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 $\begin{pmatrix} 0 & Ð & 3 & Ð \\ 2 & 0 & Ð & Ð \\ Ð & 7 & 0 & 1 \\ 6 & Ð & Ð & 0 \end{pmatrix}$	**07**
	(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**