Sample Exam 1

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

1. Using the class declaration below, determine what is wrong with each of the marked lines (a-e) in the program that follows, and correct the errors:

```java
public class Exam {
    public static int method1(int x, String s) { return 0; }
    public void method2(String s, int x) {}
}

public class Test {
    public static void main (String [] args) {
        Exam e = new Exam();
        e.method1(4, “test”); // a
        String str = Exam.method1(4, “test”); // b
        e.method2(4, “test”); // c
        int y = Exam.method1(4, “test”); // d
        e.method2(“test”,4) = Exam.method1(4, “test”); // e
    }
}
```

Corrections:

2. Give the result value and data type (will be int or double) of each expression below:
   a. (17.2 – 7) * .1

   b. Math.pow(10, 3.0)

   c. 5 % 10 * 8 + 9 – 6 / 2

   d. (int)14.9 / (double) 2

   e. Math.abs(17 - 24)
3. 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

4. Show the exact output of the program shown using the grid below:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
```

```
public class PrintEx {
    public static void main(String[] args) {
        final double magic = 9.568;
        final double whoopee = .0014;
        System.out.printf("%10.2f%10.2f\n", magic, whoopee);
        System.out.printf("%10.1f%10.1f\n", whoopee, magic);
        System.out.printf("%10.6f%10.6f\n", magic, whoopee);
        System.out.printf("%5.1f\n%10.3f%10.3f%10s\n", magic, whoopee, "Whee!");
        System.out.printf("%3.9f\n", magic);
    }
}
```
5. 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 static 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>
</tbody>
</table>
// I said goodbye already. What are you looking at?                         |             |

6. Draw the picture created by the paint() method shown below. Assume it will appear in a 300x300 window:

```java
public void paint(Graphics g) {
    g.setColor(Color.black);
    g.fillRect(0,0,10,300);
    g.fillRect(290,0,10,300);
    g.setColor(Color.blue);
    g.fillOval(30,30,240,240);
    g.setColor(Color.pink);
    g.fillArc(50,50,120,120,90,-90);
    g.fillArc(50,50,120,120,180,90);
    g.setColor(Color.magenta);
    g.fillArc(130,130,120,120,90,-90);
    g.fillArc(130,130,120,120,180,90);
}
```
7. 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 a 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