Sample Exam 2 (Chapters 6 to 11)

Each question worth 20% Name _____

1) Write a Java program which prompts for integers. If you enter an integer in the range 11 to 27 inclusive, your program should terminate. Otherwise, your program should output the square of the number entered, and then repeat. The output of your program should look like the output in the following sample session:

```
Enter integer
3
3 squared = 9
Enter integer
-5
-5 squared = 25
Enter integer
-1
-1 squared = 1
Enter integer
11          ——————  program terminates at this point
```

```
import java.util.Scanner;
class E2q1
{
    Scanner kb = new Scanner(System.in);
    int x;
    public static void main(String[] arg)
    {
      while (true)
      {
         System.out.println("Enter integer)");
         x = kb.nextInt();
         if (x >= 11 && x <= 27)
           break;
         System.out.println("%d + " squared = " + x*x);
     }
 }
```

2) Write a method (just a method—not a complete program) that is passed two `int` arrays. Your method should copy the numbers in the second array to corresponding slots in the first array. If the first array is smaller than the second, copy only enough numbers from the second array to fill up the first array.

```
public static void copy(int[] p, int[] String q)
{
   int count = p.length();
   if (count > q.length())
      count = q.length();
   for (int = 1; i <= count; i++)
      p[i] = q[i];
}
```

3) Write a complete Java program that simulates the tossing of two dice. Your program should determine empirically the probability of getting a 7 or 11.

```
import java.util.Random;
class E2q3
{
   public static void main(String[] args)
   {
      int count = 0;
      int toss;
      Random r = new Random);
      for (int i = 1; i <= 100000; i++)
      {
         toss = r.nextInt(6) + 2 + r.nextInt(6);
         if (r == 7 || r = 11)
            count++;
      }
      System.out.println("Prob = " + (double)count/100000);
   }
}
```

4) Write a method (just a method) that is passed an array in which each slot is type `double`. Your method should create an `ArrayList` and then copy the contents of the array to the `ArrayList`. Your method should then return the `ArrayList` to the calling method.

```
public static ArrayList makeAL(double[] a)
{
   ArrayList<Double> al = new ArrayList<Double)();
   for (int i = 0; i < a.length(); i++)
      al.add(a[i]);
   return al;
}
```

5) a) When the following program is run, what is displayed? Explain your answer briefly.

```
class See
{
   public static int x = 10;
   //---------------------------------
   public See()
   {
     x++;
   }
}
//================================================
class TestSee
{
   public static void main(String[] args)
   {
      See z = new See();
      for (int i = 1; i <= 100; i++)
         z = new See();
      System.out.println(z.x);
   }
}
```

output is 111

b) Write a copy constructor for the class below. Be as efficient as possible. Hint: `Integer` is an immutable class.

```
import java.util.Random;
class Saw
{
  private int x;
  private Integer p;
  //---------------------------------
  public Saw()
  {
    Random r = new Random();
    x = r.nextInt();
    p = new Integer(r.nextInt());
 }
 public Saw(Saw original)
 {
    x = original.x;
    p = original.p;
 }
}
```