PRESIDENCY UNIVERSITY
BENGALURU

School Of Computer Science and Engineering & Information Science

End-Term Examinations, Aug 2024

Odd Semester: 2023 - 24

Course Code: CSE2007

Course Name: DESIGN AND ANALYSIS OF ALGORITHMS

Department: B.Tech

Date: 06-07-2024

Time: 9:30-12:30

Max Marks: 100

Weightage: 50%

Instructions:

(i)   Read the all questions carefully and answer accordingly.

(ii) Do not write any matter on the question paper other than roll number.

Q.No	Questions	Marks	CO	RBT
1	a. What is an Algorithm? Also write features of Algorithms.	4	CO1	L1
	b. List down basic efficiency classes? Also write down the order of growth for efficiency classes.	6	CO1	L2
	c. Briefly explain asymptotic notations.	10	CO1	L3

OR

Q.No	Questions	Marks	CO	RBT
2	a. Define Worst-case and Best-case efficiencies	4	CO1	L1
	b. List down the steps involved in mathematical analysis of Recursive Algorithms	6	CO1	L2
	c. Discuss the Analysis framework for finding analysis of algorithm efficiency.	10	CO1	L3

Q.No	Questions	Marks	CO	RBT
3	a. List down the steps for linear search and mention its best case, worst case and average case	4	CO2	L1
	b. Design algorithm to find Uniqueness of elements in an array (with an example)	6	CO2	L2
	c. Write selection sort algorithm and apply on following set of integers 64, 25, 12, 22, 11	10	CO2	L3

OR

| Q.No	Questions	Marks	CO	RBT
4	a. Discuss the General Method of Divide and Conquer	4	CO2	L1
	b. Design Bubble Sort Algorithm to sort the elements in an array (with an e.g.,). Compute the time complexity of the same	6	CO2	L2
	c. Briefly explain Traveling Salesman Problem (TSP) using brute force strategy with example	10	CO2	L3

5	a. Briefly explain Decrease & conquer strategy of programming	4	CO3	L1
	b. Briefly explain working of insertion sort algorithm with an example.	6	CO3	L2
	c. Write and explain binary search algorithm with an example	10	CO3	L3

<div align="center">OR</div>

6	a. List down the advantages and limitations of divide & conquer technique	4	CO3	L1
	b. Briefly explain decrease and conquer with two advantages and disadvantages	6	CO3	L2
	c. Write and explain quick sort algorithm with an example.	10	CO3	L3

7	a. Define Dynamic programming and briefly list down its properties	4	CO4	L1
	b. Briefly explain steps involved in Floyd's algorithm with steps involved in it.	6	CO4	L2
	c. Apply bellman ford algorithm for below graph	10	CO4	L3
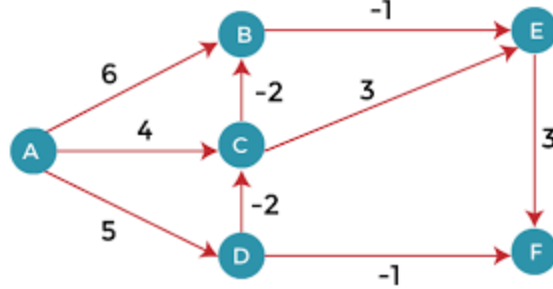
<div align="center">OR</div>

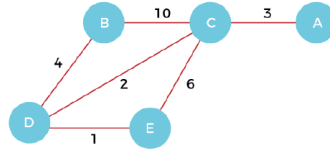|				
8	a. Compare and contrast between greedy method and dynamic programming method	4	CO4	L1
	b. Write an Algorithm for Single source shortest path using Dijkstra's	6	CO4	L2
	c. Apply all pair shortest path algorithm (Warshall's) for the below graph	10	CO4	L3
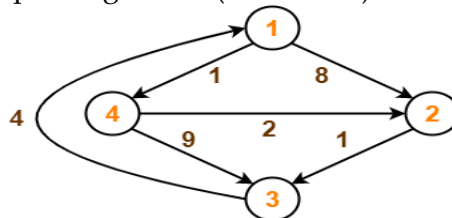
9	a. How does backtracking algorithm work?	4	CO5	L1
	b. How do I determine the constraints or conditions for backtracking? What happens if there is no valid solution in the search space?	6	CO5	L2
	c. Draw state space tree for N queens problem with 4 *4 chess board having 4 queens Q1,Q2,Q3,Q4	10	CO5	L3

<div align="center">OR</div>

10	a. List down the steps involved in branch bound technique	4	CO5	L1
	b. For a given set {3, 34, 4, 12, 5, 2} and the target sum = 9. Define a function and use recursive method to check whether there exists a subset with the given sum or not	6	CO5	L2

c. Find the minimum spanning tree (MST) by applying prims algorithm with B as source vertex.

10

CO5

L3