**Lab 12 & 13 Class Task**

BST & AVL Tree

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Q. 5 Answer:

To insert a new student record with roll number 15 into the AVL tree and ensure that the tree remains balanced, follow these steps:

**Initial AVL Tree**:

Student 1 with roll number 2 (left child of root)

Student 2 with roll number 30 (right child of root)

Student 3 with roll number 38 (right child of Student 2)

Student 4 with roll number 78 (right child of Student 3)

Student 5 with roll number 92 (right child of Student 4)

**Inserting Student 6 with Roll Number 15**:

Start by inserting the new student with roll number 15 as a leaf node in the correct position based on its roll number.

Since 15 is less than 30 (the root's roll number), it becomes the left child of Student 2 (30).

**Balancing the AVL Tree**:

Check the balance factor of each node in the path from the newly inserted node (15) to the root. If any node has a balance factor outside the range [-1, 1], perform rotations to balance the tree.

**Height of the AVL Tree**:

After inserting Student 6 (15) and balancing the tree, the height of the AVL tree will be 3.