

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:2150703

Date:27/11/2018

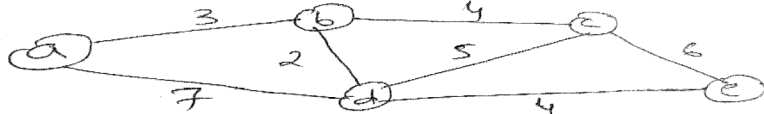
Subject Name:Analysis and Design of Algorithms

Time: 10:30 AM TO 01:00 PM

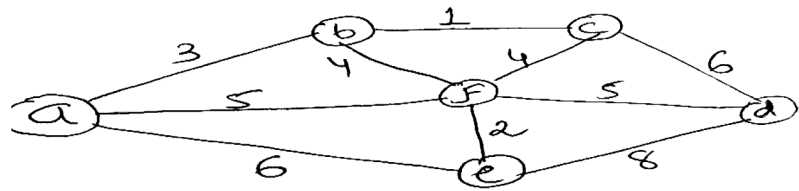
Total Marks: 70

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

