Code No.: AI405PC | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–II–Semester End Examinations (Supply) - February- 2024
DESIGN ANALYSIS OF ALGORITHMS
(CSM)

[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 and may have a, b, c as sub questions.

PART-A **(20 Marks)**

1. a)	Explain about Big-oh notation.	[2M]
b)	How can we measure an algorithm's running time?	[2M]
c)	Define static Space Tree.	[2M]
d)	Give brief note on Graph Coloring.	[2M]
e)	What you mean by Dynamic Programming?	[2M]
f)	Explain about Optimal Binary Search Tree (OBST).	[2M]
g)	What is Greedy method?	[2M]
h)	Explain about Minimum Cost Spanning Trees.	[2M]
i)	Define Branch and Bound technique.	[2M]
j)	Explain about non-deterministic algorithms.	[2M]

PART-B **(50 Marks)**

2.a)	What is Space Complexity? Explain with suitable examples.	[5M]
b)	Write and explain recursive algorithm of Binary Search method.	[5M]
	OR	
3.a)	What is stable Sorting Method? Is Merge sorting a stable sorting method? Justify your answer.	[5M]
b)	Explain Quick Sort algorithm and trace this algorithm for n =8 elements: 24,12,35,23,45,34,20,48.	[5M]
4.	How to implement Disjoint sets? Explain with examples.	[10M]
	OR	
5.	Give the solution to the 8-Queens problem using Backtracking method.	[10M]
6.	With the help of suitable example explain the All Pairs Shortest Path problem.	[10M]
	OR	
7.	Use the function OBST to compute w(i, j), r(i, j), and c(i, j), $0 \le i < j \le 4$, for the identifier set (a1, a2, a3, a4) = (do, if, int,while) with p(1:4) = (3, 3, 1, 1) and q(0:4) = (2, 3, 1, 1, 1). Using the r(i, j)'s construct the Optimal Binary Search Tree.	[10M]
8.	State the Job – Sequencing with deadlines problem. Find an optimal sequence to the n = 5 Jobs where profits (P1, P2, P3, P4, P5) = (20, 15, 10, 5, 1) and deadlines (d1, d2, d3, d4, d5) =(2, 2, 1, 3, 3).	[10M]
	OR	
9.	Explain about Single Source Shortest Path problem in Greedy method.	[10M]
10.	Describe LC Branch and Bound solution of 0/1 Knapsack problem in detail with an example.	[10M]
	OR	
11.	State and prove the Cook's theorem.	[10M]

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