H.T No

Regulations: A20

(An Autonomous Institution)

Code No:8FC05 **Date: 20-August-2024 (FN)**

B.Tech II-Year II- Semester External Examination, August-2024 (Supplementary)

DESIGN AND ANALYSIS OF ALGORITHMS (CSE, IT, AIML and DS)

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

Note: *a) No additional answer sheets will be provided.*
b) All sub-parts of a question must be answered at one place only, otherwise it will not be valued.
c) Missing data can be assumed suitably.

Bloom's Cognitive Levels of Learning (BCLL)

Remember	L1	Apply	L3	Evaluate	L5
Understand	L2	Analyze	L4	Create	L6

Part - A Max.Marks:20

ANSWER ALL QUESTIONS

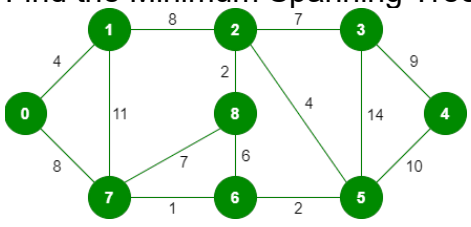
		BCLL	CO(s)	Marks
1	Define an algorithm? Write its properties?	L1	CO1	[2M]
2	Write the best- and worst-case time complexity of binary search?	L3	CO2	[2M]
3	What is feasible and optimal solutions?	L2	CO3	[2M]
4	List the applications of Dynamic programming?	L1	CO4	[2M]
5	Write the implicit rules for N-Queens Problem?	L2	CO5	[2M]
6	What is np class problem? Give example?	L1	CO6	[2M]
7	Define time complexity of an algorithm?	L1	CO1	[2M]
8	Write the differences between Dynamic programming and divide and conquer algorithm?	L3	CO3	[2M]
9	What is state space tree?	L1	CO5	[2M]
10	Define NP Hard Problem?	L1	CO6	[2M]

Part – B Max.Marks:50

ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 10 MARKS.

			BCLL	CO(s)	Marks
11.	a)	Write an algorithm for Matrix multiplication and find its time complexity?	L3	CO1	[5M]
	b)	Write Pseudo Code Convention for expressing an algorithm?	L2	CO1	[5M]
12.	a)	Derive the time complexity for the Merge sort?	L4	CO2	[5M]
	b)	Write the algorithm for Quick Sort?	L2	CO2	[5M]
13.	a)		L4	CO3	[5M]

Find the Minimum Spanning Tree using Kruskal and Prims Algorithm



	b)	Explain single source shortest path problem with an example?	L2	CO3	[5M]
14.	a)	There are 4 matrices with dimensions A1=1x2, A2=2x3, A3=3x4, A4=4x5. Find the matrix chain to compute the multiplication	L3	CO4	[5M]
	b)	Solve the following 0/1 Knapsack Problem using dynamic programming n=4, m=30, (w1,w2,w3,w4) = (10,15,6,9) and (p1, p2, p3, p4) = (2,5,8,1).	L3	CO4	[5M]
15.	a)	Solve the sum of subsets problem for the following data S={7,11,13,24} and M=31. Draw the state space tree also.	L3	CO5	[5M]

	b)	Explain n-queens problem with an algorithm?	L2	CO5	[5M]
16.	a)	Write the properties of P-Class and NP-Class?	L2	CO6	[5M]
	b)	Explain nondeterministic algorithm? Write an algorithm for 0/1 knapsack problem?	L2	CO6	[5M]
17.	a)	What is amortized analysis? What is the use of it?	L2	CO1	[4M]
	b)	What is Job Sequencing With Deadlines?	L2	CO2	[3M]
	c)	Write the general method of Greedy Method?	L2	CO3	[3M]
18.	a)	Explain Travelling Salesperson Problem? Give example	L2	CO4	[4M]
	b)	Write short notes on Graph coloring?	L2	CO5	[3M]
	c)	Write any 2 differences between NP hard and NP complete problems?	L3	CO6	[3M]

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