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Question Paper Code: 94203

B.E./B.Tech. DEGREE EXAMINATION, MAY 2022

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)

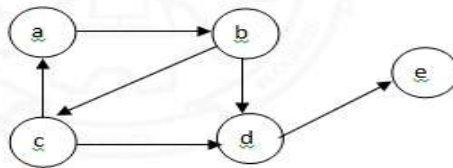
11. (a) Write short notes on algorithmic problem solving. CO1-U (16)
Or

- (b) Explain in detail the steps involved in analysis of algorithm efficiency CO1-U (16)

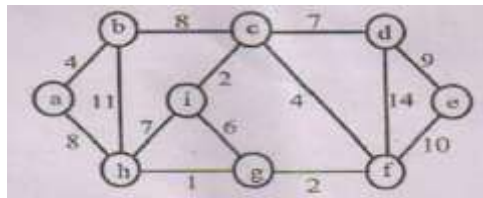
12. (a) Write different algorithms to sort the given set of 12 elements 33,23,43,44,55,64,77 and 76 using Divide and Conquer Strategy (Hint: Quick sort, Merge sort). Provide a complete analysis of their efficiency. CO2-App (16)

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)

