1. While inserting the elements 71, 65, 84, 69, 67, 83 in an empty binary search tree (BST) in the sequence shown, the element in the lowest level is

A. 65

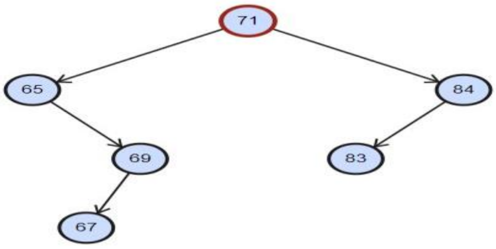
B. 67

C. 69

D. 83

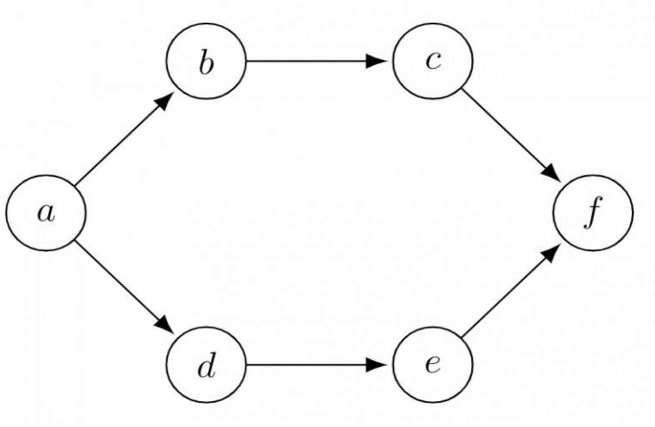
Answer: B

Explanation: The Constructed Binary Search Tree from the given Elements will be



Clearly, the element in the lowest level in the above BST is **67**.

2. Consider the following directed graph:



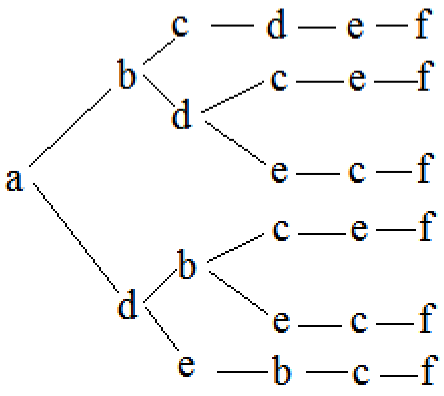
The number of different topological orderings of the vertices of the graph is _____________.

Answer: 6

Explanation: In topological sorting all nodes are like tasks and edges show the dependency among the tasks.

Node i to j an edge is there means task i must complete before task j.(in the mean time some other task may get complete after task i and before task j..but task i and j sequence need to be maintained)

Here in following 6 ways all the 6 tasks can get completed,(4!/(2!∗2!)=6)



3. In delete operation of BST, we need inorder successor (or predecessor) of a node when the node to be deleted has both left and right child as non-empty. Which of the following is true about inorder successor needed in delete operation?

A. Inorder Successor is always a leaf node

B. Inorder successor is always either a leaf node or a node with empty left child

C. Inorder successor may be an ancestor of the node

D. Inorder successor is always either a leaf node or a node with empty right child

Answer: B

Answer: Let X be the node to be deleted in a tree with root as 'root'. There are three cases for deletion 1) X is a leaf node: We change left or right pointer of parent to NULL (depending upon whether X is left or right child of its parent) and we delete X 2) One child of X is empty: We copy values of non-empty child to X and delete the non-empty child 3) Both children of X are non-empty: In this case, we find inorder successor of X. Let the inorder successor be Y. We copy the contents of Y to X, and delete Y. Sp we need inorder successor only when both left and right child of X are not empty. In this case, the inorder successor Y can never be an ancestor of X. In this case, the inorder successor is the leftmost node in right subtree of X. Since it is leftmost node, the left child of Y must be empty.

4. The following numbers are inserted into an empty binary search tree in the given order: 10, 1, 3, 5, 15, 12, 16 What is the height of the binary search tree ?

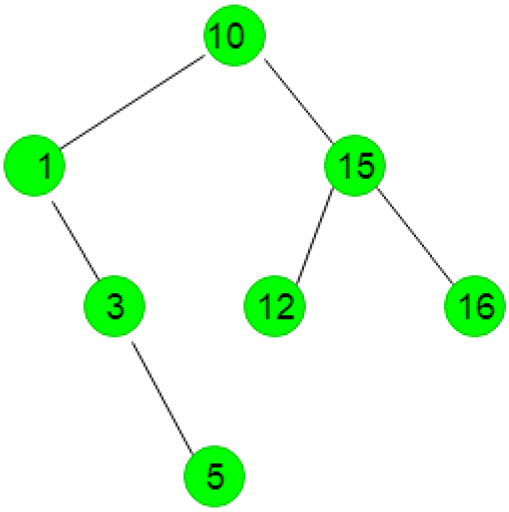
A. 3

B. 4

C. 5

D. 6

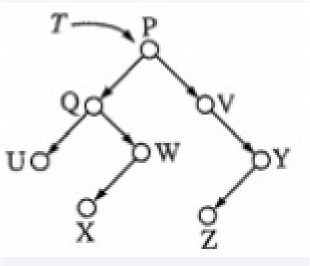
Answer: A



Explanation:

This tree has 4 level and height of tree is level - 1 So height of this tree will be 4-1 = 3

5. Consider the following binary search tree T given below: Which node contains the fourth smallest element in T?



A. Q

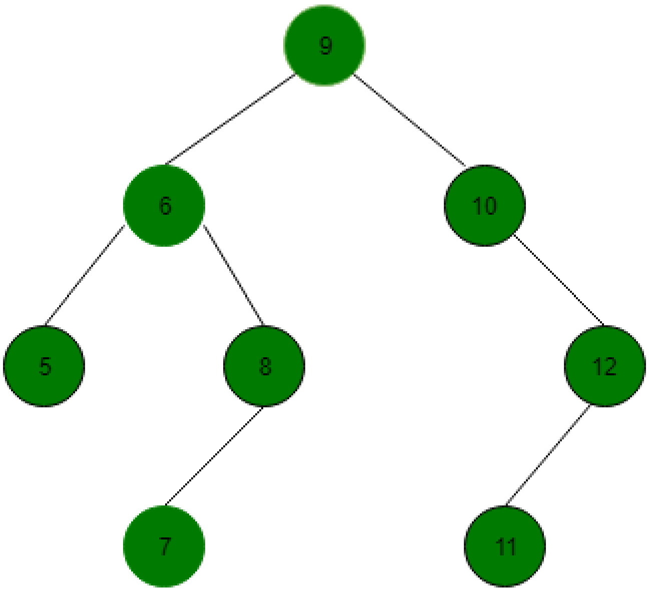
B. V

C. W

D. X

Answer: C

Explanation: In a BST, value (left node) < value(root) < value(right node) We can consider an example to find out the 4th smallest element:



From the above BST, we can clearly see that 8 is the fourth smallest element. So, option (C) is correct.