Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– V(OLD) EXAMINATION – SUMMER 2019

Subject Code:150703 Date:31/05/2019

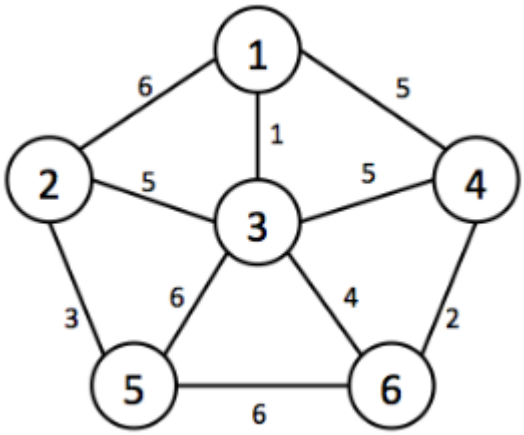
Subject Name:Design And Analysis Of Algorithms

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 Algorithm. Discuss factors affecting time complexity of an algorithm.	**07**
	(b)	Explain Big Oh (O), Omega (Ω) and Theta (θ) asymptotic notations.	**07**
Q.2	**(a)**	Apply merge sort algorithm on array A = {2,7,3,5,1,9,4,8}. What is time complexity of merge sort in worst case?	**07**
	(b)	Define Minimum Spanning Tree. Use Krushkal's algorithm to find Minimum Spanning Tree of given graph	**07**



OR

	(b)	Discuss any two methods of amortized analysis in detail	**07**
Q.3	**(a)**	Write greedy algorithm for job scheduling problem. Derive its time complexity.	**07**
	(b)	Write divide and conquer algorithm to solve Exponential problem. Also solve 2^9 using same algorithm.	**07**

OR

Q.3	**(a)**	Obtain longest common subsequence using dynamic programming. Given A = "acabaca" and B = "bacac"	**07**
	(b)	Explain Depth First Search algorithm for a graph with example. Also explain Tree Edges, Back Edges and Cross Edges	**07**
Q.4	**(a)**	Solve making change problem using dynamic programming Given amount N=8, and denominations d = {1, 3, 5, 6}	**07**
	(b)	What is backtracking? How 4-Queen problem is solved using backtracking?	**07**

OR

Q.4	**(a)**	Sort given array A = {27, 46, 11, 95, 67, 32, 78} using insertion sort algorithm. Also perform best case and worst case analysis of insertion sort algorithm.	**07**
	(b)	How Rabin Karp algorithm performs string matching? Explain with example.	**07**
Q.5	**(a)**	Explain P Problem, NP Problem and NP Complete Problem.	**07**
	(b)	Write Naïve sting matching algorithm. Find its time complexity and perform sting matching for given pattern P = "ACD" Text T = "CACDACAACDAC"	**07**

OR

Q.5	**(a)**	Explain in brief: Articulation Point, Directed Acyclic Graph, Recurrence Relations	**07**
	(b)	Explain how to solve knapsack problem using greedy algorithms	**07**

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