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

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
III–B.TECH–I–Semester End Examinations (Regular) - January- 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)	Compute time complexity of Merge sort.	[2M]
b)	Define Divide and Conquer.	[2M]
c)	What is collapsing Rule?	[2M]
d)	Define n-Queens Problem.	[2M]
e)	What is dynamic programming?	[2M]
f)	What is optimal binary search tree?	[2M]
g)	Give two real time problems that could be solved using greedy algorithm.	[2M]
h)	What is job sequencing?	[2M]
i)	List the properties of LC-Search.	[2M]
j)	Compare P and NP.	[2M]

PART-B **(50 Marks)**

2. To construct how quick sort sorts the following sequences of keys in ascending order. [10M]
31,57,33,12,99,77,55,66,54,21,32.

OR

3. What is meant by time complexity? Define different time complexity notations. Give examples one for each? [10M]

4. Apply Backtracking technique to solve the following instance of the sum of sub sets problems w={5,7,10,12,15,18,20} & m=35. [10M]

OR

5. What are Sets? How are they represented? Explain various operations on Disjoint Sets. [10M]

6. Explain about all pairs-shortest paths algorithm and analyz its efficiency? [10M]

OR

7. Describe the Knapsack problem using greedy method. [10M]

8. Explain about single source shortest path algorithm? [10M]

OR

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

10. Find out solution for knapsack problem using LC and FIFO Branch and Bound with an example. [10M]

OR

11. Briefly explain the concepts of the NP-Hard and NP Complete? [10M]

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