20A3242401

III B. Tech. II Semester Regular Examinations, March-2023
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE(AIML) and CSE(DS))
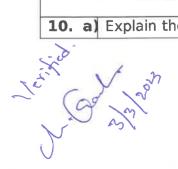
Time: 3 Hours   **Max. Marks: 70**

-Question paper contains **FIVE** units
Answer one question from each unit
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Q.No.	Questions	Marks	BTL
	UNIT I		
1. a)	Define algorithm. Explain the characteristics of an algorithm.	7M	2
b)	Write an algorithm for finding the maximum element in an array of elements and show its time complexity.	7M	2
	OR		
2. a)	Write recursive algorithm to find out nth Fibonacci number.	7M	3
b)	What is space complexity? With suitable example, explain how it is computed.	7M	2
	UNIT II		
3. a)	Briefly explain Merge Sort Algorithm with suitable example and Derive its Time Complexity.	7M	2
b)	Design algorithms for simple union and find operations. Also discuss problems associated with these algorithms.	7M	3
	OR		
4. a)	Sort the records with the following index values in ascending order using quick sort algorithm. 65,70,75,80, 33, 60,55, 22, 50,45, 11	7M	3
b)	Show how binary search algorithm works for searching 151, -14 and 9 in the following set of elements: -15, -6, 0, 7, 9, 23, 54, 82, 101, 112, 125, 131, 142, 151	7M	3
	UNIT III		
5.	Explain the Job Sequencing with deadlines problem with appropriate example.	14M	2
	OR		
6. a)	Describe single source shortest path algorithm with an example.	7M	2
b)	Differentiate between prim's and Kruskal's algorithms.	7M	2
	UNIT IV		
7.	Construct the OBST with the identifier set(a1,a2,a3,a4) = (end, goto, print, stop) with (P1,P2,P3,P4) = (0.5,0.1,0.02,0.5) & (Q1,Q2,Q3,Q4,Q5)= (0.5,0.15,0.2,0.1,0.2) Also compute the cost of the tree.	14M	3
	OR		
8. a)	Consider three stages of a system with r1=0.3, r2=0.5, r3=0.2 and c1=30, c2=20, c3=30 Where the total cost of the system is C=80 and u1=2, u2=3, u3=2 find the reliability design.	7M	3
b)	Write an algorithm for matrix chain multiplication problem using dynamic programming.	7M	2
	UNIT V		
9. a)	Write an algorithm for graph colouring with an example using backtracking method.	7M	2
b)	Define the terms Branch and Bound. Explain about its general method.	7M	2
	OR		
10. a)	Explain the principles of (a) Bounding. (b) FIFO Branch & Bound.	14M	2

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