Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER 2013

Subject Code: 150703 Date: 21-05-2013

Subject Name: Design And Analysis Of Algorithms

Time: 10.30 am - 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)** Explain all asymptotic notations used in algorithm analysis. **06**

(b) Write the quick sort algorithm. Trace the same on data set - 4,3,1,9,8,2,4,7. **08**

Q.2 **(a)** Sort the letters of word ñEXAMPLEò in alphabetical order using insertion sort. **07**

(b) Explain Primôs algorithm with example for construction of MST. **07**

OR

(b) Explain Kruskalôs algorithm with example for construction of MST. **07**

Q.3 **(a)** Write the equation for finding out shortest path using Floydôs algorithm. Use Floydôs method to find shortest path for below mentions all pairs **07**

$$\begin{pmatrix} 0 & 3 & \infty & \infty \\ 2 & 0 & \infty & \infty \\ \infty & 7 & 0 & 1 \\ 6 & \infty & \infty & 0 \end{pmatrix}$$

(b) Given two sequences of characters, P=<MLNOM> Q=<MNOM> Obtain the longest common subsequence. **07**

OR

Q.3 **(a)** Given the four matrix find out optimal sequence for multiplication D=<5,4,6,2,7> **07**

(b) Given coins of denominations 2,4 and 5 with amount to be pay is 7. Find optimal no. of coins and sequence of coins used to pay given amount using dynamic method. **07**

Q.4 **(a)** Solve following knapsack problem using dynamic programming algorithm with given capacity W=5, Weight and Value are as follows : (2,12),(1,10),(3,20),(2,15). **07**

(b) Explain characteristics of greedy method with suitable example. **07**

OR

Q.4 **(a)** Explain how backtracking is used to solve four queen problem. Show the state space tree. **07**

(b) Write pseudo code for the basic depth first search algorithm. **07**

Q.5 **(a)** Differentiate BFS and DFS. **07**

(b) Explain finite automata for string matching. **07**

OR

Q.5 **(a)** What is the basic idea behind Rabin ï Karp algorithm? What is expected running time of this algorithm ? **07**

(b) Explain P and NP Problems. **07**