Sample Exam 1

Answer each question in the space provided. Point values are listed next to question numbers.

1. Short answer
   a. What are the two basic types of calculations computers can perform?

   b. What does a compiler do?

   c. Give an example of a high-level programming language.

   d. Describe the relationship between a class and an object.

   e. What is an argument?

2. Place the following program components in the correct order in a Java program, and give an example of each type of statement:

   _____ import statement

   _____ heading for main method

   _____ variable declaration for x, which will store a whole number

   _____ output statement showing value of x

   _____ heading for class

   _____ statement assigning a random number to x

   _____ statement declaring and initializing a Random object

   _____ end bracket for class

   _____ end bracket for main method
3. Give the **result value** and **data type** (will be int or double) of each expression below:
   a. \((17.2 - 7) \times .1\)
   
   b. Math.pow(10, 3.0)
   
   c. \(5 \% 10 \times 8 + 9 - 6 / 2\)
   
   d. (int)14.9 / (double) 2
   
   e. Math.abs(17 - 24)

4. Examine each line of code in the program below. If the line contains an error, correct it in the space provided; if the line contains no error, write OK in the space provided:

<table>
<thead>
<tr>
<th>Source code</th>
<th>Corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td>public class Exam1</td>
<td></td>
</tr>
<tr>
<td>public statistic void main (String[] args) {</td>
<td></td>
</tr>
<tr>
<td>int my number;</td>
<td></td>
</tr>
<tr>
<td>int yourNumber</td>
<td></td>
</tr>
<tr>
<td>4 + 5 = yourNumber;</td>
<td></td>
</tr>
<tr>
<td>System.out.println (I have a number);</td>
<td></td>
</tr>
<tr>
<td>System.OUT.println (&quot;You have one too&quot;);</td>
<td></td>
</tr>
<tr>
<td>System.out.println (&quot;And roses are red&quot;);</td>
<td></td>
</tr>
<tr>
<td>System.out.println (&quot;And violets are blue&quot;);</td>
<td></td>
</tr>
<tr>
<td>Goodbye!</td>
<td></td>
</tr>
<tr>
<td>{}</td>
<td></td>
</tr>
<tr>
<td>}</td>
<td></td>
</tr>
<tr>
<td>// I said goodbye already. What are you looking at?</td>
<td></td>
</tr>
</tbody>
</table>
5. Show the output from the following program in the space provided.

```java
import java.text.*;

class P1 {
    public static void main(String[] args) {
        final String TEST = "This is a test";
        double dValue = 9.70916;
        String exam;
        System.out.println(TEST);
        exam = TEST.substring(0, 7);
        System.out.print(exam);
        System.out.print(" only ");
        System.out.println(TEST.substring(8, TEST.length()));
        System.out.println("Your lucky number is " + (int)dValue);
    }
}
```
6. Write a program that computes the amount of money in a bank account after N years using the following formula:

\[ P (1 + R)^N \]

where P represents the initial principle, R is the percent interest rate compounded annually and N is the number of years of compounding. Your program should:

- generate random numbers:
  - P should be a multiple of 10 between 500 and 10000
  - R should be number between .01 and .1
  - N should be a number between 5 and 20
- output the values of P, R and N labeled appropriately
- perform the calculation
- output the result

Sample run of program:
initial principle = 1000
interest rate = .04
years of compounding = 5
The end result is 1216.652902400001