

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2024**

DATA STRUCTURES

[Maximum Marks: **100**]

[Time: **3 Hours**]

PART-A

[Maximum Marks: **10**]

I. (Answer **all** questions in one or two sentences. Each question carries **2** marks)

1. Compare Linear and non Linear data structures.
2. Define List in ADT.
3. What is a binary tree?
4. List any two graph representation methods in memory.
5. Define cycle in a graph.

(5 x 2 = 10)

PART-B

[Maximum Marks: **30**]

II. (Answer **any five** of the following questions. Each question carries **6** marks)

1. Explain time complexity of Linear search with an example.
2. List any six application of Stack.
3. Explain the implementation of queue with linked list.
4. Write short note on circular linked list.
5. Write recursive function to calculate the depth of a BST.
6. Explain Threaded binary tree with example.
7. Explain Bubble sort algorithm.

(5 x 6 = 30)

PART-C

[Maximum Marks: **60**]

(Answer **one** full question from each Unit. Each full question carries **15** marks)

UNIT – I

- III. a. Explain prefix, infix and postfix expressions. (6)
- b. Explain algorithm for infix to postfix conversion using stack. (9)

OR

- IV. a. Describe a queue ADT with insert and delete operations. (9)
- b. Write an algorithm for postfix evaluation using stack. (6)

UNIT – II

- V. Explain Linked list ADT with makeEmpty(), printList(), find(), findKth(), insert() and delete(). (15)

OR

- VI. a. Describe the algorithm to implement stack using Linked list ADT. (9)
- b. Write short note on doubly linked list. (6)

UNIT- III

- VII. a. Explain different tree traversal algorithms. (9)
- b. Explain Expression tree with an example. (6)

OR

- VIII. a. Write algorithms for insertion and find operations in BST. (10)
- b. Compare full binary tree and complete binary tree. (5)

UNIT - IV

- IX. a. Write the algorithm for breadth first search (BFS) of a graph. (9)
- b. Explain binary search algorithm. (6)

OR

- X. a. Explain Warshall's algorithm. (6)
- b. Write the algorithm for depth first search (DFS) of a graph. (9)
