

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2021**

**DATA STRUCTURES**

[Maximum Marks: 75]

[Time: 2.15 Hours]

**PART-A**

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

- I. 1. List basic data structure operations.  
2. Define a Priority Queue.  
3. Describe doubly linked lists.  
4. Define Threaded binary trees.  
5. What is a complete Graph? (3 x 2 = 6)

**PART-B**

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

- II 1. Describe Big-Oh notation with example.  
2. What is Double ended queue? What are the operations on it?.  
3. Describe algorithm for implementing INSERT operation in queue with LinkedList ADT.  
4. Define BST. Draw BST for the elements 50,20,100,30,200,10,150.  
5. What are the three traversal methods in binary trees? Explain each with an example.  
6. List two methods for representing Graphs. Give examples for both.  
7. Write binary search algorithm. (4 x 6 = 24)

**PART-C**

(Answer *any of the three units* from the following. Each full question carries 15 marks)

**UNIT – I**

- III (a) Describe Infix, Prefix, Postfix Expressions with examples. (8)  
(b) Give algorithm for infix to postfix conversion. (7)

**OR**

- IV (a) Define Stack. Give algorithm for PUSH and POP operations in array representation of Stack. (7)
- (b) Give algorithm for insertion and deletion operations in a circular queue. (8)

**UNIT – II**

- V (a) Write algorithm for printing all elements in a linked list. (7)
- (b) Demonstrate the algorithm for deleting first node from a linked list. (8)

**OR**

- VI (a) Explain about implementing queue using linked list. (8)
- (b) Explain the implementation of Stack using Linked List. (7)

**UNIT- III**

- VII (a) What is an Expression Tree? Draw Expression tree for  
(i)  $A*B+C*D$       (ii)  $9*5^2+3$  (8)
- (b) Define Threaded binary tree. Give example. (7)

**OR**

- VIII (a) Write the algorithm for insert () operation in BST. (8)
- (b) Demonstrate the insert () algorithm with an example. (7)

**UNIT - IV**

- IX (a) Give algorithm for DFS in a graph. Explain with example. (9)
- (b) Write a note on Warshall's algorithm. (6)

**OR**

- X (a) Illustrate Quicksort algorithm on the following set of elements.  
3,10,5,2,4,9,8 (9)
- (b) Write the algorithm for liner search. (6)

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