 Explain Decimal number system

1.3 Explain Binary number system

1.4 Explain octal number system

1.5 Explain Hexadecimal number system

1.6 Convert decimal number to other base conversion.

1.6.1 Decimal to Binary

1.6.2 Decimal to Octal

1.6.3 Decimal to Hexadecimal

1.7 Convert binary number to other base conversion.

1.7.1 Binary to Decimal

- 1.11.3 Draw and explain 8421 codes.
- 1.11.4 Draw and explain 2421 code.
- 1.11.5 Draw and explain 8 4-2-1 code.
- 1.11.6 Draw and explain Excess 3 code.
- 1.11.7 Draw and explain Gray code.
- 1.11.8 Explain Character representation
- 1.11.9 List character representation codes
- 1.11.10 Explain the ASCII coding scheme.
- 1.11.11 Explain the EBCDIC coding scheme.

2.0 Boolean Algebra, Logic gates and Basic Combinational Circuits

- 2.1 Define Boolean algebra
- 2.2 Explain AND, OR, NOT operations with truth tables.
- 2.3 Explain the working of EX-OR and EX-NOR operations with truth tables.
- 2.4 List the different postulates in Boolean algebra.
- 2.5 State De-Morgan 's theorems.
- 2.6 Prove De-Morgan's theorems using truth tables.
- 2.7 Apply De-Morgan 's theorems and other postulates of Boolean algebra to simplify the given Boolean expression.
- 2.8 Generate Boolean expression for given truth table.
- 2.9 Use Sum-Of-Products (SOP) method
- 2.10 Use Product-Of-Sums (POS) method
- 2.11 Use K – map to simplify Boolean expression (up to 4 variables).
- 2.12 Use Two variable K-Map, Three variable K-Map and Four variable

- 2.14.4 Define the Full Adder. Explain the function of Full Adder.
- 2.14.5 Construct Full Adder using two Half-Adder and an OR gate
- 2.14.6 Define the parallel Adder
- 2.14.7 Explain the function of parallel Adder using logic symbol.
- 2.14.8 Draw and explain 4-bit parallel adder using full adders.
- 2.14.9 Draw and explain 4-bit parallel adder/ 2's complement subtractor circuit.
- 2.14.10 Explain the working of a serial adder with a block diagram.
- 2.14.11 List the advantage and disadvantages of a serial adder
- 2.14.12 List the advantage and disadvantages of a parallel adder.
- 2.14.13 Distinguish between serial adder and parallel adder.
- 2.14.14 Explain the operation of a digital comparator circuit for two 4-bit words.

3.0 Flip Flops

- 3.1 List the details of different logic families.
- 3.2 Define positive and negative logic levels.
- 3.3 Define Flip flop.
- 3.4 Draw and explain the basic principle of operation of a Flip-flop.
- 3.5 Define Latch.
- 3.6 Explain the working of a NAND latch circuit with truth table and Timing diagram.
- 3.7 Explain the working of a NOR latch circuit with truth table and Timing diagram.
- 3.8 Differentiate between Latch and Flip-flop.

4.1.3 Define Synchronous counter

4.1.4 Define Asynchronous counter

4.1.5 Distinguish between asynchronous and synchronous counters.

4.1.6 Draw and explain module-8 ripple counter circuit diagram with waveforms and truth

tables

4.1.7 Draw and explain module-16 ripple counter circuit diagram with waveforms and truth

tables

4.1.8 Draw and explain module-10 (decade) Asynchronous counter circuit diagram with

Waveforms and truth tables

4.1.9 Draw and explain module-8 synchronous counter circuit diagram with waveforms and

truth tables

4.1.10 Draw and explain module-16 synchronous counter circuit diagram with waveforms and

truth tables

4.1.11 Draw and explain module-10 synchronous counter circuit diagram with waveforms and

truth tables

4.1.12 List the draw backs of ripple counters.

4.1.13 List the advantages of synchronous counters

4.1.14 Explain the operation of a up/down counter circuit diagram with waveforms and truth

5.1 Define data selector and state its importance.

5.2 Define the terms Multiplexer and Demultiplexer.

5.3 Draw and explain the operation of a Multiplexer circuit diagram with truth table.

5.4 Draw and explain the operation of Demultiplexer circuit diagram with truth table.

5.5 List the applications of Multiplexers.

5.6 List the applications of Demultiplexers.

5.7 Define the terms Encoder and Decoder.

5.8 Draw and explain the operation of a 4 to 10 line decoder circuit diagram with truth table.

5.9 Draw and explain the operation of an 8 to 3 encoder circuit diagram with truth table.

5.10 List applications of Decoders.

5.11 List applications of Encoders.

5.12 Define Programmable logic Devices.

5.13 List the types of Programmable logic Devices.

5.14 Draw and explain the Programmable Logic Array (PLA).