SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year I Semester Regular Examinations February-2025
ADVANCED DATA STRUCTURES & ALGORITHM ANALYSIS
(Common to CSE, CIC, CCC, CAI, CSM & CAD)

Time: 3 Hours   Max. Marks: 70

PART-A
(Answer all the Questions 10 x 2 = 20 Marks)

1	a	Simplify steps involved in performance analysis.	CO1	L2	2M
	b	What is B-Tree? Give one example.	CO1	L1	2M
	c	Define Heapify.	CO2	L1	2M
	d	Construct Strassen's 2×2 matrix.	CO2	L3	2M
	e	What is Spanning Tree?	CO3	L1	2M
	f	Define Job sequencing with deadlines.	CO3	L1	2M
	g	What is Graph coloring?	CO4	L1	2M
	h	State the Container problem.	CO4	L2	2M
	i	What are NP complete and NP Hard?	CO5	L1	2M
	j	What is non-deterministic problem?	CO5	L1	2M

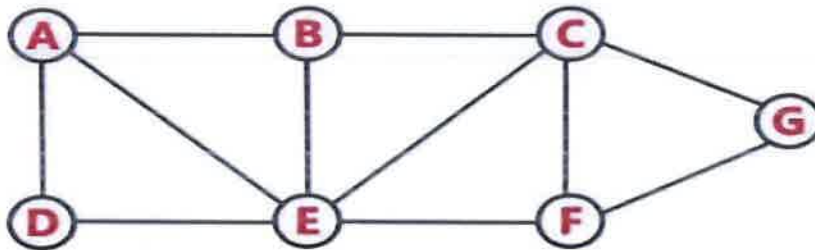## PART-B
(Answer all Five Units 5 x 10 = 50 Marks)
UNIT-I

2	a	Analyze space complexity and time complexity in detail with example.	CO1	L4	5M
	b	Illustrate an algorithm for Finding sum of natural number.	CO1	L2	5M

OR

3	Construct an AVL Tree by inserting numbers from 1 to 8.	CO1	L6	10M

UNIT-II

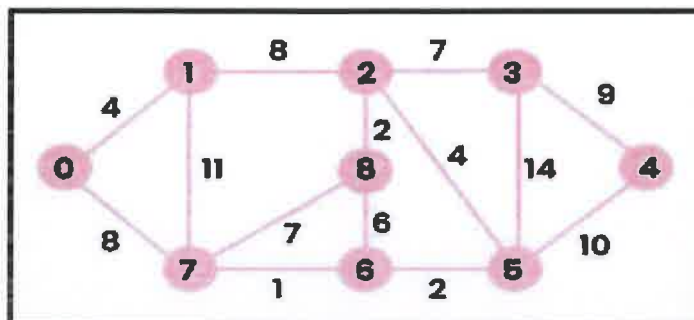|				
4	Draw the Spanning Tree for the given graph using DFS and BFS algorithm.	CO2	L6	10M

OR

5	Summarize an algorithm for quick sort. Provide a complete analysis of quick sort for given set of numbers 12, 3, 18, 21, 4, 55, 64, 77and 76.	CO2	L3	10M

UNIT-III

6	Implement the Single Source Shortest Path using Dijkstra's algorithm for the given graph.	CO3	L6	10M

OR

7	a	Explain 0/1 knapsack problem by using dynamic programming with an examples.	CO3	L2	5M
	b	Measure the String Editing problem with example.	CO3	L5	5M

UNIT-IV

8	a	Consider a set S= {5,10,12,13,15,18} and d=30. Solve it for obtaining Sum of Subset using Backtracking method.	CO4	L5	5M
	b	Describe how the backtracking method is applied to solve the 8-Queens problem.	CO4	L6	5M

OR

9	Simplify 0/1 knapsack problem and design an algorithm of LC Branch and Bound and find the solution for the knapsack instance of n = 4,(p1, p2, p3, p4) = (10, 10, 12, 18), (w1,w2, w 3, w4) = (2, 4, 6, 9) and M = 15.	CO4	L4	10M

UNIT-V

10	State and Explain Cook's theorem.	CO5	L2	10M

OR

11	a	Explain Scheduling Identical Processors in NP Hard Scheduling Problem.	CO5	L4	5M
	b	Describe Job Shop Scheduling in NP Hard Scheduling Problem.	CO5	L2	5M

*** END ***