Name: _____ Roll no.: _____

BTech (CS/IT): Semester II
Data Structure (CS102)
End-Semester Exam (Marks: 20) Time: 60 Minutes

Instructions: Answers should be written to the point using dark pen (black pen preferred). You may divide the page into multiple columns, if needed.

Questions

Q1. Insert the following sequence of elements (one-by-one) into an empty R-B Tree: < 30, 20, 10, 15, 25, 23, 40, 35, 42, 1 >. Then delete the following elements from the tree: < 23, 15, 1 > . Demonstrate each step pictorially after each insertion or deletion operation. (5)

Q2. The level-order traversal of a complete binary tree is: A, B, C, D, E, F, G, H, I. Illustrate how it can be converted into a Max-Heap. (4)

Q3. Sort the following sequence of elements using Insertion Sort. Show outcome of each iteration.

< 30, 20, 40, 15, 25, 23, 10, 35, 42, 45 >.

Q4. What is Spanning Tree? Name two algorithms for finding a minimum cost spanning tree and compare them. Explain origin-based algorithm with an example considering a graph of at least 10 nodes and 15 edges. (5)

----- Good Luck -----