1. (50 pts) Evaluate each of the following Boolean expressions. If an expression cannot be evaluated, you may simply write “error”. The variables x, y, and z are initialized below.

```java
int x = 15, y = -15, z = 6;
char a = ‘a’, b = ‘b’;
boolean f = false;
```

<table>
<thead>
<tr>
<th>Boolean Expression</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>x &lt; y</td>
<td></td>
</tr>
<tr>
<td>(x &gt; y)</td>
<td></td>
</tr>
<tr>
<td>(x &gt; y) &amp;&amp; (z &lt; y)</td>
<td></td>
</tr>
<tr>
<td>x &gt; z &gt; y</td>
<td></td>
</tr>
<tr>
<td>x + y &lt; z</td>
<td></td>
</tr>
<tr>
<td>!(x &gt; z)</td>
<td></td>
</tr>
<tr>
<td>(z &lt; y) &amp;&amp; !(z &gt; 0)</td>
<td></td>
</tr>
<tr>
<td>(x &gt; z) &amp;&amp; !f</td>
<td></td>
</tr>
<tr>
<td>(a &lt; b)</td>
<td></td>
</tr>
<tr>
<td>a + 1 == b</td>
<td></td>
</tr>
</tbody>
</table>

2. (20 pts) Consider the following snippet of code:

```java
// i defined and initialized here
int c = 0;
if (i > 100) {
    c = 1;
} else if (i >= 50) {
    c = 2;
} else if (i > 0) {
    c = 3;
} else {
    c = 4;
}
System.out.println(c);
```

<table>
<thead>
<tr>
<th>Initial value of i</th>
<th>Program output</th>
</tr>
</thead>
<tbody>
<tr>
<td>int i = 10;</td>
<td></td>
</tr>
<tr>
<td>int i = 50;</td>
<td></td>
</tr>
<tr>
<td>int i = 100;</td>
<td></td>
</tr>
<tr>
<td>int i = -100;</td>
<td></td>
</tr>
</tbody>
</table>
3. (30 pts) For each piece of code below, give the output (that is, what will be displayed on the screen) of the code. If there is no output generated, you may write "none". The code segments are independent (that is, they do not effect each other).

(a)
```
int a = 7;
if (a % 3 == 0)
    if (a < 10)
        System.out.println("Hello");
else
    System.out.println("World");
```

(b)
```
int x = 12;
if (x > 10) {
    System.out.println("Java");
    if (x > 20) {
        System.out.println("C++");
    }
    else {
        System.out.println("Python");
    }
}
```

(c)
```
int a = 2004;
if ((a % 4 == 0) && !(a % 100 == 0) || (a % 400 == 0))
{
    System.out.println("Emory");
}