Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2018

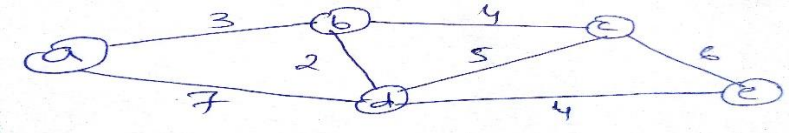
Subject Code:2150703 Date:27/11/2018

Subject Name:Analysis and Design of Algorithms

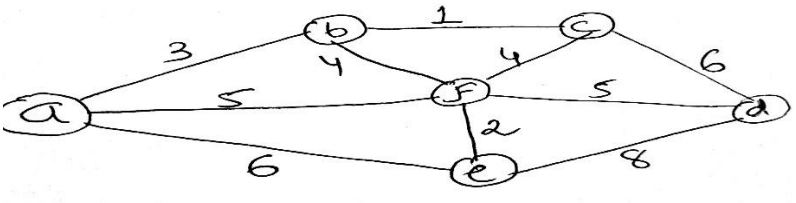
Time: 10:30 AM TO 01:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Define Algorithm, Time Complexity and Space Complexity.	**03**
	(b)	Differentiate branch and bound and back tracking algorithm.	**04**
	(c)	Analyze Selection sort algorithm in best case and worst case.	**07**
Q.2	**(a)**	Solve the recurrence $T(n) = 7T(n/2) + n^3$	**03**
	(b)	Explain: Articulation Point, Graph, Tree	**04**
	(c)	Write Merge sort algorithm and compute its worst case and best-case time complexity. Sort the List G,U,J,A,R,A,T in alphabetical order using merge sort.	**07**
		OR	
	(c)	Consider Knapsack capacity W=9, w = (3,4,5,7) and v=(12,40,25,42) find the maximum profit using dynamic method.	**07**
Q.3	**(a)**	Differentiate the Greedy And Dynamic Algorithm.	**03**
	(b)	Demonstrate Binary Search method to search Key = 14, form the array A=<2,4,7,8,10,13,14,60> .	**04**
	(c)	Solve Making change problem using dynamic technique. d1 = 1, d2=2, d3=4, d4=6, Calculate for making change of Rs. 10.	**07**
		OR	
Q.3	**(a)**	Find out the NCR $\binom{5}{3}$ Using Dynamic Method.	**03**
	(b)	Find single source shortest path using Dijkstra's algorithm form a to e. 	**04**
	(c)	For the following chain of matrices find the order of parenthesization for the optimal chain multiplication (13,5,89,3,34).	**07**
Q.4	**(a)**	Explain Tower of Hanoi Problem, Derive its recursion equation and computer it's time complexity.	**03**
	(b)	Explain finite automata algorithm for string matching.	**04**
	(c)	Find out LCS of A={K,A,N,D,L,A,P} and B = {A,N,D,L}	**07**
		OR	
Q.4	**(a)**	Explain Principle of Optimality with example.	**03**
	(b)	Define BFS. How it is differ from DFS.	**04**
	(c)	Solve the following instance of knapsack problem using Backtracking Technique. The Capacity of the Knapsack W = 8 and w = (2,3,4,5) and value v = (3,5,6,10)	**07**
Q.5	**(a)**	Draw the state space tree Diagram for 4 Queen problem.	**03**
	(b)	Define P, NP, NP-Hard and NP-Complete Problem.	**04**

(c) Find out the Minimum Spanning Tree using Kruskal Algorithm for given Graph. **07**

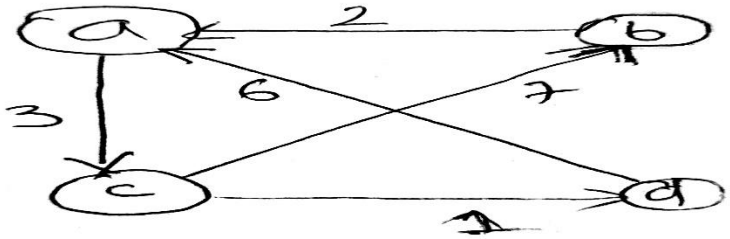


OR

Q.5 **(a)** Explain naïve string matching algorithm with example. **03**

(b) Explain DFS algorithm in brief. **04**

(c) Find all pair of shortest path using Floyd's Algorithm for given graph **07**



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