COSC 117 **Exam 1** Fall 2012

Name: _____

Part 1: Definitions & Short Answer (3 Points Each)

1. What does CPU stand for?

2. Explain the difference between high-level languages and machine language.

3. What is the difference between a compiler and an interpreter?

4. Java is a "platform-independent language." What does this mean?

5. What is a block statement?

6. What are the three types of programming errors? Briefly describe each of them.

7. What do each of the following do, &&, | |, !, and ^?

Part 2: Program Traces (15 Points Each)

1. For each of the program inputs below write the output of the program.

```
import java.util.Scanner;

public class Exam1Trace1 {
   public static void main(String[] args) {
       Scanner keyboard = new Scanner(System.in);
       System.out.print("Input w: ");
       double w = keyboard.nextDouble();
       System.out.print("Input x: ");
       double x = keyboard.nextDouble();
       System.out.print("Input y: ");
       int y = keyboard.nextInt();

       double z = x/4-y/2;
       w += z;
       int m = (int)z;
       int n = (y++) * (--m);

       System.out.println(x + " " + y + " " + z + " " + w + " " + m + " " + n);
   }
}
```

(a)

```
Input w: 5
Input x: 7
Input y: 9
```

(b)

```
Input w: 21
Input x: 25
Input y: 15
```

(c)

```
Input w: -3
Input x: -2
Input y: 8
```

2. For each of the program inputs below write the output of the program.

```
import java.util.Scanner;

public class Exam1Trace2 {
   public static void main(String[] args) {
       Scanner keyboard = new Scanner(System.in);
       System.out.print("Input x: ");
       int x = keyboard.nextInt();
       System.out.print("Input y: ");
       int y = keyboard.nextInt();

       if (x-y > 0){
          System.out.println("Part 1: (x-y > 0)");
       } else if (x-y < -10){
          System.out.println("Part 2: (x-y < -10)");
       } else if (2*x != 4*y){
          System.out.println("Part 3: (2*x != 4*y)");
       } else if (x*x+y*y <= 16){
          System.out.println("Part 4: (x*x+y*y < 16)");
       } else {
          System.out.println("None of the above. ");
       }
   }
}
```

(a)

```
Input x: 5
Input y: 6
```

(b)

```
Input x: 0
Input y: 0
```

(c)

```
Input x: 10
Input y: 5
```

(d)

```
Input x: 5
Input y: 25
```

3. For each of the program inputs below write the output of the program.

```
import java.util.Scanner;

public class Exam1Trace3 {
   public static void main(String[] args) {
      Scanner keyboard = new Scanner(System.in);
      System.out.print("Input n: ");
      int n = keyboard.nextInt();

      while (n > 0){
         if (n % 5 == 0){
            n = n/5;
         } else if (n % 3 == 0){
            n = n/3;
         } else if (n % 2 == 0){
            n = n/2;
         } else {
            n--;
         }
         System.out.print(n + " ");
      }
   }
}
```

(a)

```
Input n: 33
```

(b)

```
Input n: 77
```

(c)

```
Input n: 500
```

Part 3: Coding (15 Points Each)

1. Write a program that will take in three integers and output them in order from smallest to largest. A sample run of the program will produce the following output.

```
Input three integers: 2 3 1
Sorted: 1  2  3
```

```
import java.util.Scanner;

public class Exam1Code1 {
   public static void main(String[] args) {
       Scanner keyboard = new Scanner(System.in);
       System.out.print("Input three integers: ");
       int num1 = keyboard.nextInt();
       int num2 = keyboard.nextInt();
       int num3 = keyboard.nextInt();









   }
}
```

2. Write a program that will simulate rolling two die and count the number rolls it takes to get two consecutive rolls of snake-eyes. A sample run is below.

```
Number of rolls = 862
```

```
public class Exam1Code2 {
   public static void main(String[] args) {









   }
}
```

3. Write a program that will take an input a String and count the number of uppercase characters, lowercase characters and output these counts along with a count of the number of other characters. A sample run is below.

```
Input the String: This Is A TesT of the CHARacter COunts
Uppercase = 11
Lowercase = 20
Other = 7
```

```
import java.util.Scanner;

public class Exam1Code3 {
   public static void main(String[] args) {
       Scanner keyboard = new Scanner(System.in);
       System.out.print("Input the String: ");
       String str = keyboard.nextLine();









   }
}
```