What is the worst case time complexity for search, insert and delete operations in a general Binary Search Tree?

O(n) for all **Correct**

O(Logn) for all

O(Logn) for search and insert, and O(n) for delete

O(Logn) for search, and O(n) for insert and delete

What is the maximum number of children that a binary tree node can have?

1

4

3

2 **Correct**

The depth of complete binary tree with n nodes is

log 2 n

log 2 (n - 1) + 1

log 2 (n + 1) - 1

None of these **Correct**

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?

Inorder Successor is always a leaf node

Inorder successor is always either a leaf node or a node with empty left child **Correct**

Inorder successor may be an ancestor of the node

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

Which of the following pair's traversals on a binary tree can build the tree uniquely?

post-order and pre-order

post-order and in-order **Correct**

post-order and level order

level order and preorder

Which of the following is false about a binary search tree?

The left child is always lesser than its parent

The right child is always greater than its parent

The right child is always greater than its parent

None of these **Correct**

What does the following piece of code does give root as the root of the BST

```
console.log(root.data());
func(root.left());
func(root.right());
```

Perorder traversal **Correct**

In order traversal

Post order traversal

Level Order traversal

A binary tree T has n leaf nodes. The number of nodes of degree 2 in T is

n-1 **Correct**

n

2^n

log 2n

How many distinct binary search trees can be created out of 4 distinct keys?

4

14 **Correct**

24

42

Children of the same parent are called?

Node

Sibiling **Correct**

Child Node

None of these

A binary search tree T contains n distinct elements. What is the time complexity of picking an element in T that is smaller than the maximum element in T?

Θ(nlogn)

Θ(n)

Θ(logn)

Θ(1) **Correct**

A full binary tree can be generated using

post-order and pre-order traversal **Correct**

pre-order traversal

post-order traversal

in-order traversal

What is the space complexity of the post-order traversal in the recursive fashion? (d is the tree depth and n is the number of nodes)

O(1)

O(nlogd) **Correct**

O(logd)

O(d)

Which of the following traversal outputs the data in sorted order in a BST?

Preorder

Inorder **Correct**

Post Order

Level Order

The pre-order and in-order are traversals of a binary tree are T M L N P O Q and L M N T O P Q. Which of following is post-order traversal of the tree?

L N M O Q P T **Correct**

N M O P O L T

L M N O P Q T

O P L M N Q T

What are the worst case and average case complexities of a binary search tree?

O(n), O(n)

O(logn), O(logn)

O(logn), O(n)

O(n), O(logn) **Correct**

What are the conditions for an optimal binary search tree and what is its advantage?

The tree should not be modified and you should know how often the keys are accessed, it improves the lookup cost **Correct**

You should know the frequency of access of the keys, improves the lookup time

The tree can be modified and you should know the number of elements in the tree before hand, it improves the deletion time

None of these

The indegree of _______ of a tree is always zero.

a branch node

any node

the root node

a leaf node **Correct**

Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?

7 5 1 0 3 2 4 6 8 9

0 2 4 3 1 6 5 9 8 7

0 1 2 3 4 5 6 7 8 9 **Correct**

9 8 6 4 2 3 0 1 5 7

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?

3 **Correct**

4

5

6

Which of the following statements about binary trees is NOT true?

Every binary tree has at least one node. **Correct**

Every non-empty tree has exactly one root node.

Every node has at most two children.

Every non-root node has exactly one parent.

Given a binary search tree, which traversal type would print the values in the nodes in sorted order?

Preorder

Inorder **Correct**

Post Order

None of these

What is the right view of the following tree

1

/ \

2 3

\ / \

6 4 5

/

7

1,3,5,7 **Correct**

1,2,6,7

1,3,5

1,2,6

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 (the height is the maximum distance of a leaf node from the root)?

2

3 **Correct**

4

6

The balance factor of a node in a binary tree is defined as

addition of heights of left and right subtrees

height of right subtree minus height of left subtree

height of left subtree minus height of right subtree **Correct**

height of right subtree minus one

Is this a binary search tree?

55

/ \

17 60

/ \ / \

5 20 42 105

/ \ \

3 9 55

Yes

No **Correct**

Not Sure

None of these

Which of the following traversing algorithm is not used to traverse in a tree?

Post order

Pre order

Post order

Randomized **Correct**

How many types of insertion are performed in a binary tree?

1

2 **Correct**

3

4

Consider the following Binary Search Tree

10

/

5 20

/ /

4 15 30

/

11

If we randomly search one of the keys present in above BST, what would be the expected number of comparisons?

2.75

2.25

2.57 **Correct**

3.25

The average depth of a binary tree is given as?

O(N)

O(√N)

O(N2)

O(log N) **Correct**

What is the average case time complexity for finding the height of the binary tree?

h = O(loglogn)

h = O(nlogn)

h = O(n)

h = O(log n) **Correct**

Consider the following data and specify which one is Preorder Traversal Sequence, Inorder and Postorder sequences.

S1: N, M, P, O, Q

S2: N, P, Q, O, M

S3: M, N, O, P, Q

S1 is preorder, S2 is inorder and S3 is postorder

S1 is inorder, S2 is postorder and S3 is preorder **Correct**

S1 is postorder, S2 is inorder and S3 is preorder

In a full binary tree if number of internal nodes is I, then number of leaves L are?

L = 2*I

L = I + 1 **Correct**

L = I – 1

L = 2*I – 1

Which of the following traversals is sufficient to construct BST from given traversals 1) Inorder 2) Preorder 3) Postorder

Any one of the given three traversals is sufficient

Either 2 or 3 is sufficient **Correct**

2 and 3

1 and 3

How many orders of traversal are applicable to a binary tree (In General)?

1

2

3 **Correct**

4

If binary trees are represented in arrays, what formula can be used to locate a left child, if the node has an index i?

2i+1

2i

What is the possible number of binary trees that can be created with 3 nodes, giving the sequence N, M, L when traversed in post-order.

15

3

5 **Correct**

8

The number of edges from the root to the node is called ___________ of the tree.

Height

Depth **Correct**

Length

Width

You are given the postorder traversal, P, of a binary search tree on the n elements 1, 2, ..., n. You have to determine the unique binary search tree that has P as its postorder traversal. What is the time complexity of the most efficient algorithm for doing this?

O(Logn)

O(n) **Correct**

O(nLogn)

none of the above

Which of the following would be a possible in order traversal?

1,5,7,9,10 **Correct**

9,8,7,6,5

6,4,3,8,7

none of the above