BT-4/J-22                          **44154**

DESIGN AND ANALYSIS OF ALGORITHMS
Paper : PC-CS208A

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)  What do you understand by a recurrence? Write a detailed note on the substitution method for solving a recurrence.

    (b)  Discuss the concepts of asymptotic notations and its properties.

2.  What do you understand by time complexity? What is Big O notation? Write the Quick Sort algorithm and discuss its time complexity.

## UNIT–II

3.  What do you understand by dynamic programming? Discuss using the example of matrix chain multiplication.

4.  What is a Huffman code? Discuss the greedy algorithm for constructing the Huffman code.

## UNIT–III

5. What is minimum spanning tree? Discuss the Steps for finding Minimum Spanning Tree using Prim's Algorithm.

6. Discuss Bellman-Ford algorithm that computes shortest paths from a single source vertex to all of the other vertices in a weighted digraph.

## UNIT–IV

7. What is a bitonic sequence? Discuss bitonic sort algorithm and its time complexity.

8. What is a sorting network? Discuss the structure of bubble sorting network.

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