

CSN-102 DS Tutorial

Topic: Tree Data Structure

Question 1: The postorder traversal of a binary tree is 8, 9, 6, 7, 4, 5, 2, 3, 1. The inorder traversal of the same tree is 8, 6, 9, 4, 7, 2, 5, 1, 3. The height of a tree is the length of the longest path from the root to any leaf. The height of the binary tree above is?

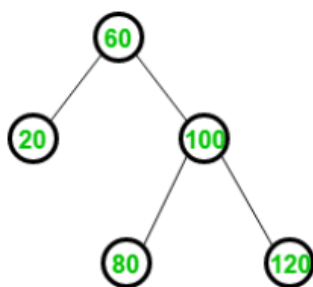
Question 2: The preorder traversal sequence of a binary search tree is- 30 , 20 , 10 , 15 , 25 , 23 , 39 , 35 , 42. What one of the following is the postorder traversal sequence of the same tree ?

- A. 10 , 20 , 15 , 23 , 25 , 35 , 42 , 39 , 30
- B. 15 , 10 , 25 , 23 , 20 , 42 , 35 , 39 , 30
- C. 15 , 20 , 10 , 23 , 25 , 42 , 35 , 39 , 30
- D. 15 , 10 , 23 , 25 , 20 , 35 , 42 , 39 , 30

Question 3: What is the maximum height of any AVL-tree with 7 nodes? Assume that the height of a tree with a single node is 0.

- A. 2
- B. 3
- C. 4
- D. 5

Question 4: Consider the following AVL tree. What will be the updated AVL tree after insertion of 70?



Question 5: Match the worst case time complexity for insertion and deletion operations in the following data structures.

- a) Unordered array
- b) Unordered linked list
- c) Sorted array
- d) Sorted linked list
- e) Max heap
- f) Binary search tree
- g) AVL tree

Question 6: What is the worst case time complexity of inserting n^2 elements into an AVL tree with n elements initially ?

- A. $O(n^2)$
- B. $O(n^2 \log n)$
- C. $O(n \log n)$

Question 7: Let Lastpost, Lastin, Lastpre be the last node visited in a postorder, inorder, and preorder traversals in a complete binary tree. Which of the following is correct ?

- A. Lastpost = Lastin
- B. Lastpost = Lastpre
- C. Lastin = Lastpre

Question 8: In a min-heap with n elements, the 11th smallest element can be found in

- A. $O(\log_2 n)$
- B. $O(n)$
- C. $O(1)$