

Roll No.

Total Pages : 2

43139

BT-3/D-24

DATA STRUCTURE AND ALGORITHMS

Paper : PC-CS-201A

Time : Three Hours]

[Maximum Marks : 75

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

UNIT-I

1. (a) Write a program to implement Binary Search on a one-dimensional array. 7
(b) Explain the concept of data structures, differentiating between built-in and user-defined data structures. Discuss their applications in real-world scenarios. 8
2. Explain Bubble Sort algorithm and Quick sort algorithm in detail with suitable example also write their time complexities. 15

UNIT-II

3. Elaborate stack and different operations of stack. Write a program to evaluate a postfix expression using a stack. Explain with suitable example. 15
4. Explain queues and its types. Write algorithms for insertion and deletion in circular queue with suitable examples. 15

43139/1200/KD/1179

**[P.T.O.
31/12**

UNIT-III

5. (a) Differentiate static and dynamic implementations of data structures. 7
- (b) Explain the doubly linked list and its operations. 8
6. Discuss the implementation of stacks and queues using linked lists. Explain algorithms for insertion and deletion operations for both data structures. 15

UNIT-IV

7. (a) Elaborate the process of insertion and deletion in a BST with algorithms and time complexity analysis. 8
- (b) Explain AVL trees and its operations in detail with suitable example. 7
8. What is a minimum spanning tree? Explain Kruskal's or Prim's algorithm for finding the minimum spanning tree and write a program for its implementation. 15
-