This quiz has 4 questions, for a total of 10 points.

1. **3 points** Draw the result of deleting the node with key 6 from the following Binary Search Tree.

   ![Binary Search Tree](image)

   **Solution:** 2 points for moving the successor or predecessor to the deleted node’s position. 1 point for a resulting tree that is a BST and includes all the nodes except the deleted one.

   ![Corrected Trees](image)

2. **3 points** What code needs to be filled into the blanks labeled (a), (b), and (c) to finish this algorithm that searches within a Binary Search Tree rooted at node n for the node whose key is smaller than all the other nodes in the tree.

   ```python
   def greater_ancestor(x):
       p = x.parent
       if ___(a)___:
           return greater_ancestor(p)
       else:
           return p
   def tree_successor(x):
       if ___(b)___:  # (b) x.right
           return ___(c)___ # (c) tree_minimum(x.right)
       else:
           return greater_ancestor(x)
   ```

   **Solution:** 1 point for each correct answer below.

   (a) p and x == p.right
   (b) x.right
   (c) tree_minimum(x.right)
3. **2 points** What is the output, if any, of the following Python program?

```python
def g(x, y):
    return x.w + y.w
class C:
    def m(self, b):
        return g(b, self)
    def __init__(self, j):
        self.w = j
a = C(1)
b = C(2)
print(a.m(b))
```

**Solution:** 2 points for the correct output, which is

3

4. **2 points** Write down the sequence of keys from the following Binary Search Tree, ordering according to the pre-order traversal strategy.

```
   15
  /   \
 3     45
 /     /
7      22
```

**Solution:** 2 points for the correct sequence, which is:

15, 3, 7, 45, 22

(1 point if the sequence is close, such as missing one number.)