Name (print): __________________________________________________

**INSTRUCTIONS:**

- Keep your eyes on your own paper and do your best to prevent anyone else from seeing your work.
- Do NOT communicate with anyone other than the professor/proctor for ANY reason in ANY language in ANY manner.
- This exam is not open notes, open books, and no calculator, no electronics.
- Turn all mobile devices OFF and put them away now. You cannot have them on your desk.
- Write neatly and clearly indicate your answers. If I cannot read your answer, I will assume to be incorrect.
- Stop writing when told to do so at the end of the exam. I will take 10 points OFF if you keep writing after I told you to stop.
- Academic misconduct will not be tolerated. Suspected academic misconduct will be immediately referred to the Emory Honor Council. Penalties for misconduct will be a zero on this exam, an F grade in the course, and/or other disciplinary action that may be applied by the Emory Honor Council.

**TIME:** This exam has 5 questions on 9 pages including the title page. Page 10 is left blank and you can use it if you need more space to answer to any problem; make sure you include the number of the problem. Please check to make sure all pages are included. You will have a total of 60 minutes to complete the exam. Good luck!

I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Emory community. I have also read and understand the requirements and policies outlined above.

Signature: __________________________________________________

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points:</td>
<td>15</td>
<td>20</td>
<td>30</td>
<td>20</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>Score:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. (15 points) Answer the following questions. Be concise and limit your response to 50 words.
   a. (1 point) What is a variable?
   
   b. (2 points) Give the names of 4 primitive data types available in Java.
   
   c. (2 points) Explain the usage of keywords break and continue.
   
   d. (3 points) Write down the appropriate answers to the following UNIX commands:
      
      Change the current directory to subdirectory subDIR/    _____cd subDIR/_______________
      Go to parent directory                                  _____cd ..____________________
      List the content of current directory                   ___________ls_________________
e. (7 points) For each row of the table, state whether the expression is correct or has an error. If there is no error, give the type and result of the expression. If there is error, leave the type and result as blank. The first row has been completed for you.

```java
int a = 10, b = 2;
double c = 2.0, d = 3;
char e = 'a', f = 'b';
String g = "123";
```

<table>
<thead>
<tr>
<th>Expression</th>
<th>Error?</th>
<th>Type (if no error)</th>
<th>Result (if no error)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a + b</td>
<td>no</td>
<td>int</td>
<td>12</td>
</tr>
<tr>
<td>(char)a + b</td>
<td>no</td>
<td>int</td>
<td>12</td>
</tr>
<tr>
<td>a &gt; d</td>
<td>no</td>
<td>boolean</td>
<td>true</td>
</tr>
<tr>
<td>g + a * b</td>
<td>no</td>
<td>String</td>
<td>&quot;12320&quot;</td>
</tr>
<tr>
<td>g + f - e</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(int) d/c</td>
<td>no</td>
<td>double</td>
<td>1.5</td>
</tr>
<tr>
<td>e &gt; a &amp;&amp; f - e == 1</td>
<td>no</td>
<td>boolean</td>
<td>true</td>
</tr>
<tr>
<td>b &lt; a &lt;= 20</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1pt each row

2. (20 points) Assume the statements below are part of a Java program which compiles and runs.

a. (14 points) What is the output if the user types 25?

```java
Scanner in = new Scanner(System.in);
int num = in.nextInt();

if (num > 10) {
    System.out.println("one"); //one
} else if (num > 20) {
    System.out.println("two");
} else if (num > 40) {
    System.out.println("three");
} else {
    System.out.println("four");
}

System.out.println("rose"); //rose
if (num > 40) {
    System.out.println("one");
} else if (num > 20) {
```
```java
System.out.println("two");  //two
} else if (num > 10) {
    System.out.println("three");
} else {
    System.out.println("four");
}

System.out.println("tulip");    //tulip
if (num > 10) {
    System.out.println("one");    //one
}
if (num > 20) {
    System.out.println("two");    //two
}
if (num > 40) {
    System.out.println("three");
} else {
    System.out.println("four");    //four
}

one rose two tulip one two four

2 pts each word

b. (6 points) What does the program output if theDay variable has the following values? Answer for each case separately in the following table.

<table>
<thead>
<tr>
<th>theDay</th>
<th>output</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEDNESDAY 2 pts</td>
<td>Working for the man :)</td>
</tr>
<tr>
<td>SATURDAY 2 pts</td>
<td>Ahh, the weekend ...</td>
</tr>
<tr>
<td></td>
<td>Ahh, the weekend ...</td>
</tr>
<tr>
<td>SOMEDAY 2pts</td>
<td>What day is it?</td>
</tr>
</tbody>
</table>

final int MONDAY = 1;
final int TUESDAY = 2;
final int WEDNESDAY = 3;
final int THURSDAY = 4;
final int FRIDAY = 5;
final int SATURDAY = 6;
final int SUNDAY = 7;
final int SOMEDAY = 10;

switch (theDay)
{
    case MONDAY:
    case TUESDAY:
    case WEDNESDAY:
    case THURSDAY:
        System.out.println("Working for the man :) ");
        break;
    case FRIDAY:
        System.out.println("Weekend is coming... ");
    case SATURDAY:
        System.out.println("Ahh, the weekend ...");
    case SUNDAY:
        System.out.println("Ahh, the weekend ...");
        break;
    default:
        System.out.println("What day is it?");
}

3. (30 points) ) Write down the output of each of the code below. For a syntactic error, if any, write “syntax error” and briefly explain it on the provided code. For infinite loop, write infinite loop and briefly explain why.

a) (5 points) Infinite loop – doesn’t reach 0

int x = 25;
while(x != 0){
    System.out.println("x = “ + x);
    x -= 8;
}
System.out.println("And now the loop has ended.");

b) (5 points) Infinite loop – x doesn’t change

int x = 25;
while(x != 0)
    System.out.println("x = “ + x);
    x -= 10;
System.out.println("And now the loop has ended.");
c) (5 points)

```java
int x = 25;
while(x != 0){
    System.out.println("x = "+ x);
    x -= 5;
    if (x == 15)
        break;
}
System.out.println("And now the loop has ended.");
```

```
6
X = 25
X = 20
```

```
5
```
4. (20 points) The web is built with HTML strings like "<i>Yay</i>" which draws Yay as italic text. In this example, the "i" tag makes <i> and </i> which surround the word "Yay". Given tag and word strings, create a method (function) that takes tag and word as input parameters and returns the HTML string with tags around the word, e.g. "<i>Yay</i>". Then, invoke this function with the tag "<i>" and word “Yay”, and then, with the tag “<b>” and word “Java”.

//accept any method that is correct, but keep requirements

6   public static String taggy(String tag, String word){
5      String newStr = "<" + tag + ">" + word + "</" + tag + ">";  //accept any correct form
3      return newStr;
    }
3      String st = taggy("i","Yay");
3      String str = taggy("b","Java");

5. (15 points) Write code that prints out a multiplication table starting from 1 up to a number given by user. Assume that the number is a multiple of 10 (no need to check it!). Assume that between numbers there are 3 spaces. Print 10 numbers per each row as in the following example, where number is 20:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
</tr>
</tbody>
</table>
public class MultiplicationTable {
    public static void main(String[] args) {

        Scanner in = new Scanner(System.in);
        int num = in.nextInt();

        //display the number title
        System.out.print(" | ");
        for (int j = 1; j <= 10; j++)
            System.out.print(" + j");

        //display the table
        int k = n / 10;
        for (int i = 1; i <= k; i++)
            System.out.println(i + " | ");
        for (int j = 1; j <= 10; j++)
            System.out.printf("%4d", i*j);

        System.out.println();
    }
}