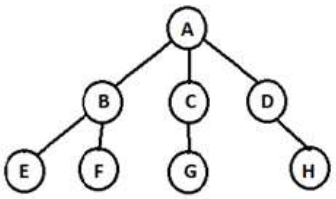
Started on	Sunday, 3 March 2024, 7:33 AM
State	Finished
Completed on	Sunday, 3 March 2024, 7:44 AM
Time taken	10 mins 54 secs
Marks	8.00/8.00
Grade	**10.00** out of 10.00 (**100**%)

Question 1

Correct

Mark 1.00 out of 1.00

What is(are) the leaf node(s) in thee following K-ary Tree



- [x] a. F ✔
- [x] b. G ✔
- [ ] c. A
- [ ] d. B

The correct answers are: F, G

Question 2

Correct

Mark 1.00 out of 1.00

What is the number of internal nodes of a complete k-ary tree?

a. $k^{(h-1)}$

b. $(h^k - 1)/(h - 1)$

c. $(k^h - 1)/(k - 1)$ ✔

d. $(k^h - 1)/k$

The correct answer is:
$(k^h - 1)/(k - 1)$

Question 3

Correct

Mark 1.00 out of 1.00

Following is a pseudo code to check given two Binary Trees are identical or not.

```
// Data structure for binary tree
class Node{
    int key;
    Node left, right;
}

//Algorithm
int isEqual(Node a, Node b)
{
    if ( Condition 1 )
        return true;

    return ( Condition 2 ) &&
            ( Condition 3 ) &&
            isEqual( a.left, b.left ) &&
            isEqual( Condition 4 );
}
```

select correct conditions for appropriate places.

Condition 1 — x == null && y == null ✔

Condition 4 — a.right, b.right ✔

Condition 3 — a.key == b.key ✔

Condition 2 — a != null && b!=null ✔

The correct answer is: Condition 1 → x == null && y == null, Condition 4 → a.right, b.right, Condition 3 → a.key == b.key, Condition 2 → a != null && b!=null

Question 4

Correct

Mark 1.00 out of 1.00

Select whether the following statement is True/False.

Binary Search is appropriate for linked lists

Select one:

- True
- False ✔

The correct answer is 'False'.

Question 5

Correct

Mark 1.00 out of 1.00

Consider numbers 3, 9, 1, 17, 14, 22, 20. These numbers are inserted in to a balanced binary tree, Which tree traversal method would output the following sequence.

14, 3, 1, 9, 20, 17, 22

a. Non of the above

b. Postorder

c. Preorder ✔

d. Inorder

The correct answer is: Preorder

Question 6

Correct

Mark 1.00 out of 1.00

Which of the following statement(s) is/are correct regarding a binary search tree?

- [x] a. Basic operations on any randomly built binary search tree take time proportional to the height of the tree. ✔
- [ ] b. Basic operations on any randomly built binary search tree take Θ(lg n) time.
- [ ] c. It takes O(lg n) time to walk an n-node binary search tree.
- [x] d. The expected height of a randomly built binary search tree is O(lg n). ✔

The correct answers are: The expected height of a randomly built binary search tree is O(lg n)., Basic operations on any randomly built binary search tree take time proportional to the height of the tree.

Question 7

Correct

Mark 1.00 out of 1.00

The number of possible binary search trees with 5 nodes is

Answer:

42 ✔

Explanation

Refer to https://www.geeksforgeeks.org/total-number-of-possible-binary-search-trees-with-n-keys/. There is also a Python/ C++ code available at this link.

Also refer to Catalan Numbers @ https://en.wikipedia.org/wiki/Catalan_number

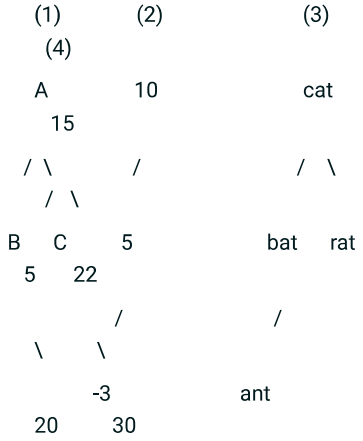
The correct answer is: 42

Question 8

Correct

Mark 1.00 out of 1.00

Which of the following binary trees are BSTs?



a. 1,4

b. 2,4

c. 2,3 ✔

d. None of these

The correct answer is: 2,3