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BT-5 / D-17

DESIGN AND ANALYSIS OF ALGORITHMS

Paper–CSE-305N

Time allowed : 3 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 mean by algorithm? How to analyze the complexity of an algorithm? Explain using suitable examples.

   (b) What is recurrence relation? How does it help in finding the complexity of programs? How to solve recurrence relation using recursion tree method? Explain.

2. What is Divide and Conquer? Explain merge sort and its analysis using suitable example.

Unit–II

3. (a) What is dynamic programming? Explain matrix chain multiplication problem and its solution using dynamic programming using suitable example.

   (b) What is greedy method? "Does it always return a optimized solution for every problem." Explain.

4. What is a Backtracking technique? Solve Graph-coloring problem using backtracking problem and also analyze the solution complexity.

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Unit–III

5. (a) What do you mean by graph traversal? Differentiate between different traversal methods using suitable examples.

   (b) What do you understand by Minimum spanning tree? Explain Kruskal's algorithm to find a MST for any graph using suitable example.

6. What is shortest path in a graph? Explain Dijkstra's algorithm to find the shortest path between nodes of following graph edge list:

Start Edge	End Edge	Weight
A	B	2
A	D	6
B	D	3
B	C	1
C	E	2
D	E	1

Unit–IV

7. (a) What do you understand by Computational complexity? Explain the P and NP classes using suitable examples.

   (b) What is a flow network? Explain the applications of flow networks and also explain how to solve these networks.

8. Write detailed notes on following:

   (a) Sorting networks

   (b) Merging networks

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