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2016/2017 First Semester Test 2
COSC 211 Object Oriented Programming I

Date: February 10, 2017   **Time Allowed**: 60 Minutes

Instructions: Attempt **Question 1 and any other two** questions.

1. (**20 marks**). An arithmetic progression (AP) is a sequence of numbers such that the difference between any two consecutive terms is constant. For instance, the sequence 1,2,3,4,5,6,7,8,9,10... is an AP with first term 1, common difference 1 and number of terms 10. Also the sequence 5, 7, 9, 11, 13, 15 is an AP with first term 5, common difference of 2 and number of terms 6.
    a. (**7 marks**). Create an AP class with three fields: first term of type **double**, common difference of type **double** and number of terms of type **int**. Your class should have the necessary getters and setters, and two constructors – a no-args constructor and one that sets the values of the three fields.

b. (**9 marks**). There should be a method that returns the sum of the AP (using a loop), and a method that returns the value of the nth term. [The nth term is given by $a + (n - 1)d$.]

c. (**4 marks**). Write test code that will instantiate at least three objects from this class and demonstrate the use of its methods. In each case the values of the fields should be entered by the user from the keyboard.

2. (**10 marks**). Study the following code segment carefully and write down its output, if any.

```
String inputLine = "(2+5)/(10-1)";
StringTokenizer tokenizer = new StringTokenizer(inputLine,"+-/",true);
while(tokenizer.hasMoreTokens())
    System.out.println(tokenizer.nextToken());
```

3. (**10 marks**). Answer both the following questions
   a. (**5 marks**) Study the following code segment and write down its output.

Code segment	Output
```for(i=0; i<7; ++i){ for (j=0;j<i; ++j) System.out.println(i*j); }```	

   b. (**5 marks**). Write Java statement(s) to create an object of the ShoppingBasket class below:

```
public class ShoppingBasket{
  private ShoppingBasket sb;
  private double unitPrice;
  private int quantity;
  public ShoppingBasket(ShoppingBasket s, double p, int q){
    sb  = s;
    unitPrice = p;
    quantity = q;
  }
  //  code hidden for brevity ...
}
```

4. (**10 marks**). Create a one-dimensional array of 1000 objects of the AP class in Question 1. Initialize the even entries in the array with AP objects.