Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2014

Subject Code: 150703 **Date: 19-06-2014**

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)**	Why do we use asymptotic notations in the study of algorithms? Briefly describe the commonly used asymptotic notations.	**07**
	(b)	Explain Greedy method in detail with example and differentiate it with dynamic method.	**07**
Q.2	**(a)**	Sort the letters of word "DESIGN" in alphabetical order using bubble sort.	**07**
	(b)	Write algorithm to find Minimum Spanning Tree (MST) using Prim's method and compute its time complexity.	**07**
		OR	
	(b)	Define MST. Explain Kruskal's algorithm with example for construction of MST.	**07**
Q.3	**(a)**	Sort the following list using quick sort algorithm: **<50, 40, 20, 60, 80, 100, 45, 70, 105, 30, 90, 75>** Also discuss worst and best case of quick sort algorithm.	**07**
	(b)	Given two sequences of characters, P=<ABCDABE>, Q=<CABE > Obtain the longest common subsequence.	**07**
		OR	
Q.3	**(a)**	Given the four matrix find out optimal sequence for multiplication D=<15,5,10,20,25>	**07**
	(b)	Given coins of denominations 1,3 and 4 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)**	Write a brief note on NP-completeness and the classes-P, NP and NPC.	**07**
	(b)	Explain the heap sort in detail. Give its complexity.	**07**
		OR	
Q.4	**(a)**	Explain Backtracking Method. What is N-Queens Problem? Give solution of 4-Queens Problem using Backtracking Method.	**07**
	(b)	Explain finite automata algorithm for string matching.	**07**
Q.5	**(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 Rabin-Karp Algorithm for string matching and give it complexity.	**07**
		OR	
Q.5	**(a)**	Explain Selection Sort Algorithm and give its best case, worst case and average case complexity.	**07**
	(b)	Show how divide and conquer technique is used to compute product of two n digit no with example.	**07**

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