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

Question Paper Code: 1044455

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024
Fourth Semester
Computer Science and Engineering
U20CS402 - DESIGN AND ANALYSIS OF ALGORITHM
(Regulation 2020)

Time: Three Hours Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. What are the fundamental steps involved in algorithmic problem solving?

2. Define algorithm visualization.

3. List the strength and weakness of brute force algorithm.

4. What is the general divide-and-conquer recurrence relation?

5. Write the difference between the Greedy method and Dynamic programming.

6. How are the vertices not in the tree split into?

7. What is cut and min cut?

8. Differentiate augmentation and augmentation path?

9. Why the search path in a state-space tree of a branch and bound algorithm is terminated?

10. Give the formula used to find the upper bound for knapsack problem.

PART – B (5 x 16 = 80 Marks)

11. (a) Discuss important problem types that you face during Algorithm Analysis. (16)

(OR)

(b) List out the Steps in Mathematical Analysis of Recursive Algorithms and non recursive Algorithms. (16)

12. (a) Discuss Quick Sort Algorithm and Explain it with example. Derive Worst case and Average Case Complexity. (16)

(OR)

(b) Write algorithm to find closest pair of points using divide and conquer and explain it with example. Derive the worst case and average case time complexity. (16)

13. (a) Outline the Dynamic Programming approach to solve the Optimal Binary Search Tree problem and analyze it time complexity. (16)

(OR)

(b) Explain the following: (i) Kruskal's Algorithm (ii) Prim's Algorithm. (16)

14. (a) Explain in detail about Maximum Flow Problem? (16)

(OR)

(b) Outline the stable marriage problem with example. (16)

15. (a) Explain P, NP and NP complete problems. Outline the steps to find approximate solution to NP-Hard optimization problems using approximation algorithms with an example? (16)

(OR)

(b) Illustrate the approximation algorithm for the travelling salesman problem (TSP)? (16)

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