

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**

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 $(p_1, p_2, p_3) = (1, 2, 5)$, weights are $(w_1, w_2, w_3) = (2, 3, 4)$. [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]
