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Code No.: CS501PC | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE:: HYDERABAD
UGC AUTONOMOUS
III–B.TECH–I–Semester End Examinations (Supply) - December- 2024

DESIGN AND ANALYSIS OF ALGORITHMS
(Common for CSE, IT, CSC, CSD, AI&DS)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks.

PART-A **(20 Marks)**

1.	a)	List out the properties of the algorithm.	[2M]
	b)	Analyze time complexity of quick sort.	[2M]
	c)	What is Collapsing Rule?	[2M]
	d)	Define n-Queens Problem.	[2M]
	e)	What is travelling sales person problem?	[2M]
	f)	Define knapsack problem.	[2M]
	g)	Give two real time problems that could be solved using greedy algorithm	[2M]
	h)	What is job sequencing with deadlines?	[2M]
	i)	Write the statement of Cook's theorems.	[2M]
	j)	Define NP – complete problem.	[2M]

PART-B **(50 Marks)**

2. Find Big-oh notation and Little-oh notation for f(n) = 7n3+ 50n2+200. [10M]

OR

3. Explain Strassen's Matrix multiplication with example. [10M]

4. Determine weighted union and collapsing find algorithm With an Example. [10M]

OR

5. Write short notes on [10M]
   (i) Graph coloring.
   (ii) 8-Queens problem.

6. Illustrate Reliability Design problem with an example. [10M]

OR

7. Find the optimal solution for the given instance of 0/1 knapsack problem. n=7,m=15, (p1, p2, p3, p4, p5, p6,p7)=(10,5,15,7,6,8,3) (w1, w2, w3,w4, w5,w6,w7)= (2,3,5,7,1,4,1) Find the optimal solution for i. Maximum profit. ii. Minumum weight [10M]

8. Explain kruskal's algorithm with an example. [10M]

OR

9. Compare Divide and Conquer approach and greedy method. [10M]

10. Explain the P, NP, NP-Hard and NP- complete classes? Give relationship between them. [10M]

OR

11. Compare Backtracking and Branch and Bound method. [10M]

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