

Introduction to Programming and Data Structures – Mock Test 3

Name:

Roll Number:

+++++

1. The preorder traversal of a binary search tree (BST) is 5, 1, 3, 2, 11, 9, 7, 10. Find the postorder traversals of the possible trees?

Answer:

2. Suppose a pair of stacks are constructed within a single two-dimensional array of size $n \times n$. They grow toward each other following a row-major traversal, starting from the top-left and bottom-right corner of the array. The tops of these stacks, say $top1 = (t1r, t1c)$ and $top2 = (t2r, t2c)$ (where push() and pop() will happen), are represented as a doublet of row and column number of the array. Initially, the tops of these two stacks are set to (0, 0) and ($n-1$, $n-1$), respectively. What will be the overflow condition for both the stacks?

Answer:

3. Evaluate the following postfix expression:
10 5 + 60 6 / * 8 -

Answer:

4. A minimum priority queue (MinPQ) is defined as a queue that allows insertion of elements from one particular end but allows deletion of only the minimum element present in the queue. Suppose $\text{MinPQ_ENQUEUE}(Q, i)$ denotes the insertion of the element i in an MinPQ, say Q , and $\text{MinPQ_DEQUEUE}(Q)$ denotes the deletion from Q and returning the minimum element. Let there be an MinPQ, say Q , with integer elements only. The elements in Q are required to be added together. At a time only two elements can be added and the cost of adding is proportional to the sum of their values. How can you compute the summation of its elements incurring the minimum cost using only the operations $\text{MinPQ_ENQUEUE}(Q, i)$ and $\text{MinPQ_DEQUEUE}(Q)$.

Answer:

5. What will be the number of internal nodes in a complete binary tree having n nodes?

Answer: