C

Reg. No. : | | | | | | | | | | |

Question Paper Code: 94203

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Fourth Semester

Computer science and Engineering

19UCS403- DESIGN AND ANALYSIS OF ALGORITHMS

(Regulations 2019)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (5x 1 = 5 Marks)

1. Which is not a method of specifying an algorithm? CO1- U

   (a) Flow chart (b) Algorithm (c) Program (d) Pseudocode

2. Which is the straight forward approach of solving the problem? CO1- U

   (a) Divide and Conquer (b) Decrease and Conquer

   (c) Brute force (d) Dynamic Programming

3. Greedy approach is applicable to only CO1- U

   (a) Sorting (b) Searching (c) Optimization Problem (d) String Problems

4. Problems that can be solved in polynomial time is called_____ CO1- U

   (a) Tractable problem (b) Intractable problem

   (c) Decision problems (d) Sorting problem

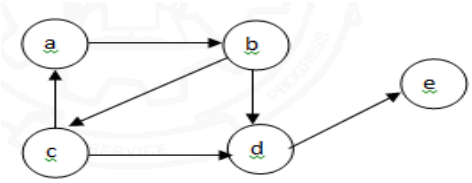
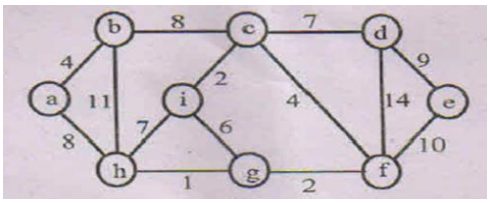
5. Both backtracking and Branch and bound is based on the construction of CO1-U

   (a) Decision Tree (b)State space Tree (c)Binary Search Tree (d) Red Black Tree

PART – B (5 x 3= 15Marks)

6. What are the steps to be followed in designing and Analyzing an Algorithm?. CO1- U
7. List out the advantages of Divide and Conquer algorithms. CO1- U
8. Define feasible and optimal solution CO1- U
9. Define NP hard problem CO1- U
10. What is lower bound? CO1- U

PART – C (5 x 16= 80Marks)

11.	(a)	Write short notes on algorithmic problem solving.	CO1-U	(16)
		Or		
	(b)	Explain in detail the steps involved in analysis of algorithm efficiency	CO1-U	(16)
12.	(a)	Write different algorithms to sort the given set of 12 elements 33,23,43,44,55,64,77 and 76 using Divide and Conquer Strategy (Hint: Quick sort, Merge sort). Provide a complete analysis of their efficiency.	CO2-App	(16)
		Or		
	(b)	Apply Warshall's algorithm to find the transitive closure of the digraph defined by the following Graph: 	CO2-App	(16)
13.	(a)	Apply the Kruskal's algorithm to find the shortest path for the given graph 	CO2-App	(16)
		Or		
	(b)	Write OBST algorithm to find optimal solution and solve the below problem and give the tree structure which has lowest expected cost.	CO2-App	(16)
14.	(a)	Explain the P, NP,NP-complete and NP Hard problems with proper justification using examples	CO1- U	(16)
		Or		
	(b)	Whether Hamiltonian Circuit problem is an NP hard Problem? Justify your answer with proper explanation	CO2- Ana	(16)
15.	(a)	Apply backtracking algorithm for 4-queens problem and draw the state space tree to find all the possible solution.	CO2- App	(16)
		Or		
	(b)	Explain how traveling salesman problem is solved by branch and bound method with example.	CO2- App	(16)

94203