Seat No.	

SL-470

Total No. of Pages : 2

T.E. (Computer Science & Engineering) (Part-III) (Semester-V) (Revised) Examination, May - 2017

COMPUTER ALGORITHM

Sub. Code : 66296

Day and Date : Thursday, 18-05-2017
Time : 10.00 a.m. to 1.00 p.m.

Total Marks : 100

Instructions :
1) **Questions 4 and 8 are compulsory.**
2) **Attempt any four questions from remaining questions.**
3) **Figures to the right indicate full marks.**
4) **Assume suitable data wherever necessary.**

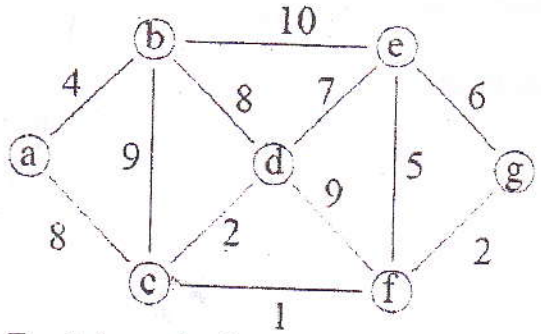
Q1) a) Explain space and time complexity with suitable example. **[8]**

b) Find an Optimal Solution to the Knapsack instance, n=4, m=30, profit (p1, p2, p3, p4) = (27,20,24,15) and weights (w1, w2, w3, w4) = (15, 10, 18, 10). **[8]**

Q2) a) Explain Merge Sort Algorithm with example. Show that its complexity is O(n log n). **[8]**

b) Let n=4 and probabilities with which identifiers (a1, a2, a3, a4) = (do, if, int, while) are searched are - p(1:4) = (4, 4, 2, 2) and probabilities of unsuccessful searches are q(0:4) = (3, 4, 1, 1, 1). Design optimal binary search tree using dynamic programming. **[8]**

Q3) a) Apply Prim's and Kruskal's Algorithm to find minimum Spanning Tree for following graph. **[8]**



Connected graph

b) Explain solution to all pair shortest path problem using dynamic programming. **[8]**

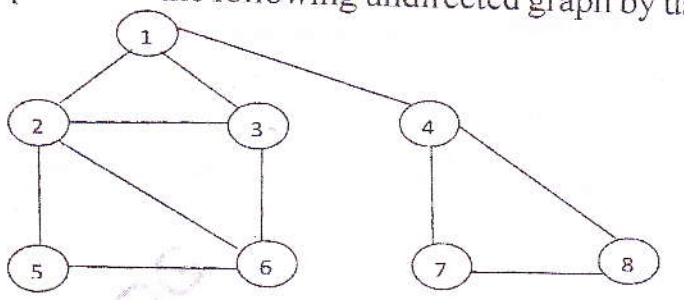
P.T.O.

Q4) Write short note on (Solve any three): **[18]**

a) Randomized Algorithm
b) Binary Search Algorithm
c) Huffman Code
d) 0/1 Knapsack Problem

Q5) a) Show that CNF satisfiability is reducible to directed Hamiltonian cycle. **[8]**
b) What are connected components and spanning trees? How is BFS algoritm used to find whether graph is connected or not. **[8]**

Q6) a) Explain solution to Graph Coloring problem using backtracking. **[8]**
b) Explain how to find Articulation point using DFS. Identify articulation points for the following undirected graph by using DFS spanning tree. **[8]**



Q7) a) Explain backtracking solution to n-Queens problem. **[8]**
b) Describe and give example of prefix computational model with PRAM. **[8]**

Q8) Write short note on: **[18]**

a) Define the following terms:

i) Deterministic and non-deterministic algorithms

ii) Decision and Optimization Problems

iii) P and NP Problems

b) Butterfly Network

c) MESH Computational Model.

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