

Roll No. ....

Total Pages : 2

**8492**

**BT-3/D07**

**DATA STRUCTURES**

Paper-CSE-203E

Opt. (i)

Time : Three Hours]

[Maximum Marks : 100

**Note :** Attempt *five* questions in all, selecting at least *one* question from each unit.

**UNIT-I**

1. (a) Explain Static and Dynamic implementation of data structures, giving suitable examples. Also discuss their advantages and disadvantages. 12  
(b) What is an array ? Differentiate between one-dimensional and two-dimensional arrays. Also write the usefulness of an array. 8
2. (a) Convert  $X : A + (B * C - (D / E - F) * G) * H$  into POSTFIX form showing stack status after every step in tabular form. 12  
(b) Write an algorithm that translates an INFIX expression to PREFIX expression. 8

**UNIT-II**

3. (a) What is a circular queue ? Explain its implementation using arrays. Write algorithms to perform insertion and deletion operations on it. 14  
(b) Discuss priority queues and their applications. 6
4. (a) Write an algorithm to insert a new item at the end of a linked list. 4



- (b) What do you mean by Doubly linked lists ? What are the various operations that can be performed on it ? Write algorithms to insert an element in a doubly linked list. 10
- (c) Write short note on Linked implementation of stacks. 6

### UNIT-III

5. (a) Write an algorithm for traversing a binary tree in pre-order. 7
- (b) Explain linked implementation of trees. How is it better than array implementation ? 7
- (c) Define the following terms :  
 (i) Depth.  
 (ii) Level.  
 (iii) Almost complete binary tree. 6
6. (a) Insert the following elements in an AVL tree in alphabetical order :  
 March, May, Nov., Aug., April, Jan., Dec., July, Feb., June, Oct. & Sept. 15
- (b) Write short note on B-trees. 5

### UNIT-IV

7. (a) Explain the following :  
 (i) Directed graph & Weighted graph.  
 (ii) Representation of graphs.  
 (iii) Kruskal's algorithm. 12
- (b) Write an algorithm for depth-first graph traversal. 8
8. (a) Write an algorithm for heap sort giving suitable example. 12
- (b) What is Quick sort ? How does it differ from Bubble sort ? 8