Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER 2013

Subject Code: 181604 **Date: 09/05/2013**

Subject Name: Design and Analysis of Algorithm

Time: 10:30 am TO 01:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** What do you mean by performance analysis of an algorithm? Explain average case and worst case analysis with the help of suitable example **07**

(b) What is an Algorithm? What do you mean by linear inequalities and linear equation? Explain asymptotic notation with the help of example **07**

Q.2 **(a)** Explain how to apply the divide and conquer strategy for sorting the elements using merge sort **07**

(b) Differentiate the following: 1. Divide and conquer & Dynamic Programming **07**
2. Greedy Algorithm & Dynamic Programming

OR

(b) What do you mean by minimum spanning tree? Explain single source shortest path with the help of example. **07**

Q.3 **(a)** Solve the following Knapsack Problem using Greedy Algorithm The capacity of knapsack is 15 **07**

Items	1	2	3	4	5	6	7
Weight	2	3	5	7	1	4	1
Value	10	5	15	7	6	18	3

(b) Compute Longest common subsequence for the strings, **07**
A=<X,Y,Z,Y,T,X,Y>, B=<Y,T,Z,X,Y,X>

OR

Q.3 **(a)** Solve the following Knapsack Problem using Dynamic Programming Method Write the equation for solving the problem. The capacity of knapsack is 5 **07**

Items	1	2	3	4
Weight	2	3	4	5
Value	3	4	5	6

(b) Compute Matrix chain order for the following matrices, **07**
A1 (5 X 4) , A2 (4 X 6) , A3 (6 X 2), A4 (2 X 7)

Q.4 **(a)** Define Graph. Explain types of graph and different ways of graph representations **07**

(b) Give and explain Primôs Algorithm for Minimum Spanning Tree and Compare it with Kruskalôs algorithm with an example **07**

OR

Q.4 **(a)** What is an articulation point? Give applications of BFS and DFS. Generate at least 3 solutions for 5 ï queenôs problem **07**

(b) What is backtracking? Explain P, NP and NP complete problems **07**

Q.5 **(a)** What is the need of matching the string? Explain Finite automata for string matching. **07**

(b) Give the important properties of relation and also solve 8 ï queenôs problem for a feasible sequence (6, 4,7, 1) **07**

OR

Q.5 **(a)** Explain Rabin Karp method of string matching **07**

(b) What are the elementary operations? Explain Amortized Analysis **07**

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