TED (15) – 4133

(REVISION — 2015)

Reg. No.....

Signature .....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2017

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.

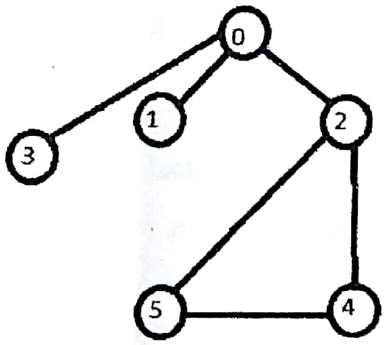
1. List the names of the two types of complexities by which the performance of an algorithm is measured.
2. Define a linked list.
3. What is a circular linked list ?
4. Draw an example of a full binary tree.
5. What is a weighted graph ? (5×2 = 10)

PART — B
(Maximum marks : 30)

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

1. Write the postfix equivalent of the following infix expressions :
   (a) A – B/C + (D-E) (b) (A + B) – C/D/E
2. Compare linear and non-linear data structures.
3. What is a List ADT ? Describe any two methods of a List ADT.
4. Construct a BST by inserting the values 13, 3, 4, 12, 14, 10 and 18 in that order starting with the value 13 at the root of the BST.
5. Write a note on adjacency matrix representation of a graph. Write the adjacency matrix of the graph shown in Figure - 1

Figure -1



[P.T.O.

[53]

Marks

6. Explain the linked representation of a binary tree.

7. Write a note on :
   (a) Binary search (b) Bubble sort (5×6 = 30)

PART — C

(Maximum marks : 60)

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

UNIT — I

III (a) Explain the evaluation of a postfix expression using stack. 7

(b) Write the algorithms for insertion and deletion of an element of a circular queue. 8

OR

IV (a) Write a note on :

(i) Big O notation (ii) Dequeue
(iii) Prefix expression (iv) ADT 12

(b) What is meant by traversal of a data structure ? 3

UNIT — II

V (a) Explain the implementation of stack using Linked List. 9

(b) Write the algorithm for 'printList()' operation of List ADT using array. 6

OR

VI (a) Write the algorithms for removing the head node and tail node of a linked list. 8

(b) Write the algorithm for the 'Insert' operation of a linked list. 7

UNIT — III

VII (a) Write algorithm for preorder and postorder traversal of a BST. 8

(b) Describe threaded binary tree showing an example. 7

OR

VIII (a) Describe the 'find' operation of a BST. 7

(b) Describe the 'insertion' operation of a BST. 8

UNIT — IV

IX (a) Write the algorithm for breadth-first-search (BFS) of a graph. Write the order in which nodes are visited by applying DFS on the graph shown in Figure -1 starting with node 0. 9

(b) Write a note on Linear search. 6

OR

X (a) Write a note on Warshall's algorithm. 6

(b) Write the algorithm for depth-first-search (DFS) of a graph. Write the order in which nodes are visited by applying DFS on the graph shown in Figure -1 starting with node 0. 9