

VIRTUAL UNIVERSITY OF PAKISTAN

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TEAM HADI(VU LAHORE)

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WARNING: Team HADI is not responsible for any mistake or wrong answer. All students reading and using this document may check and confirm the answers at their own.



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Best of luck!



Question No : 1 of 26

Marks: 1 (Budgeted Time 1 Min)

An array x of 100 integers is declared as ,

Answer (Please select your correct option)

int x = [100];

int x[100];

integer array x = 100;

integer x [] = 100;

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Question No : 2 of 26

Marks: 1 (Budgeted Time 1 Min)

What is the maximum depth of recursive calls a function may make?

Answer (Please select your correct option)

- 1
- 2
- n (where n is the argument)
- There is no fixed maximum



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Question No : 3 of 26

Marks: 1 (Budgeted Time 1 Min)

A Linear Data Structure is the data structure in which data elements are arranged in a sequence or a linear list. Which of the following is Non Linear Data Structure?

Answer (Please select your correct option)

Arrays



Linked Lists



Binary Search Trees



Stack



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Question No : 4 of 26

Marks: 1 (Budgeted Time 1 Min)

The new operation in C++ for dynamically allocating memory returns,

Answer (Please select your correct option)

- Size of the memory it has allocated
- Pointer to the memory it has allocated
- Both size and pointer to the memory it has allocated
- Value of the memory it has allocated



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Question No : 5 of 26

Marks: 1 (Budgeted Time 1 Min)

In _____, a programmer uses two pointers in the node, i.e. one to point to next node and the other to point to the previous node.

Answer (Please select your correct option)



Linked list



Doubly-linked list



Array



Structure

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Question No : 6 of 26

Marks: 1 (Budgeted Time 1 Min)

The expression $AB+C^*$ is called ?

Answer (Please select your correct option)

Prefix expression

Postfix expression

Infix expression

Prefix and Infix expression



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Question No : 7 of 26

Marks: 1 (Budgeted Time 1 Min)

Consider the function X as under

```
int X (int& Value)
{
return Value;
}
```

Now **a** and **b** are integers in a calling function. Which one of the following is a valid call to the above function X ?

Answer (Please select your correct option)

a = X (b);

a = X (&b);

a = X (*b);

a = X (&*b);

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Question No : 8 of 26

Marks: 1 (Budgeted Time 1 Min)

Each node in Binary Search Tree has

Answer (Please select your correct option)

1 pointer

2 pointers

3 pointers

4 pointers



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Question No : 9 of 26

Marks: 1 (Budgeted Time 1 Min)

Suppose n is the number of nodes in a complete Binary Tree, then maximum steps required for a search operation are

Answer (Please select your correct option)

$\log_2 (n+1) - 1$



$\log_2 (n+1)$

$\log_2 (n) - 1$

$\log_2 (n)$

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Question No : 10 of 26

Marks: 1 (Budgeted Time 1 Min)

The **next** field in the last node of a singly-linked list is set to _____.

Answer (Please select your correct option)

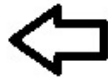
NAN



1



NULL



-1



Correct answer solved by hadi

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Question No : 11 of 26

Marks: 1 (Budgeted Time 1 Min)

Consider the following function:

```
void test_a(int n)
{
    cout << n << " ";
    if (n>0)
```

Answer (Please select your correct option)

4 2 0

0 2 4

4 2

2 4

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Question No : 12 of 26

Marks: 1 (Budgeted Time 1 Min)

A queue where the dequeue operation does not depend upon FIFO, is called :

Answer (Please select your correct option)

- enqueue
- simple queue
- stack
- priority queue

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Question No : 13 of 26

Marks: 1 (Budgeted Time 1 Min)

$a * (b+c) - d$ is an example of ----- expression.

Answer (Please select your correct option)

infix

prefix

postfix

allfix

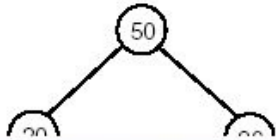
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Question No : 14 of 26

Marks: 1 (Budgeted Time 1 Min)

Below is a Binary Search Tree (BST). If we delete the value 50 from the root node, what would be the value in the root of the remaining tree?



Answer (Please select your correct option)

50

60

70

80

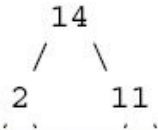
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Question No : 15 of 26

Marks: 1 (Budgeted Time 1 Min)

Consider the following tree:



Answer (Please select your correct option)

2

4

6

9

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Question No : 16 of 26

Marks: 1 (Budgeted Time 1 Min)

Which one of the following calling methods does not change the original value of the argument in the calling function?

Answer (Please select your correct option)

Call by passing the value of the argument



Call by passing reference of the argument

Call by passing the address of the argument

Call by passing pointer of the argument

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Question No : 17 of 26

Marks: 1 (Budgeted Time 1 Min)

Which of the following statement is NOT true for reference variable ?

Answer (Please select your correct option)

Once a reference is created, it cannot be later made to reference another object.

References cannot be NULL.

References can be uninitialized.

It is not possible to refer directly to a reference object after it is defined.



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Question No : 18 of 26

Marks: 1 (Budgeted Time 1 Min)

Searching an element in an AVL tree takes maximum _____ time (where n is number of nodes in AVL tree)

Answer (Please select your correct option)

$\log_2(n+1)$

$\log_2(n+1) - 1$

$1.44 \log_2 n$

$1.66 \log_2 n$



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Question No : 19 of 26

Marks: 1 (Budgeted Time 1 Min)

In the post-order traversal of a binary search tree, nodes process as:

Answer (Please select your correct option)

Left-subtree , Right-subtree , Root



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Right-subtree , Root , Left-subtree

Left-subtree , Root , Right-subtree

Right-subtree , Left-subtree , Root

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Question No : 20 of 26

Marks: 1 (Budgeted Time 1 Min)

The main use of AVL tree is:

Answer (Please select your correct option)

Searching of data



Storing of data

Insertion of data

Security of data

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Question No : 21 of 26

Marks: 2 (Budgeted Time 4 Min)

How can the dangling reference problem be avoided ?

Answer (Please [click here](#) to Add Answer)



Normal Arial 12 B I U

To avoid dangling reference, don't return the reference of a local variable (transient) from a function.

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Question No : 22 of 26

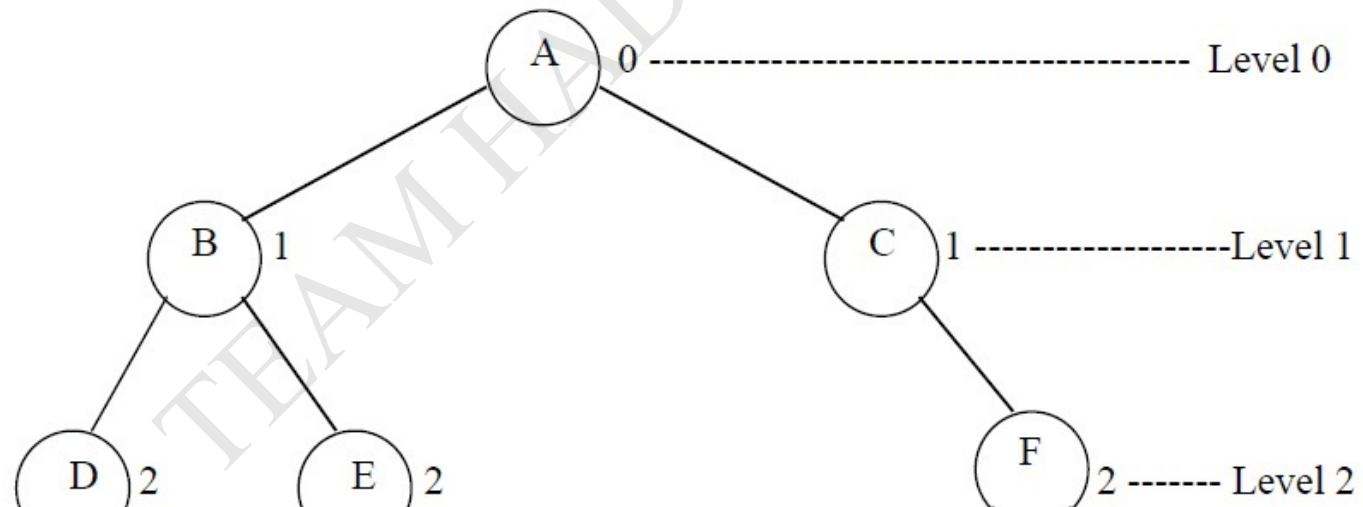
What is "level" in binary tree ?

Answer (Please [click here](#) to Add Answer

The level of a node in a binary tree is defined as follows:

- Root has level 0,
- Level of any other node is one more than the level its parent (father).
- The *depth* of a binary tree is the maximum level of any leaf in the tree.

To understand level of a node, consider the following figure 11.13. This figure shows the same tree of figure 11.2, discussed so far.

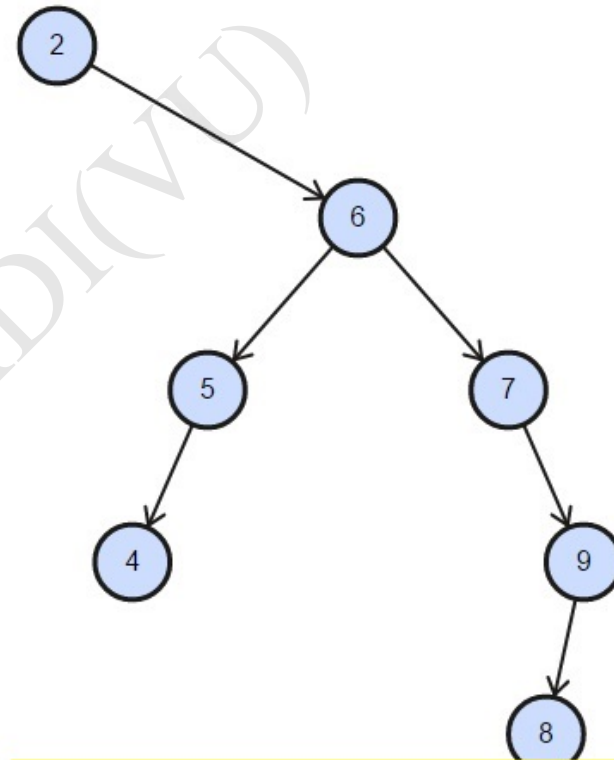
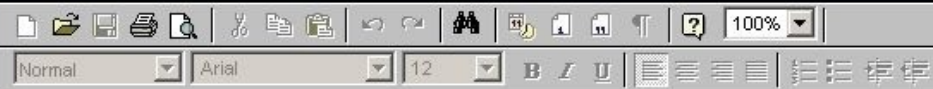


Question No : 23 of 26

3 (Budgeted Time 6 Min)

Draw a BST that is as tall as possible and contains the values '2', '6', '5', '4', '7', '9', '8'.

Answer (Please [click here](#) to Add Answer)



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Define the following terms

- 1) Reference variables
- 2) Dangling reference
- 3) Const keyword

Answer (Please [click here](#) to Add Answer)



Normal Arial 12 B I U

Ref Vari: A reference variable is an alias, that is, another name for an already existing variable. Once a reference is initialized with a variable, either the variable name or the reference name may be used to refer to the variable.

Dangling: A dangling reference is a reference to an object that no longer exists.

Const: By writing *const*, we are saying that parameter must remain constant for the life of the function.

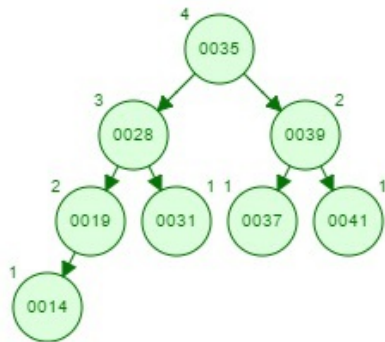
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Question No : 25 of 26

Marks: 5 (Budgeted Time 10 Min)

Show the result of inserting the values **35, 19, 41, 39, 37, 28, 31, 14** into an empty AVL Tree.
You have to show only the complete AVL tree, steps are not required.

Answer (Please [click here](#) to Add Answer)



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Write down the algorithm (Steps) for level order traversing of a binary tree.

The name of the method is *levelorder* and it is accepting a pointer of type *TreeNode* $\langle int \rangle$. This method will start traversing tree from the node being pointed to by this pointer. The first line (line 3) in this method is creating a queue *q* by using the *Queue* class factory interface. This queue will be containing the *TreeNode* $\langle int \rangle$ * type of objects. Which means the queue will be containing nodes of the tree and within each node the element is of type *int*.

The line 5 is checking to see, if the *treeNode* pointer passed to the function is pointing to NULL. In case it is NULL, there is no node to traverse and the method will return immediately.

Otherwise at line 6, the very first node (the node pointed to by the *treeNode* pointer) is added in the queue *q*.

Next is the *while* loop (at line 7), which runs until the queue *q* does not become empty. As we have recently added one element (at line 6), so this loop is entered.

At line 9, *dequeue()* method is called to remove one node from the queue, the element at *front* is taken out. The return value will be a pointer to *TreeNode*. In the next line (line 10), the *int* value inside this node is taken out and printed. At line 11, we check to see if the left subtree of the tree node (we've taken out in at line 9) is present. In case the left subtree exists, it is inserted into the queue in the next statement at line 12. Next, we see if the right subtree of the node is there, it is inserted into the queue also. Next statement at line 15 closes the *while* loop. The control goes back to the line 7, where it checks to see if there is some element left in the queue. If it is not empty, the loop is entered again until it becomes empty.

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