

Roll No. 8820889

Total Pages : 2

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.
-