Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V EXAMINATION – WINTER 2015

Subject Code: 150703 Date:08/12/2015

Subject Name: Design and Analysis of Algorithms

Time: 10:30am to 1:00pm 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)**	Answer the following. (i)Explain why analysis of algorithms is important? Explain: Worst Case, Best Case & Average Case Complexity. (ii) Define: Optimal Solution, Feasible solution, Principle of Optimality.	**07**
	(b)	What is Divide and Conquer Technique? Give the use of it for Binary Searching Method. Also give its Time Complexity.	**07**
Q.2	**(a)**	Give the properties of Heap Tree. Sort the following data using Heap Sort Method: 20, 50, 30, 75, 90, 60, 80, 25, 10, 40.	**07**
	(b)	Define Minimum Spanning Tree(MST). Explain Krushkal's Algorithm to find MST with example.	**07**
		OR	
	(b)	Explain Prim's Algorithm to find Minimum Spanning Tree with example. What is its Time Compexity?	**07**
Q.3	**(a)**	Solve Making Change problem using Dynamic Programming. (denominations: d1=1,d2=4,d3=6). Give your answer for making change of Rs. 8.	**07**
	(b)	Find Longest Common Subsequence using Dynamic Programming Technique with illustration X={A,B,C,B,D,A,B} Y={B,D,C,A,B,A}	**07**
		OR	
Q.3	**(a)**	Explain the characteristics of Greedy algorithms. Compare Greedy algorithms with Dynamic Programming Method giving example of Knapsack Problem.	**07**
	(b)	Explain Chained Matrix Multiplication with example.	**07**
Q.4	**(a)**	Explain Backtracking Method. What is N-Queens Problem? Give solution of 4-Queens Problem using Backtracking Method.	**07**
	(b)	Explain: Acyclic Directed Graph, Articulation Point, Dense Graph, Breadth First Search Traversal, Depth First Search Traversal.	**07**
		OR	
Q.4	**(a)**	Write a program/algorithm of Merge Sort Method. What is Complexity of it?	**07**
	(b)	Explain use of Branch & Bound Technique for solving Assignment Problem.	**07**
Q.5	**(a)**	What is Finite Automata? Explain use of finite automata for string matching with suitable example.	**07**
	(b)	Explain in Breif: P Problem, NP Problem, NP Hard Problem, NP Complete Problem.	**07**
		OR	
Q.5	**(a)**	Explain Rabin- Carp method for string matching and also give the algorithm.	**07**

(b) Explain in Breif: **07**
Travelling Salesman Problem, Recurrence Equations, Relation, Approximation Algorithms.

****