Abstract Data Types (ADT) Test 1

1. Which of the following is a last-in-first-out (LIFO) data structure?
   A) stack
   B) queue
   C) linked list
   D) array

2. Which of the following is a first-in-first-out (FIFO) data structure?
   A) stack
   B) queue
   C) linked list
   D) array

Questions 3 and 4 refer to the following code.

```
Stack<Integer> s = new Stack<>();

s.push(10);
s.push(15);
s.push(20);
System.out.println(s.pop() + s.pop());               // Line 1
s.push(25);
s.push(50);
s.pop();
System.out.println(s.peek() + s.pop() + s.pop());   // Line 2
```

3. What is output on Line 1?
   A) 25
   B) 20
   C) 45
   D) 35

4. What is output on Line 2?
   A) 60
   B) 95
   C) 125
   D) 45

5. What is output by the following code segment?

```
String str = "REDBLUE";
Stack<String> stack = new Stack<>();
for (int i=0; i < str.length(); i++)
    stack.push(str.substring(i, i+1);

while(!stack.isEmpty())
    System.out.print(stack.pop());
```

A) ULBDER
B) EEEEEEE
C) REDBLUE
D) EULBDER

6. What is output by the following code segment?

```
Queue<String> queue = new LinkedList<>();
queue.add("A");
queue.add("B");
queue.add("C");
System.out.println(queue.remove());
```
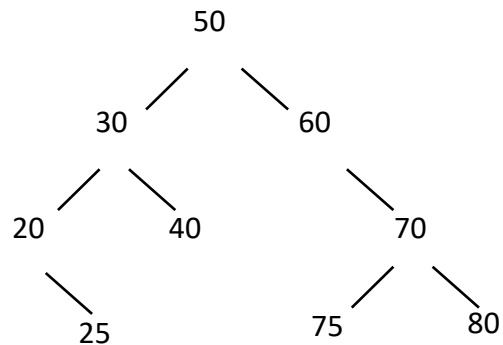
A) A
B) B
C) C
D) ABC

7. What is output by the following code segment?

```
Queue<Integer> queue = new LinkedList<>();
for (int i = 0; i < 10; i += 2)
    queue.add(i);

while (!queue.isEmpty())
    System.out.print(queue.remove());
```

A) 024
B) 02468
C) 86420
D) 0246810

Questions 8 – 10 refer to the following tree diagram.

8. Which of the following list of numbers produces the binary search tree shown above? Assume the numbers were inserted into the tree structure from left to right.

    A) 25 20 40 30 50 75 80 70 60
    B) 50 60 30 70 25 80 20 40 75
    C) 50 30 60 70 40 20 25 80 75
    D) 25 75 80 20 40 70 30 60 50

9. Which of the following list of numbers correctly shows a preorder traversal of the tree shown above?

    A) 50 30 20 25 40 60 70 75 80
    B) 20 25 30 40 50 60 70 75 80
    C) 25 20 40 30 75 80 70 60 50
    D) 50 30 60 20 40 70 25 75 80

10. Which of the following list of numbers correctly shows an inorder traversal of the tree shown above?

    A) 50 30 20 25 40 60 70 75 80
    B) 20 25 30 40 50 60 70 75 80
    C) 25 20 40 30 75 80 70 60 50
    D) 50 30 60 20 40 70 25 75 80