Question - 1

SCORE: **7 points**

What is the worst case complexity of the code given below?

Note that *l =aN, m = bN, n = cN*, where *a, b,* and *c* are constants.

```
for(int i = 0; i<l;i++) {
    for(int j = 0; j<m ;j++) {
        //do foo
    }
    for(int k = 0; k< n;k++) {
        //do bar
    }
}
```

- ○ $O(k^2)$
- ● $O(N^2)$
- ○ $O(N)$
- ○ $O(N*logN)$
- ○ $O(N^3)$

Question - 2

SCORE: **7 points**

equals(), hashCode() and compareTo()

Please choose the correct statements:

- ● If x.equals(y) is true, then x.hashCode() == y.hashCode() is true
- ○ If x.hashCode() == y.hashCode() is true, then x.equals(y) is true
- ● If x.equals(y) is true, then x.compareTo(y) == 0
- ○ If x.compareTo(y) == 0, then x.equals(y) == true

Question - 3

SCORE: **7 points**

Stack, Queue, Bag, ArrayList

A data *buffer* is a region to temporarily store data while it is being moved from one place to another, Typically, the data is stored in a buffer as it is retrieved from an input device or just before it is sent to an output device. which of the following data structures is best suited to being used as a buffer?

- Stack
- Queue
- Bag
- ArrayList

Question - 4

SCORE: **29 points**

Bag

Implement Bag Data structure.
Complete the code and run unit test.