GUJARAT TECHNOLOGICAL UNIVERSITY ME – SEMESTER I (OLD) – • EXAMINATION – SUMMER 2016

Subject Code: 710201N Dat			e:16/05/2016 al Marks: 70	
Subject Name: Computer Algorithm Time:02:30 pm to 05:00 pm Total Marl Instructions:				
	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.		
Q.1	(a) (b)	Define the following terms briefly 1) Greedy choice property 2) Optimal substructure property Give properties of red black trees and explain its rotations with example	07 07	
Q.2	(b) (a)	Explain following operations on Fibonacci heap i) Insertion of a node ii) Union of two Fibonacci heaps	07 07	
	(b)	Explain how i th smallest element can be obtained using quick sort partitioning process. OR	07	
	(b)	Analyze the running time of DFS algorithm if graph is represented by adjancy matrix instead of adjancy list.	07	
Q.3	(a)	Write down worst case linear time algorithm to solve insertion problem. Determine recurrence relation to obtain its running time complexity.	07	
	(b)	Write down bucket sort algorithm. Derive its time complexity. OR	07	
Q.3	(a)	Explain the terms weighted union, union by rank and path compression heuristic in detail.	07	
	(b)	Use branch and bound to solve the assignment problem with the following cost matrix	07	
Q.4	(a)	Explain Prim's algorithm in detail. Give difference between Prim's algorithm with Kruskal's algorithm	07	
	(b)	Explain Heapsort in detail.	07	
Q.4	(a)	Define precisely Set Cover and Vertex Cover problems and also discuss P, NP, NP complete problems.	07	
	(b)	Explain Rabin Carp string matching algorithm in detail.	07	
Q.5	(a)	What is an amortized analysis? Explain counting method of amortized analysis using suitable example.	07	
	(b)	What is binomial heap? Explain union operation on two binomial heaps.	07	
Q.5	(a)	Explain Matrix chain multiplication using dynamic programming. Consider no. of matrices = 5 with any dimensions suitable with it.	07	
	(b)	Write a short note on approximation algorithms.	07	
