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(An Autonomous Institution)

Regulations: A15

Code No: 5FC04 **Date: 20-Aug-2024 (FN)**

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

DESIGN AND ANALYSIS OF ALGORITHMS (CSE and IT)

Time: 3 Hours **Max.Marks:75**

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:25

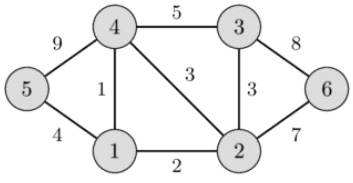
ANSWER ALL QUESTIONS

		BCLL	CO(s)	Marks
1	List the properties of an algorithm.	L1	CO1	[2M]
2	Which sorting technique do you recommend for sorting google search results. Why?	L5	CO2	[2M]
3	What is the control abstraction of Greedy Method?	L2	CO3	[2M]
4	Discuss about reliability design.	L2	CO4	[2M]
5	What is a graph coloring problem?	L2	CO5	[2M]
6	Write about halting problem.	L1	CO6	[3M]
7	Using step count find the time complexity of sum of 'n' natural numbers.	L3	CO1	[3M]
8	List any four applications of minimum cost spanning trees.	L1	CO3	[3M]
9	What are the implicit and explicit constraints in backtracking?	L2	CO5	[3M]
10	What are the advantages of Dynamic programming method?	L2	CO4	[3M]

Part – B Max.Marks:50

ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 10 MARKS.

			BCLL	CO(s)	Marks
11.	a)	Explain the role of instance characteristics in finding the time and space complexities with an example.	L4	CO1	[5M]
	b)	Compare Bigoh and Omega notation with examples.	L5	CO1	[5M]
12.	a)	Explain quick sort algorithm and simulate it for the following data 20, 38, 11, 17, 55, 31, 24	L4	CO2	[5M]
	b)	Discuss Iterative binary search algorithm.	L2	CO2	[5M]
13.	a)	Find the greedy solution for following job sequencing with deadlines problem n = 7, (p1,p2,p3,p4,p5,p6,p7) = (3,5,20,18,1,6,30), (d1,d2,d3,d4,d5,d6,d7) = (1,3,4,3,2,1,2)	L3	CO3	[5M]
	b)	Find the minimum spanning tree of the following graph using Prim's algorithm.	L3	CO3	[5M]



14.	a)	Describe the travelling salesman problem and discuss how to solve it using dynamic programming?	L6	CO4	[5M]
	b)	Write an algorithm for optimal binary search tree with an example.	L2	CO4	[5M]
15.	a)	Explain the Graph – coloring problem? Draw the state space tree for m= 3colors and n=4 vertices graph. Discuss the time and space complexity.	L6	CO5	[5M]
	b)	Write about Hamilton cycle problem. State the solution using Backtracking		CO5	[5M]
16.	a)	Explain the strategy to prove that a problem is NP-hard.	L2	CO6	[5M]
	b)	Explain how P and NP problems are related.	L2	CO6	[5M]
17.	a)	Write an algorithm for Binary search and analyze its time complexity.	L4	CO1	[4M]
	b)	State and Discuss the Single Source Shortest path problem? Give its applications?	L2	CO2	[3M]
	c)	Sort the following sequence of numbers using Merge sort 30, 20, 50, 70, 80, 10, 15, 25.	L5	CO3	[3M]
18.	a)	Explain reliability design problem with example.	L4	CO4	[4M]
	b)	State the principle of Backtracking.	L6	CO5	[3M]
	c)	Write non deterministic algorithm for sorting.	L3	CO6	[3M]

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