

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

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[P.T.O.]

- (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