DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE – APRIL -2021.

DATA STRUCTURES

(Maximum Marks : 75)   [Time : 2.15 hours]

PART–A

Marks

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

1. Define Abstract Data Type.

2. Name the data structures that uses the principle of: (i) FIFO (ii)LIFO.

3. What is a circular linked list?

4. Define a binary tree.

5. Give the time complexity of linear search and binary search algorithms.   (3x2=6)

PART - B

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

1. Convert the expression to prefix and postfix forms.

    (A +(B * C) –D) / (E – F)

2. Describe queue and its insert and delete operations.

3. Explain about linked list. Describe the memory allocation and

    de-allocation of nodes.

4.   Explain linked representation of queue and the add operation.

5.   Describe about the linked representation of binary trees with an example.

6.   Define Binary Search Tree. Draw a BST by inserting the values

     25,7,9,40,10,37 in which 25 is the root of the BST.

7.   Explain adjacency matrix representation of graph. Write the adjacency

     matrix of the graph given below.
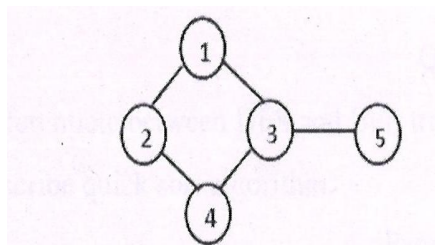
[4x6 =24]

PART - C

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

UNIT I

III   (a)   Explain about stack ADT.   (9)

     (b)   Define data structure. Describe linear and nonlinear data structures.   (6)

OR

IV   (a)   Explain infix to postfix conversion using stack ADT.   (9)

     (b)   Describe insert and delete operations in a circular Queue.   (6)

UNIT- II

V   (a)   Explain the procedure to insert a node into the front and to the

        end of a linked list.   (9)

     (b)   Explain find () and findKth() operations in a List ADT using array.   (6)

OR

VI   (a)   Explain linked representation of stack with add and delete operations.   (9)

     (c)   Describe doubly linked list with insert and delete operations.   (6)

UNIT- III

VII   (a)   Describe the algorithm for insert and find operations in BST ADT.   (9)

     (b)   Explain threaded binary tree with an example.   (6)

OR

VIII   (a)   Write the traversal algorithms in BST ADT.   (9)

     (b)   Explain expression trees and draw the expression tree for the expression.

        $(A * B - C) + (D - E/F)$.   (6)

UNIT – IV

IX   (a)   Describe the terms related to a graph with example.

        (i) Path   (ii) Cycle   (iii) Degree of a vertex   (9)

     (b)   Explain the algorithm for linear search.   (6)

OR

X   (a)   Differentiate between DFS and BFS traversal algorithms in graph.   (9)

     (b)   Describe quick sort algorithm.   (6)

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