

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

SET B

**SCHOOL OF INFORMATION SCIENCE
END TERM EXAMINATION - JAN 2024**

Semester : Semester III - 2022
Course Code : CSA2005
Course Name : Analysis of Algorithms
Program : BCA

Date : 04-JAN-2024
Time : 1:00 PM - 4:00 PM
Max Marks : 100
Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

5 X 2M = 10M

1. Write an algorithm for linear search
(CO1) [Knowledge]
2. Consider the array $A = \{25, 9, 15, 30, 11, 17, 22\}$.
Apply bubble sort on A and find which element is present at index 2 after third pass
(CO2) [Knowledge]
3. What are Decision trees , write a simple decision tree for finding the biggest of 3 numbers.
(CO3) [Knowledge]
4. Write an algorithm for bubble sort and mention its efficiency?
(CO4) [Knowledge]
5. Define Divide and Conquere technique with an example.
(CO5) [Knowledge]

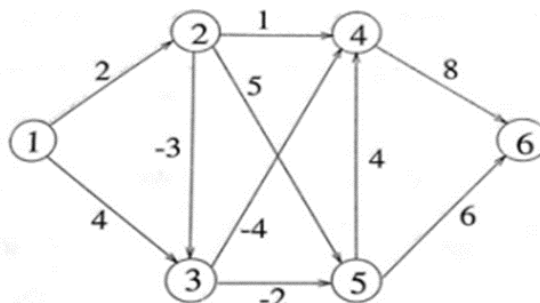
PART B

ANSWER ALL THE QUESTIONS

5 X 10M = 50M

6. Write an algorithm for bellman ford, Find the shortest path from node 1 to every other node in the given graph using Bellman-Ford algorithm

(CO1) [Comprehension]



7. Mr. Bharath gave test for the students. After evaluating the scripts, he wants store the marks of the students in increasing order. Help him to write corresponding algorithm which sorts based on the elements. Also do the analysis for the same.

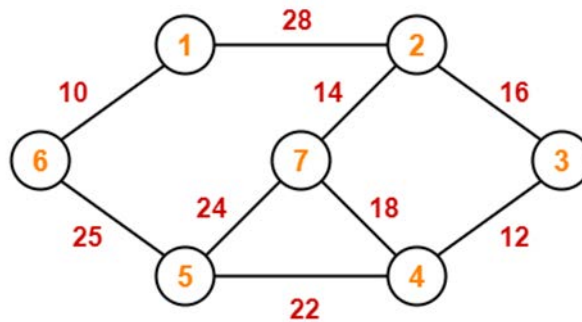
(CO2) [Comprehension]

8. Find the solution to the given fractional Knapsack problem.
Knapsack capacity $W=50$

item	weight	value
1	20	120
2	5	100
3	30	200
4	5	150

(CO3) [Comprehension]

9. Find the minimum cost spanning tree for the given graph using prim's algorithm.



(CO4) [Comprehension]

10. Explain the class of P and NP- Hard.

(CO5) [Comprehension]

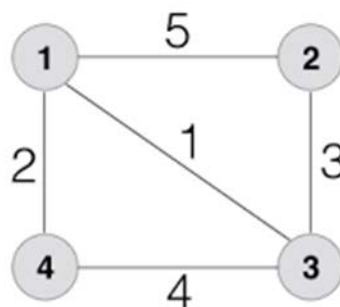
PART C

ANSWER ALL THE QUESTIONS

2 X 20M = 40M

11. Apply Floyd's algorithm to find all pair shortest path for the graph given below.

(CO4) [Application]



12. Write an algorithm to solve the N-Queens problem. Using State Space tree show working for $N=4$.

(CO5) [Application]