Q.P.Code: 23CS0507 | R23 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year I Semester Regular & Supplementary Examinations November-2025

ADVANCED DATA STRUCTURES & ALGORITHM ANALYSIS

(Common to CSE, CIC, CCC, CIA, 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	L2	2M
	d	Construct Strassen's 2x2 matrix.	CO2	L3	2M
	e	What is Spanning Tree?	CO3	L1	2M
	f	Define Job sequencing with deadlines.	CO3	L2	2M
	g	Solve 4-Queens problem.	CO4	L2	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

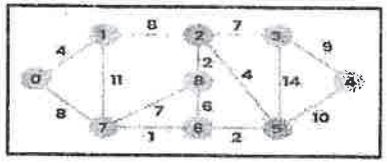
2	a	Discuss the factors affecting the time complexity.	CO1	L3	5M
	b	Illustrate an algorithm for Finding sum of natural number.	CO1	L3	5M
		OR			
3	a	Compare between Priori analysis and Posteriori analysis.	CO1	L5	5M
	b	Write the applications and Operations of the B-Tree.	CO1	L3	5M

UNIT-II

4	a	Explain in detail about operations of Heap Tree.	CO2	L2	5M
	b	Define Connected components and Bi-connected components along with applications.	CO2	L1	5M
		OR			
5	a	Explain Graph representations with suitable example.	CO2	L2	5M
	b	Compare between Min heap and Max heap.	CO2	L5	5M

UNIT-III

6	a	Implement the single source shortest path using dijkstra's algorithm for the given graph	CO3	L4	5M



	b	Discuss about Optimal binary search tree with suitable example.	CO3	L2	5M
		OR			
7	a	Build any one application of dynamic programming with an example.	CO3	L6	6M
	b	Measure the String Editing problem with example.	CO3	L5	4M

UNIT-IV

8	a	Explain the principles of FIFO branch and bound.	CO4	L3	6M
	b	Describe the general method of branch and bound.	CO4	L1	4M
		OR			
9	a	Consider a set S={5,10,12,13,15,18} and d=30. Solve it for obtaining sum of subset using Back tracking method.	CO4	L6	5M
	b	Analyze the least cost search approach in branch and bound.	CO4	L4	5M

UNIT-V

10	a	State and Explain Cook's theorem.	CO5	L2	5M
	b	Describe Job Shop Scheduling in NP Hard Scheduling Problem.	CO5	L1	5M
		OR			
11	a	Construct the non-deterministic algorithms with suitable example	CO5	L3	5M
	b	Explain why Clique Decision Problem is NP-Hard. Explain.	CO5	L4	5M

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