Code No: R1932053 **R19** **SET - 1**

III B. Tech II Semester Supplementary Examinations, November-2022

DESIGN AND ANALYSIS OF ALGORITHMS

(Computer Science and Engineering)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

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UNIT-I

1. a) Define time complexity? Explain time complexity of insertion sort in different cases. [8M]
   b) Explain Amortized analysis with example. [7M]

(OR)

2. a) What is biconnected graph? How to determine biconnected components of graph? [8M]
   b) Write the procedures for Union and Find Algorithms. [7M]

UNIT-II

3. a) Sort the records with the following index values in the ascending order using quick sort algorithm: 98 12 56 85 22 33 44 88 77. [8M]
   b) Discuss in detail about Divide and Conquer method with suitable examples. [7M]

(OR)

4. a) Explain in detail job sequencing with deadlines problem with example. [8M]
   b) Describe the Knapsack problem using greedy method. [7M]

UNIT-III

5. a) Solve the following 0/1 Knapsack problem using dynamic programming P = (11, 21, 31, 33), W = (2, 11, 22, 15), C = 40, n = 4. [8M]
   b) Write and explain an algorithm to compute the all pairs shortest path using dynamic programming and prove that it is optimal. [7M]

(OR)

6. a) Discuss the time and space complexity of Dynamic Programming traveling sales person algorithm. [8M]
   b) Explain the matrix chain multiplication with an example. [7M]

UNIT-IV

7. a) What is a Hamiltonian Cycle? Explain how to find Hamiltonian path and cycle using backtracking algorithm. [8M]
   b) Explain the Graph–coloring problem. And draw the state space tree for m = 3 colors n = 4 vertices graph. Discuss the time and space complexity. [7M]

(OR)

8. a) Explain subset-sum problem and discuss the possible solution strategies using backtracking. [8M]
   b) How to search an answer node in branch and bound using Least Cost Search? Explain. [7M]

UNIT-V

9. a) Compare and contrasts between NP-HARD and NP-COMPLETE. [8M]
   b) Briefly explain Cooks-theorem. [7M]

(OR)

10. a) Explain The Naive String Matching Algorithm with example. [8M]
    b) Explain about Tries with examples. [7M]

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