Code No: R1632053 **R16** SET - 1

III B. Tech II Semester Supplementary Examinations, November - 2019

DESIGN AND ANALYSIS OF ALGORITHMS

(Computer Science and Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A (14 Marks)

1. a) What is an Algorithm? [2M]
   b) Describe the Algorithm Analysis of Binary Search. [2M]
   c) State the Job – Sequencing with Deadline Problem. [2M]
   d) Define i) Principles of optimality, ii) Feasible solution, iii) Optimal solution. [3M]
   e) Define Chromatic number and give the state space tree for 4 – coloring problem. [3M]
   f) Distinguish between fixed–tuple sized and variable tuple sized state space tree organization. [2M]

PART –B (56 Marks)

2. a) Give the algorithm for addition of two matrices and determine the time complexity of this algorithm by frequency – count method. [7M]
   b) Discuss the Pseudo code conventions for expressing algorithms. [7M]

3. a) Write Divide – And – Conquer recursive Merge sort algorithm and derive the time complexity of this algorithm. [7M]
   b) Write the general method of Divide – And – Conquer approach. [7M]

4. a) Explain the general principle of Greedy method and also list the applications of Greedy method. [7M]
   b) What is a Spanning tree? Explain Prim's Minimum cost spanning tree algorithm with suitable example. [7M]

5. a) Explain Reliability Design problem with suitable example. [7M]
   b) Describe the Dynamic 0/1 Knapsack problem. Find an optimal solution for the dynamic programming 0/1 knapsack instance for n=3, m=6, profits are (p1, p2, p3) = (1, 2, 5), weights are (w1, w2, w3)=(2, 3, 4). [7M]

6. a) What is a Hamiltonian Cycle? Explain how to find Hamiltonian path and cycle using backtracking algorithm? [7M]
   b) Discuss the 4 – queen's problem. Draw the portion of the state space tree for n = 4 queens using backtracking algorithm. [7M]

7. a) Give the 0/1 Knapsack LCBB algorithm. Explain how to find optimal solution using variable – tuple sized approach? [7M]
   b) Distinguish between backtracking and branch – and bound techniques. [7M]

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