

**GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN**

(Autonomous)

(Affiliated to Andhra University, Visakhapatnam)

II B.Tech. - II Semester Regular Examinations, April – 2026**DESIGN AND ANALYSIS OF ALGORITHMS**

[Common to CSE, CSE (AI&ML) & INF]

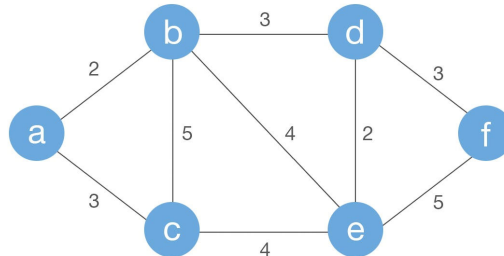
1. All questions carry equal marks
2. Must answer all parts of the question at one place

Time: 3Hrs.**Max Marks: 70****UNIT-I**

1. a. Describe the characteristics of Pseudo code. Write a pseudo code to find the factorial of given number and find the time complexity. [7M]
b. Explain how the amortized cost is used in performance analysis with an example. [7M]
- OR
2. a. Discuss the Asymptotic Notations and give an example for each type. [7M]
b. Compare the prior and posterior analysis in performance analysis. [7M]

UNIT-II

3. a. Explain the Divide and Conquer approach. Solve the recursive equation Given below [7M]
 $T(n) = 2T(n/2) + O(n)$
b. Compute the time complexity of quick sort for best, worst and average cases, [7M]
- OR
4. a. Compute the optimal solution for the knapsack problem using the greedy method $N=3$, $M=20$, $(p_1, p_2, p_3) = (25, 24, 15)$, $(w_1, w_2, w_3) = (18, 15, 10)$ [7M]
b. Apply the Minimum-Cost Spanning Trees algorithm on the given graph to find the Optimal cost. Source is a. [7M]

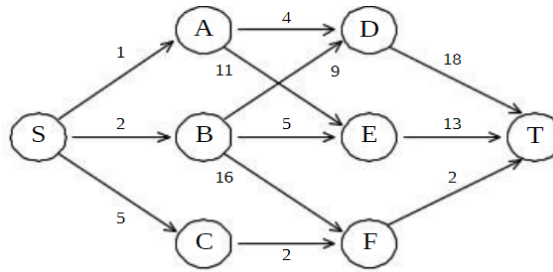
**UNIT-III**

5. a. Explain the Dynamic Programming with the general methodology and list the applications of dynamic programming. [7M]
b. Apply Dynamic Programming to solve the Traveling Salesman Problem (TSP) for The following cost matrix to find the optimal solution. [7M]

0	10	15	20
5	0	9	10
6	3	0	12
8	8	9	0

OR

6. a. Discuss Optimal binary search using dynamic programming to find the optimal solution. [7M]
- b. Find the optimal solution for the given multi-stage graph using dynamic programming [7M]



UNIT-IV

7. a. Explain N*N Queen problem? Draw the state solution state space tree for 4*4 Queen. [7M]
- b. Discuss the graph coloring problem and identify the time complexity for graph coloring using backtracking. [7M]

OR

8. a. Discuss the Sum of subset Problem. Draw the solution space tree to solve the problem below and obtain the optimal solution. $M=30$, $S = \{5,10,12,13,15,18\}$. [7M]
- b. Explain Hamiltonian cycles in detail with an example. [7M]

UNIT-V

9. a. Explain the searching strategies of Branch and Bounding in detail with an example. [7M]
- b. Design 0/1 Knapsack Problem by using LC BB to retrieve the optimal solution for the given problem. $M=15$, Profits (10,10,12,18), Weights (2,4,6,9) [7M]

OR

10. a. Compare and contrast the Deterministic algorithm and the non-deterministic algorithm [7M]
- b. Explain the Cook's theorem. [7M]