**ABES ENGINNERING COLLEGE, GHAZIABAD**

**DEPARTMENT OF CSE-DS**

**B.TECH SEM III**

**DATA STRUCTURE(KCS 301)**

**QUESTION BANK: UNIT -5**

**TOPIC: TREE**

1. Define extended binary tree, full binary tree, strictly binary tree and complete binary tree.
2. Number of nodes in a complete tree is 100000. Find its depth.
3. Write advantages of AVL tree over Binary Search Tree (BST).
4. Draw the binary search tree that results from inserting the following numbers in the sequence starting with 11:

11,47,81,9,61,10,12

1. Draw a binary tree for the expression:

A \* B – (C + D ) \* ( P /Q)

1. Discuss the concept of "successor" and “predecessor” in Binary Search Tree.
2. Convert the following arithmetic infix expression into its equivalent postfix  
   expression.  
   Expression: A-B/C+D\*E+F
3. Explain threaded binary tree. What is importance of threaded binary tree? Explain the advantages of using a threaded binary tree. Write an algorithm to insert a node in threaded binary tree.
4. Explain height balanced tree. List general cases to maintain the height.
5. What is height balanced tree? Why height balancing of Tree is required? Create an AVL Tree for the following elements: a,z,b,y,c,x,d,w,,e,v,f
6. Insert the following sequence of elements into an AVL tree, starting with empty tree 71, 41, 91, 56, 60, 30, 40, 80,50, 55. Also find the minimum array size to represent this tree.
7. Insert the following sequence of elements into an AVL tree, starting with empty tree 90, 80, 70, 100 ,50,40,30,10,60,20.Show proper rotation to maintain the tree as AVL.
8. Write algorithms or function to obtain traversals of a binary tree in preorder, postorder and inorder.
9. Explain Huffman algorithm. Construct Huffman tree for MAHARASHTRA with its optimal code.
10. Draw a binary tree with following traversals:  
    Inorder: B C A E G D H F I J  
    Preorder: A B C D E G F H I J
11. Draw a binary tree with following traversals:  
    Inorder: B I D A C G E H F  
    Postorder: I D B G C H F E A
12. Draw a binary tree with following traversals:  
    Inorder: Q B K C F A G P E D H R  
    Preorder: G B Q A C K F P D E R H
13. Draw a binary tree with following traversals:  
    Inorder: H K D B I L E A F C M J G

Preorder: A B D H K E I L C F G J M

Find the post order of the tree.

1. Construct a B-Tree of order 5 created by inserting the following elements

3,14,7,1,8,5,11,17,13,6,23,12,20,26,4,16,18,24,25,19

Also delete elements 6,23,3 from the constructed tree.

1. What is a B-Tree? Generate a B-Tree of order 4 with the alphabets arrive in the sequence as follows:

a g f b k d h m j e s i r x c l n t t u p

1. Generate a B-Tree of order 5 with the alphabets arrive in the sequence as follows:

a g f b k d h m j e s i r x c l n t t u p

What will be the resultant B-Tree after deleting keys j,t and d in sequence?

1. Why does time complexity of search operation in B-Tree is better than Binary Search Tree(BST)?
2. Write an iterative function to search a key in Binary Search Tree (BST).Write the algorithm for deletion of an element in binary search tree.
3. What is the difference between binary search tree and heap? For a given sequence of numbers , construct a heap and a BST.

34,23,67,45,12,54,87,43,98,75,84,93,31