

Question 1 (1 point)

What does the following postfix expression evaluate to?

2 5 * 4 2 2 * / + 3 5 + -

Question 2 (1 point)

A ternary tree is a tree where each node can have up to three children. What is the maximum number of nodes in a ternary tree with height h ?

☐ $3^{h-1} - 1$

☐ $(3^{h+1} - 1)/2$

☐ 3^h

☐ $(3^h + 1)/2$

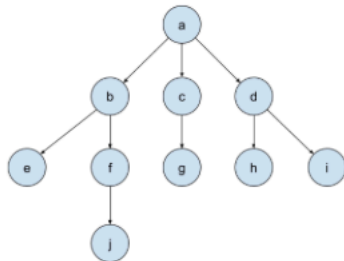
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Question 3 (1 point)

Consider the following tree. If we perform a depth-first traversal on it with a stack, what would be the content of the stack **after g has been visited**?



☐ { c, f, e, b }

☐ { b }

☐ { b, c }

☐ { i, h, d, a }

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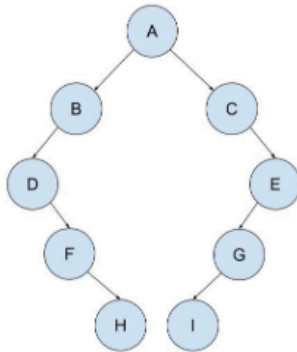
Question 4 (1 point)

Consider a binary tree whose in-order traversal is E I B A G C F H D and whose post-order traversal is I E B G F C D H A. Which is the pre-order traversal of the tree?

(separate each element with a space where the left is the first element visited and the right is the last element visited, example: A B C D E F)

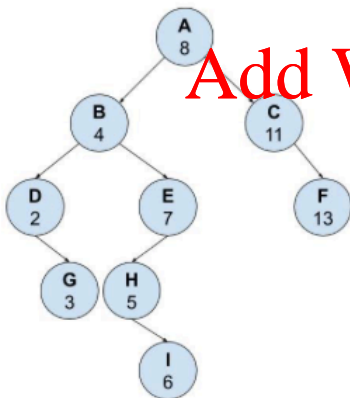
Question 5 (1 point)

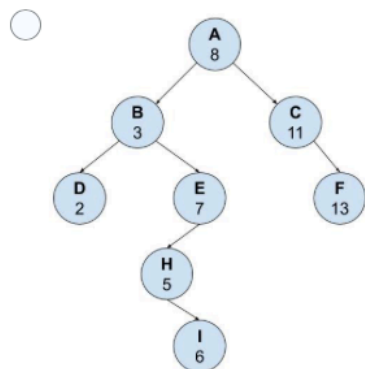
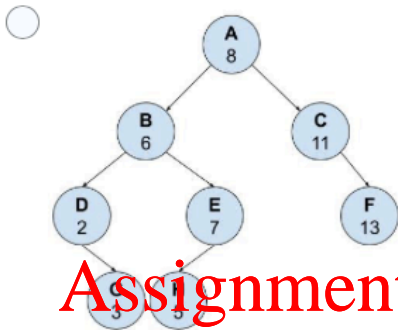
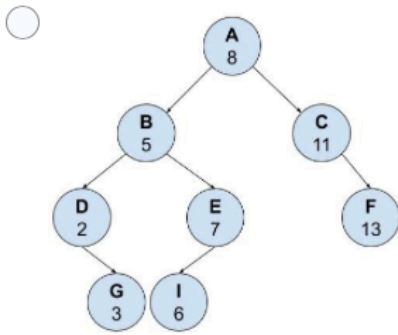
Given the following binary search tree, which node does findMax(A) return?



Question 6 (1 point)

Given the following binary search tree, in which letter denotes node name (eg. A) and number denotes node key value (eg. 8). Which one is the correct configuration of the tree after remove(A, 4) is executed? Use the remove algorithm in class.





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Question 7 (1 point)

Consider the following snippet of pseudocode. The input is the root of a binary search tree.

```
find_something(root) {  
    if (root == null)  
        return null  
    else{  
        cur = root  
        while (cur != null){  
            cur = cur.right  
        }  
        return cur  
    }  
}
```

What will this method return?

- ☐ The maximum element of the tree
- ☐ The minimum element of the tree
- ☐ null
- ☐ The rightmost element of the tree

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Question 8 (1 point)

In order to get the elements of a binary search tree in descending order, one has to traverse it in

- ☐ Preorder with right child before left child
- ☐ Inorder with right child before left child
- ☐ Postorder with left child before right
- ☐ Postorder with right child before left

Question 9 (1 point)

Given a minimum-heap H , give a tight $O()$ bound on the time complexity of a method that finds, but does not remove, the three smallest keys in H .

Assume the method creates and returns a list of the three smallest elements. To answer this question you need to think of how such a method might be implemented.

- ☐ $O(n \log(n))$
- ☐ $O(\log(n))$
- ☐ $O(3 \log(n))$
- ☐ $O(1)$

Question 10 (1 point)

What is the state of the following list after the first 3 iterations of buildHeapFast ?

SCRAMBLING

(No spaces required)
