TED (15) – 4133
(REVISION — 2015)

Reg. No. .....
Signature .....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2018

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. Compare linear and non-linear data structures.
2. Convert A/B-C+D*E to postfix form.
3. List two fields or parts of a node of linked lists.
4. Define degree of a tree.
5. Define path and length of path of graph. $(5 \times 2 = 10)$

PART — B

(Maximum marks : 30)

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

1. Write short notes on time complexity and space complexity.
2. Explain about linked list. Write logic to insert an element at k^{th} position.
3. Write short notes on doubly and circular linked lists.
4. Describe about expression trees and threaded binary trees with simple example figures.
5. Write three cases to delete a node of BST.
6. Explain quick sort algorithm.
7. Explain adjacency matrix and adjacency list representations of graph with an example. $(5 \times 6 = 30)$

[P.T.O.

Marks

PART — C

(Maximum marks : 60)

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

UNIT — I

III (a) Explain the algorithm of infix to postfix conversion using stack ADT. 9

(b) Explain about any three data structure operations. 6

OR

IV (a) Describe stack ADT algorithm with push() and pop() operations. 9

(b) Explain about priority queue and dequeue. 6

UNIT — II

V (a) Describe the algorithm to implement queue using LinkedList ADT. 9

(b) Explain about List ADT operations - find() and PrintList() using array. 6

OR

VI (a) Explain the algorithm to implement stack using LinkedList ADT. 9

(b) Explain algorithms for LinkedList ADT - insert last node and delete last node. 6

UNIT — III

VII (a) Write algorithm to implement three tree traversals using BST ADT. 9

(b) Describe binary tree. Explain about linked representation of binary tree with example. 6

OR

VIII (a) Explain about BST. Write algorithm for insertion and find operations. 9

(b) Describe the terms related to tree - degree of a node, degree of a tree, siblings. 6

UNIT — IV

IX (a) Describe DFS and BFS graph traversals algorithms. 9

(b) Explain binary search algorithm. 6

OR

X (a) Explain about warshall's all-pair shortest path algorithm. 9

(b) Describe the terms related to graph - multi graph, sub graph, directed graph. 6