



Roll No

**PRESIDENCY UNIVERSITY
BENGALURU**

School Of Computer Science and Engineering & Information Science

Summer-Term Examinations, Aug 2024

Odd Semester: 2023 - 24

Course Code: CSE 2007

Course Name: Design and analysis of algorithms

Department: SOCSE

Date: 07.08.2024

Time: 01.00-04.00 PM

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. Describe Notion of Algorithm	4	CO1	L1
	b. List down the steps involved in mathematical analysis of Non-Recursive Algorithms	6	CO1	L2
	c. Identify the time complexity (upper bound) for the below iterative functions A() { Int i,j,k,n; for(i=1;i<=n;i++) { for(j=1;j<=i;j++) { for(k=1;k<=100;k++) { Printf("Ravi"); } } } }	10	CO1	L3

OR

2	a. List down the steps involved in analyzing an algorithm	4	CO1	L1
	b. Explain with an example how a new variable count introduced in a program can be used to find the number of steps needed by a program to	6	CO1	L2

	solve a problem instance.			
	c. Find the time complexity (upper bound) for the below recursive functions $T(n)=n + T(n-1); \quad ;n>1$ $T(n)=1 \quad ;n=1$	10	CO1	L3

3	a. In brief explain brute force strategy of programming	4	CO2	L1
	b. Briefly explain Traveling Salesman Problem (TSP) using brute force strategy with example	6	CO2	L2
	c. List down the steps for linear search and mention its best case, worst case and average case	10	CO2	L3

OR

4	a. Write an algorithm to find uniqueness of elements in an array	4	CO2	L1
	b. Demonstrate pattern matching algorithm with suitable example	6	CO2	L2
	c. List down the steps involved for bubble sort and apply the same to sort 9, 8,7, 6, 5, 4, 3, 2, 1	10	CO2	L3

5	a. In brief explain Divide & conquer strategy of programming	4	CO3	L1
	b. Explain the general divide & conquer recurrence relation	6	CO3	L2
	c. State master theorem and apply the same for recurrence relation $T(n) = 2T(n/2) + 1$	10	CO3	L3

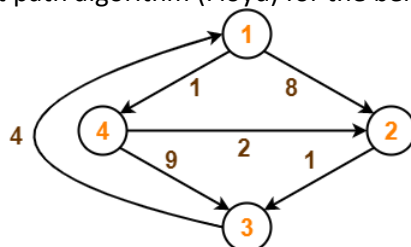
OR

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

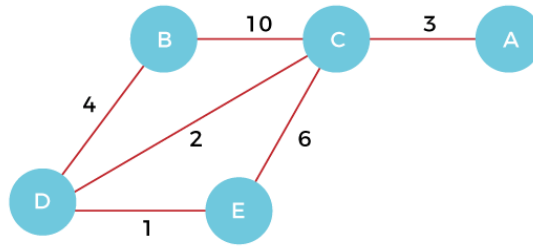
7	a. Define Dynamic programming and briefly list down its properties	4	CO4	L1
	b. Briefly explain steps involved in Floyd algorithm with steps involved in it.	6	CO4	L2
	c. Briefly explain Bellman ford algorithm and Why Relaxing Edges N-1 times, gives us Single Source Shortest Path?	10	CO4	L3

OR

8	a. Bring out at least three differences between divide & conquer and dynamic programming	4	CO4	L1
	b. List down the applications of the greedy strategy	6	CO4	L2
	d. Apply all pair shortest path algorithm (Floyd) for the below graph	10	CO4	L3



9	a. How does backtracking algorithm work?	4	CO1	L1
	b. Find the minimum spanning tree (MST) by applying prims algorithm with B as source vertex.	6	CO1	L2
	c. Draw state space tree for N queens problem with 4 *4 chess board having 4 queens Q1,Q2,Q3,Q4.	10	CO1	L3



OR

10	a. List down the steps involved in back tracking	4	CO2	L1
	b. Define minimum spanning tree (MST) and explain working principle of Prims algorithm.	6	CO2	L2
	c. How backtracking approach is used to solve sum of subset problem	10	CO2	L3