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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) - EXAMINATION – SUMMER 2016

Subject Code:2150703 **Date:21/05/2016**

Subject Name:Analysis and Design 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)**	Why do we use asymptotic notations in the study of algorithms? Briefly describe the commonly used asymptotic notations.	**07**
	(b)	Define MST. Explain Kruskal's algorithm with example for construction of MST.	**07**
Q.2	**(a)**	Explain finite automata for string matching with example.	**07**
	(b)	Write a brief note on NP-completeness and the classes-P, NP and NPC.	**07**
		OR	
	(b)	What is the basic idea behind Rabin – Karp algorithm? What is expected running time of this algorithm ? Explain it with example.	**07**
Q.3	**(a)**	Explain in brief characteristics of greedy algorithms. Compare Greedy Method with Dynamic Programming Method.	**07**
	(b)	Explain the use of Divide and Conquer Technique for Binary Search Method.What is the complexity of Binary Search Method? Explain it with example.	**07**
		OR	
Q.3	**(a)**	Explain Breadth First Traversal Method for Graph with algorithm.	**07**
	(b)	Explain Depth First Traversal Method for Graph with algorithm.	**07**
Q.4	**(a)**	What is an amortized analysis? Explain aggregate method of amortized analysis using suitable example.	**07**
	(b)	Discuss Assembly Line Scheduling problem using dynamic programming with example.	**07**
		OR	
Q.4	**(a)**	Write a program/algorithm of Quick Sort Method and analyze it with example.	**07**
	(b)	Explain Backtracking Method. What is N-Queens Problem? Give solution of 4 Queens Problem using Backtracking Method.	**07**
Q.5	**(a)**	Explain Chained Matrix Multiplication with example.	**07**
	(b)	Explain Selection Sort Algorithm and give its best case, worst case and average case complexity with example.	**07**
		OR	
Q.5	**(a)**	Discuss matrix multiplication problem using divide and conquer technique.	**07**
	(b)	Sort the letters of word "EDUCATION" in alphabetical order using insertion sort.	**07**

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