N19-00925

TED (15) – 4133

(REVISION — 2015)

Reg. No. ....

Signature ....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2019

DATA STRUCTURES

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

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

1. Define complexity of an algorithm.

2. List four basic data structure operations.

3. Give pictorial representation of a circular linked list.

4. Define a binary tree.

5. Differentiate indegree and outdegree of a directed graph.   (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Define data structure. Compare Linear and Non-linear data structures.

2. Describe a List ADT with find() and printList() functions.

3. Explain a linked list with insertion and deletion of a new node at beginning.

4. Explain linked representation of binary trees.

5. Describe expression trees.

6. Discuss directed and weighted graph.

7. Explain binary search algorithm.   (5×6 = 30)

[116]

Marks

PART — C

(Maximum marks : 60)

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

UNIT — I

III (a) Describe a queue ADT with insert and delete operations.   8

(b) Explain infix, prefix and postfix notations. Using stack, evaluate the postfix expression 2 3, 4 + * 6 −   7

OR

IV (a) Describe a stack ADT with push and pop operations.   8

(b) Explain priority queue and dequeue with suitable examples.   7

UNIT — II

V (a) Explain the algorithm to implement a stack using LinkedList ADT.   8

(b) Describe a doubly linked list. Explain how memory is allocated and deallocated for a linked list node.   7

OR

VI Explain a LinkedList ADT with insert(), delete(), find() and printList() operations.   15

UNIT — III

VII (a) Explain a BST ADT traversal algorithms with a neat diagram.   8

(b) Draw a complete binary tree and explain the following terms.
   (i) degree of a node   (ii) level of a tree
   (iii) depth of a node   (iv) sibling of a node   7

OR

VIII (a) Describe binary search trees. Explain the deletion of a node from BST.   8

(b) Explain threaded binary trees with the help of an example.   7

UNIT — IV

IX (a) Explain adjacency matrix and adjacency list representation of a graph.   8

(b) Explain Warshall's algorithm for all-pairs shortest path.   7

OR

X (a) Explain DFS and BFS graph traversal algorithms.   8

(b) Explain how a set of numbers can be sorted using quick sort method.   7

———————