

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE , APRIL – 2023**

**DATA STRUCTURES**

(Maximum Marks : 100)

(Time : 3 hours)

**PART – A**  
(Maximum Marks : 10)

Marks

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

1. List different types of expressions.
2. State any two stack operations.
3. Name different types of linked list.
4. Differentiate between the terms siblings and degree of a node.
5. List different types of graph representations.

(5x2=10)

**PART – B**  
(Maximum Marks : 30)

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

1. Explain different data structure and its operations.
2. Explain infix to postfix conversion using Stack ADT.
3. Give the purpose of List ADT methods: find(), makeEmpty(), printList(), findKth(), insert() and delete().
4. Describe the methods of memory allocation and deallocation for nodes.
5. Describe Expression trees and Threaded binary trees.
6. Explain and implement linear search algorithm.
7. Explain graph representations with an example.

(5x6=30)

**PART – C**

(Maximum Marks : 60)

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

**UNIT – I**

- III.** (a) Describe Stack ADT with push() and pop() operations. (9)  
(b) Describe Priority Queue and Dequeue. (6)

**OR**

- IV.** (a) Explain evaluation of postfix expression using stack ADT. (6)  
(b) Describe Queue and its operations – Insert and Delete. (9)

**UNIT – II**

- V.** (a) Explain singly linked list operations : Insertbeg(), Deleteend() and printlist(). (9)  
(b) Describe algorithm for implementing stack with linkedList ADT. (6)

**OR**

- VI.** (a) Describe algorithm for implementing queue with LinkedList ADT. (9)  
(b) Describe about doubly linked lists and circular linked lists. (6)

**UNIT –III**

- VII.** (a) Explain binary search tree and its traversal methods. (9)  
(b) Explain Linked representation of binary tree with an example. (6)

**OR**

- VIII.** (a) Describe Binary Search Tree ADT with insert(), and delete() operations. (9)  
(b) Explain Binary Tree traversal methods. (6)

**UNIT – IV**

- IX.** (a) Explain the following (i) graph (ii) Path (iii) Cycle (iv) out degree. (8)  
(b) Write short notes on Depth first search method. (7)

**OR**

- X.** (a) Implement bubble sort algorithm. (8)  
(b) Explain binary search algorithm. (7)

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