M.Tech 3rd Semester Examination
Jan. 2014
Subject – Algorithms Design & Techniques
Subject Code – CSL-603

Before answering the question paper the candidate should ensure that they have been supplied the correct question paper. Complaints in this regard, if any, shall not be entertained after the examination.

Note: Question No. 1 is Compulsory and attempt two questions from each section. All questions carry equal marks.

1. [2 x 10 = 20]
   a) Discuss basic characteristics of an algorithm.
   b) Explain concept of recursion for solving problems.
   c) Explain masters theorem.
   d) Discuss importance of asymptotic notations.
   e) Define Hamiltonian Cycle.
   f) Define Reducibility.
   g) Describe sequence of steps used in design and analysis of an algorithm.
   h) State clique problem.
   i) Explain practical applicability of graph colouring problem.
   j) Define minimum spanning tree

SECTION - A

2(a) Give the best case, average case and worst case analysis of quick sort. [10]

(b) Write an algorithm for creating a binary search tree by taking the following elements (65, 43, 15, 78, 34, 83, 100, 12) [10]

SECTION - B

3(a) Explain the divide and conquer approach for analyzing an algorithm. [10]

(b) Discuss and explain Strassen’s Matrix multiplication algorithm. [10]

4(a) Find the MST of the given graph using Kruskal’s method. [10]

(b) Explain The algorithm of job sequencing with deadlines by taking suitable example. [10]

5(a) Write steps to solve 0/1 knapsack problem using dynamic programming. Take suitable example. [10]

(b) Define optimal binary search tree. Write steps to construct an optimal binary search tree. [10]

6(a) Define backtracking. Solve 8-queens problem using backtracking. [10]

(b) State and explain general Least Count search method. [10]

7(a) Describe the strategy that is used to show that the given problem is an NP-Hard problem. [10]

(b) Explain the vertex cover problem. [10]