Roll No. ....   Total Pages : 2

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

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