



TED (15) – 4133

Reg. No.....

(REVISION — 2015)

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 ?

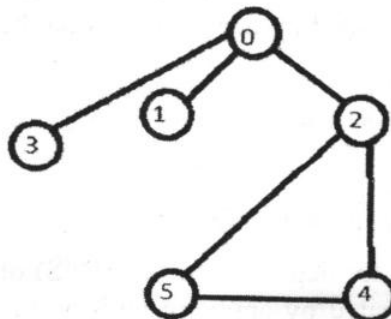
(5×2 = 10)

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





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