Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII EXAMINATION – SUMMER 2016

Subject Code:181604 **Date:16/05/2016**

Subject Name:Design and Analysis of Algorithm (Department Elective - II)

Time:10:30 AM to 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)**	What are the general characteristics of Greedy Algorithms? Also compare Greedy Algorithms with Dynamic Programming and Divide and Conquer methods.	**07**
	(b)	Define: (1) Algorithm (2) Average case (3) Time complexity (4) Space complexity (5) Set (6) Function (7) Relation	**07**
Q.2	**(a)**	Explain the accounting method of amortized analysis using stack operations.	**07**
	(b)	Explain potential method of amortized analysis.	**07**
		OR	
	(b)	Explain how to apply the divide and conquer strategy for sorting the elements using merge sort.	**07**
Q.3	**(a)**	What do you mean by minimum spanning tree? Explain single source shortest path with the help of example.	**07**
	(b)	Define : (1) P (2) NP (3) NP-complete (4) NP-hard.	**07**
		OR	
Q.3	**(a)**	Give the algorithm for Depth First Search of a Graph. Also define “Articulation Point” of the graph and explain how to find it.	**07**
	(b)	Give the algorithm with example to solve 0/1 Knapsack Problem using Dynamic Programming	**07**
Q.4	**(a)**	Give the algorithm to find the best way to multiply n matrices. Analyze the algorithm and give the timing analysis.	**07**
	(b)	Explain breadth first search algorithm with example.	**07**
		OR	
Q.4	**(a)**	Define Graph. Explain types of graph and different ways of graph representations.	**07**
	(b)	Explain assembly line scheduling with example by dynamic programming.	**07**
Q.5	**(a)**	Exaplain Quick sort algorithm with example & Analyze it.	**07**
	(b)	Exaplain Insertion sort algorithm with example & Analyze it.	**07**
		OR	
Q.5	**(a)**	Write an algorithm to find binomial coefficients using recursion. Analyze it.	**07**
	(b)	Give and explain Kruskal’s Algorithm for Minimum Spanning Tree and Compare it with Prim’s algorithm with an example.	**07**

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