Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 150703 **Date: 01/05/2017**

Subject Name: Design and Analysis of Algorithms

Time: 02:30 PM to 05:00 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)**	Define an amortized analysis with any one of its techniques.	**07**
	(b)	Explain in brief characteristics of greedy algorithms. Compare Greedy Method with Dynamic Programming Method.	**07**
Q.2	**(a)**	Explain Selection Sort Algorithm and give its best case, worst case and average case complexity with suitable example	**07**
	(b)	Write a brief note on NP-completeness and the classes-P, NP and NPC.	**07**
		OR	
	(b)	Explain Backtracking Method. What is N-Queens Problem? Give solution of 4- Queens Problem using Backtracking Method.	**07**
Q.3	**(a)**	What is Divide and Conquer Technique? Give the use of it for Binary Searching Method. Also give its Time Complexity	**07**
	(b)	Define Minimum Spanning Tree(MST). Explain Krushkal's Algorithm to find MST with example.	**07**
		OR	
Q.3	**(a)**	Explain Chained Matrix Multiplication with example.	**07**
	(b)	Explain: Acyclic Directed Graph, Articulation Point, Dense Graph, Breadth First Search Traversal, Depth First Search Traversal.	**07**
Q.4	**(a)**	Write a program/algorithm of Merge Sort Method. What is Complexity of it?	**07**
	(b)	What is Finite Automata? Explain use of finite automata for string matching with suitable example.	**07**
		OR	
Q.4	**(a)**	Explain Rabin- Carp method for string matching and also give the algorithm.	**07**
	(b)	Explain use of Branch & Bound Technique for solving Assignment Problem.	**07**
Q.5	**(a)**	Explain Bubble sort algorithm. Derive the algorithmic complexity in Best case, worst case and Average case analysis.	**07**
	(b)	Why do we use asymptotic notations in the study of algorithms? Briefly describe the commonly used asymptotic notations.	**07**
		OR	
Q.5	**(a)**	Write algorithm to find Minimum Spanning Tree (MST) using Prim's method and compute its time complexity.	**07**
	(b)	Explain the heap sort in detail. Give its complexity.	**07**

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