Seat No. 31793

T.E. (CSE) (Semester - V) (New) Examination, June - 2014
COMPUTER ALGORITHMS
Sub. Code : 45604

Day and Date : Monday, 09 - 06 - 2014   Total Marks : 100
Time :2.30 p.m. to 5.30 p.m.

Instructions :   1)   Attempt any three questions from each section.
                   2)   Figures to the right indicate full marks.

SECTION - I

**Q1)** a)   Explain different asymptotic notations.   [8]

b)   Write algorithm to select n^{th} smallest element in list. Compute its complexity.   [8]

Q2) a)   Obtain a set of optimal Huffman codes for the messages $(M_1,...,M_7)$ with relative frequencies $(q_1,...,q_7)=(4, 5, 7, 8, 10, 12, 20)$. Draw the decode tree for this set of codes.   [8]

b)   Explain all pair shortest path algorithm with example.   [8]

Q3) a)   Find an optimal merge pattern for ten files whose lengths are 28, 32, 12, 5, 84, 53, 91, 35, 3 and 11.   [8]

b)   Solve the following instance of reliability design problem with 3 stages. Cost of the system is 105. Cost of device in stage 1 is 30, stage 2 is 15 and stage 3 is 20. Reliabilities for 3 stages are 0.9, 0.8 and 0.5 respectively.   [8]

Q4) Write note on: [18]

a)   Combination of merge-insertion sort.

b)   Minimum Cost Spanning Tree.

c)   Flow shop scheduling.

SECTION -II

Q5) a) Define articulation point and Bi-connected component with suitable example. Identify articulation points using DFS spanning tree in following graph. **[8]**
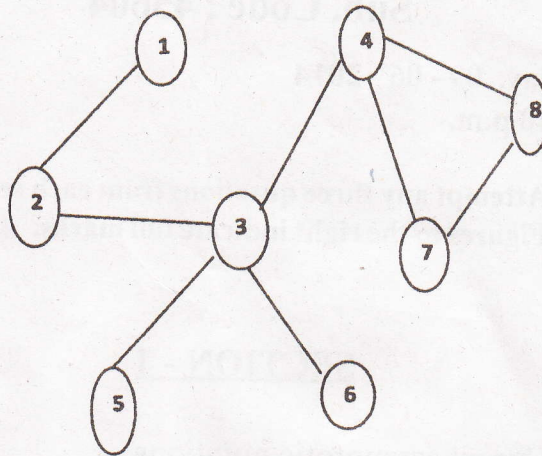
b) Explain the searching techniques for graphs. DFS BFS **[8]**

Q6) a) Draw and explain permutation-tree generated for 8-Queens problem using backtracking. **[8]**

b) What is backtracking? Explain sum of subsets problem with suitable example. **[8]**

Q7) a) Explain the relationship between P, NP, NP-Complete and NP-Hard problems with neat diagram. **[8]**

b) Explain Monte Carlo algorithm for testing polynomial equality and primality testing. **[8]**

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

a) Graph Coloring.

b) Probabilistic algorithm.

c) Chromatic number decision problem.

ƐƐƐ