Department of Computer Science and Engineering,
Anna University, Chennai- 600025
CS23302 – Data Structures and Algorithms
Practical
July – November 2026
Year/Sem/Batch : II/III/ N

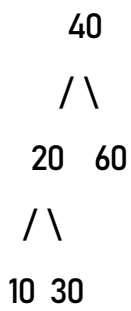
Exercise: 09	AVL Trees	28 – Aug - 2026

Observation (5 Marks)

1. What is the balance factor of an AVL tree node?
2. Which rotation is required when a node becomes unbalanced due to insertion in the left subtree of its left child? Give an Example.
3. What are the four cases of AVL imbalance?
4. If: Balance Factor = -2 and the newly inserted node is in the right subtree of the right child, which rotation is required?
5. Complete the function to calculate the balance factor of an AVL node.

```
int getBalance(Node *root)
{_____;}
```

6. What is the output of the following traversal?



7. Identify the error in the following AVL insertion code:

   if(balance > 1 && key > root->left->key) return rightRotate(root);

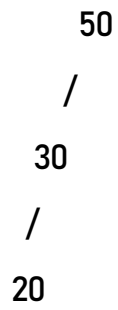
   What rotation is actually required?

8. Write the missing statement for left rotation:

   Node *y = root->right; Node *T2 = y->left; y->left = _____; root->right = _____;

9. if the balance factor of a node is -2 and the new key is inserted into the right subtree of its right child, which rotation should be performed?

10. What will be the balance factor of the following node?



Execution (15 Marks)

1. Develop a menu-driven program using an AVL Tree for hospital patient management. Each node stores Patient ID, Patient Name, Priority, Height, Left and Right pointers. Use Patient ID as the key.

The program should support:

- Register patient
- Search patient
- Discharge patient
- Inorder, Preorder and Postorder traversal
- Display tree height and balance factor

The program must perform AVL insertion and deletion with LL, RR, LR and RL rotations and reject duplicate Patient IDs.

2. A company maintains employee records using an AVL Tree, where each employee is identified by a unique Employee ID. Implement a menu-driven program to:

1. Insert a new employee.
2. Delete an employee by ID.
3. Search for an employee.
4. Display the employees using Inorder traversal.
5. Display the height and balance factor of the tree.

The program must automatically maintain the AVL property using LL, RR, LR and RL rotations after insertion and deletion.

Test Input:
50, 30, 70, 20, 40, 60, 80, 10, 25