Institute of Engineering and Management
Department of Information Technology
B.Tech. IT
Puja Assignment 2018
Data Structures and Algorithms (CS 302)

1. What are the differences between a general tree and a binary tree?
2. Prove that the height h of a binary tree T is $h=\log_2 (n+1)$.
3. Write an algorithm to insert an element in the middle of a linked list.
4. Construct a binary tree from the following traversals:
   Inorder: D B F E A G C L J H K
   Postorder: D F E B G L J K H C A
5. Find the postfix notation of
   (a + b * x) / (a – d) s – c ^ y (show all steps) using stack.
6. Difference between external and internal sorting algorithm with example?
7. Write the appropriate C code that performs bubble sort. Also calculate the worst case complexity of bubble sort?
8. The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the final resultant hash table? Show insertion of each element in hash table step by step.
9. Define some general properties and application of Spanning Tree.
10. Find minimum Spanning-Tree by using both Kruskal's and Prim's algorithm of the below graph: