2019

DESIGN AND ANALYSIS OF ALGORITHMS

Paper : CS 503

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer **any five** *questions.*

1. Describe the following algorithm design techniques :   5×4=20

    (i)   Greedy Method

    (ii) Divide and Conquer

    (iii) Dynamic Programming

    (iv) Backtracking.

2. What is minimum-cost spanning tree ? Describe the following algorithms with the help of suitable examples : 2+9×2=20

(i) Prim's algorithm.

(ii) Kruskal's algorithm.

3. (a) Define Matrix Chain Multiplication Problem. Develop a solution to this problem using Dynamic Programming. 4+6=10

(b) Given a chain of four matrices A1, A2, A3 and A4, with $p0=5$, $p1=4$, $p2 = 6$, $p3 = 2$ and $p4 = 7$. Find m [1, 4]. 10

4. Demonstrate the solutions to 0/1 Knapsack problem using 10+10=20

(i) Greedy Algorithm

(ii) Dynamic Programming Algorithm with the help of suitable examples.

5. Describe backtracking solution to the

(i) 4–Queen's problem

(ii) Graph coloring problem. 10+10=20

6. (a) Define Branch and Bound algorithm. With the help of 8 puzzle problem, explain LC Branch and Bound strategy. 2+8=10

(b) Describe solution to the 'Job Sequencing problems with deadlines' using greedy method with the help of an example. 10

7. Write short notes on : 5×4=20

(i) NP-Hard and NP-Complete problems

(ii) Graph traversal

(iii) Master Theorem

(iv) Biconnected components.

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