

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 Prim's Algorithm for Minimum Spanning Tree and Compare it with Kruskal's 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 ñ queen's 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 ñ queen's 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**
