

Roll No.
Printed Pages : 2

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BT-5/D-13

DESIGN AND ANALYSIS OF ALGORITHMS

Paper-CSE-301

Time allowed : 3 hours] [Maximum marks : 100

Note : Attempt five questions in all, selecting at least one question from each unit.

Unit-I

1. (a) Describe an algorithm for each of PUSH, POP, AddQ and DeleteQ. 10
- (b) What are Hash Tables ? Explain their applications with examples. 10

2. (a) What do you mean by a Binary Search Tree ? Write and explain algorithm for Deletion from a Binary Search Tree. 12

- (b) What are recurrences ? Explain any two methods to solve recurrences. 8

Unit-II

3. (a) Explain following with example : 5+5
 - (i) Dynamic Programming
 - (ii) Divide and Conquer
- (b) Describe Task Scheduling Problem in brief. 10

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(2)

4. Describe an algorithm for Longest Common Subsequence (LCS) problem and determine an LCS between following two given sequences X and Y.

X = {A, B, D, E, B, A, C}

Y = {B, A, B, E, D, B, C}

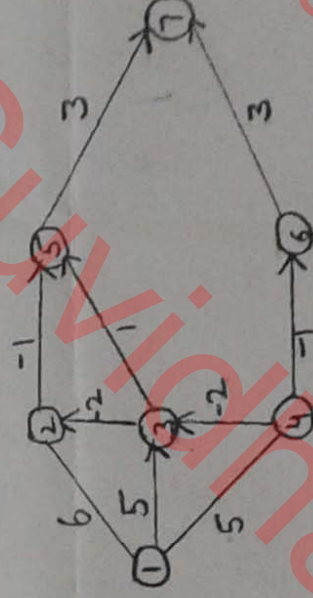
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Unit-III

5. Describe the system of Difference Constraints. Describe various steps involved in solving the Difference Constraints.

10+10

6. Discuss Bellman-Ford's Algorithm to solve Single-Pair Shortest Path Problem. Also Find the Shortest path in the given graph. 20



Unit-IV

7. (a) If a Comparison Network with n inputs sorts all 2^n possible sequences from the set $\{0, 1\}$ correctly, then prove that it sorts all sequences of arbitrary numbers correctly. 10
- (b) Differentiate Half Cleaner and Bitonic Sorter. 10
8. (a) Discuss the properties of Flow Networks with suitable examples. 10
- (b) State and Prove Maximum Flow-Minimum Cut Theorem. 10