ADA – Test 1

1. Consider the following if-else statement:

```
if (condition)
  sequence_1
else
  sequence_2
```

If **`sequence_1`** is **`O(n)`** and **`sequence_2`** is **`O(1)`**, what is the worst-case running time for the whole if-else statement? ***(1p)***

2. Implement an algorithm that returns the minimum key from a given BST. ***(2p)***

3. There is a tree where the left subtree contains 300 nodes, and the right subtree contains 400 nodes. For preorder, inorder, and postorder traversals, how many nodes are processed before the root? ***(1p)***

4. Explain the general case of balancing an avl tree if, after an insertion, the left-right subtree becomes too high. ***(1p)***

5. What is the maximum height of any AVL tree with 8 nodes? Draw a tree which supports your statement. ***(2p)***

6. The following words are inserted into an initially empty Trie tree: “rocketed”, “rock”, “rocket” (in this order). Draw the resulting tree. ***(1p)***

7. Insert into an initially empty B-tree with minimum degree t = 3 the following values: 9, 8, 7, 6, 5, 4, 3, 2, 1 (in this order). Draw the tree before and after each split. ***(1p)***