Code No: R22A6617 **R22**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Regular Examinations, November 2024

Design and Analysis of Computer Algorithms

(CSE-AIML & B.Tech-AIML)

Roll No										

Time: 3 hours **Max. Marks: 60**

Note: This question paper contains two parts A and B
Part A is compulsory which carries 10 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

		PART-A (10 Marks) **(Write all answers of this part at one place)**	**BCLL**	**CO(s)**	**Marks**
1	A	What is the Big-O time complexity?	**L1**	**CO-I**	**[1M]**
	B	Why is Strassen's algorithm not always used in practical applications?	**L2**	**CO-I**	**[1M]**
	C	What is an articulation point in a graph?	**L4**	**CO-II**	**[1M]**
	D	What is the greedy method?	**L1**	**CO-II**	**[1M]**
	E	What is the Matrix Chain Multiplication?	**L2**	**CO-III**	**[1M]**
	F	Define 0/1 Knapsack Problem?	**L1**	**CO-III**	**[1M]**
	G	What is the Sum of Subsets Problem?	**L1**	**CO-IV**	**[1M]**
	H	What is the Graph Coloring Problem?	**L4**	**CO-IV**	**[1M]**
	I	What is the Find operation in disjoint sets?	**L3**	**CO-II**	**[1M]**
	J	What is the LC Branch and Bound approach?	**L1**	**CO-V**	**[1M]**
		PART-B (50 Marks)			
		SECTION-I			
2	A	Define Merge sort with example?	**L1**	**CO-I**	**[5M]**
	B	What is pseudo-code? Explain with an example?	**L2**	**CO-I**	**[5M]**
		OR			
3	A	Describe Quick Sort with suitable example?	**L3**	**CO-I**	**[5M]**
	B	Discuss the concepts of asymptotic notations and its properties?	**L5**	**CO-I**	**[5M]**
		SECTION-II			
4	A	Explain knapsack problem in Greedy method?	**L1**	**CO-II**	**[5M]**
	B	Explain the Travelling sales man problem?	**L2**	**CO-II**	**[5M]**
		OR			
5	A	Explain Kruskal's Minimum cost spanning tree algorithm with suitable example?	**L2**	**CO-II**	**[5M]**
	B	Describe job scheduling with deadlines?	**L4**	**CO-II**	**[5M]**
		SECTION-III			
6	A	Explain optimal binary search tree with an example?	**L1**	**CO-III**	**[5M]**
	B	What is dynamic programming, and how does it differ from the greedy method and divide and conquer?	**L6**	**CO-III**	**[5M]**

		OR			
7	A	Explain Matrix chain multiplication in dynamic programming?	**L2**	**CO-III**	**[5M]**
	B	What is the All Pairs Shortest Path (APSP) problem?	**L4**	**CO-III**	**[5M]**
		SECTION-IV			
8	A	Provide an example graph and use backtracking to find a Hamiltonian cycle?	**L2**	**CO-IV**	**[5M]**
	B	What is the N-Queens Problem, and how is it solved using backtracking?	**L3**	**CO-IV**	**[5M]**
		OR			
9	A	Compare and contrast between connected components and bi connected components?	**L5**	**CO-IV**	**[5M]**
	B	What is the Sum of Subsets Problem, and how is it solved using backtracking?	**L2**	**CO-IV**	**[5M]**
		SECTION-V			
10	A	What is a non-deterministic algorithm, and how does it differ from a deterministic algorithm?	**L2**	**CO-V**	**[5M]**
	B	How are P and NP problems related?	**L5**	**CO-V**	**[5M]**
		OR			
11	A	Draw the portion of state space tree generated by LCBB for the following instance of 0/1 knapsack n= 5, M=12, (p1, ……p5) = (10,15,6,8,4) (w1, ...w5)=(4,6,3,4,2	**L3**	**CO-V**	**[5M]**
	B	Explain FIFO Branch and Bound solution?	**L1**	**CO-V**	**[5M]**

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