FACULTY OF INFORMATICS

M.C.A.   II - Year   I – Semester (Main) Examination, January 2015

Subject : Design and Analysis of Algorithms

Time : 3 hours   Max. Marks : 80

Note: Answer ONE question from each unit. All questions carry equal marks.

UNIT – I

1 a) Write a short note on Randomized algorithms.   8
   b) Write an algorithm for finding maximum element of an array. Perform best and
   average case complexity with appropriate notations.   8

OR

2 a) Write an algorithm to delete an element into a circular queue.   8
   b) Briefly explain about adjacency matrices and lists.   8

UNIT – II

3 a) Write an algorithm to compute convex hull of the n input points which makes use of
       stack. What is its time complexity?   8
   b) Write binary search algorithm and explain it with an example.   8

OR

4 a) Write Prim's algorithm for finding minimum spanning tree and analyse.   10
   b) Find the minimum spanning tree of the following graph using Prim's algorithm.   6
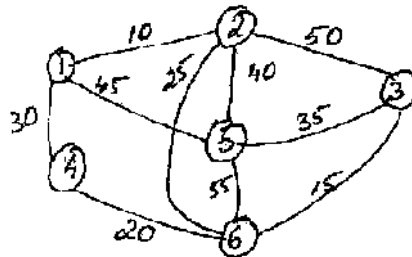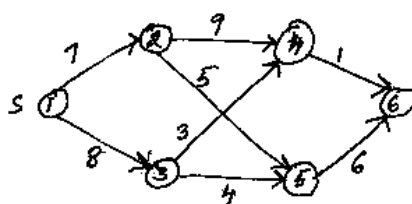

UNIT – III

5 Design an algorithm using dynamic programming to solve knapsack problem.   16

OR

6 Find a minimum cost from S to T in the multistage graph of below figure.   16

UNIT – IV

7 Explain 8 queens problem using back tracking along with its state space tree. Develop
   an algorithm for the same.   16

OR

8 Explain branch and bound technique to solve knapsack problem. Use it to solve the
   following instance of the knapsack problem n = 5 ;   16
   P = {10, 15, 6, 8, 4}   W = {4, 6, 3, 4, 2}, m = 12

UNIT-V

9 a) Discuss in detail NP complete problem with examples.   8
   b) Give the cliques decision problem.   8

OR

10 a) Describe about job shop scheduling.   8
   b) Discuss the features of node cover decision problem.   8

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