CS 1323-020: Introduction to Computer Programming
Exam 1
September 15, 2014

General instructions:

- Please wait to open this exam booklet until you are told to do so.

- This examination booklet has 13 pages. You also have been issued a bubble sheet.

- Write your name, university ID number and date, and sign your name below. Also, write your name and ID number on your bubble sheet, and fill in the bubbles for your ID.

- The exam is open book and open notes, but is closed electronic device. The only exception is that you may use an electronic device to display a PDF copy of the book (all communication must be turned off and no other applications may be used).

- The exam is worth a total of 100 points (and 10% of your final grade).

- You have 1.25 hours to complete the exam. Be a smart test taker: if you get stuck on one problem go on to the next.

- Use your bubble sheet to answer all multiple-choice questions. Make sure that the question number and the bubble row number match when you are answering each question. Use the provided space in this exam booklet to answer the coding questions.

On my honor, I affirm that I have neither given nor received inappropriate aid in the completion of this exam.

Signature: _____

Name: _____

ID Number: _____

Date: _____

Question	Points	Score
Variables, Types and Conversions	14	
Mathematical Operations	18	
Conditionals	18	
Loops	20	
Coding	30	
Total:	100	

B

Part I. Variables, Types and Conversions

1. (2 points) Given the following block of code. Which line contains an error?

```
1  int aa = 5;
2  int bc = 99;
3  int c1 = 32;
4  int d_ = 7;
```

   A. Line 1   B. Line 2   C. Line 3   D. Line 4   **E. There are no errors**

2. (2 points) Given the following block of code. Which line contains an error?

```
1  int m = 5;
2  double n = 99;
3  double o = m;
4  int p = n;
```

   A. Line 1   B. Line 2   C. Line 3   **D. Line 4**   E. There are no errors

3. (2 points) What type of data would you use to measure the forward progress of the baby during a fixed period of time (in meters)?

   A. int   B. boolean   **C. double**   D. String   E. Answer not shown

4. (2 points) Given the following block of code. Which line contains an error?

```
1  int a = 5;
2  double b = 99;
3  int c@ = 7;
4  boolean d = false;
```

   A. Line 1   B. Line 2   **C. Line 3**   D. Line 4   E. There are no errors

5. (2 points) What type of data would you use to store the name of the baby?

   A. int   B. boolean   C. double   **D. String**   E. Answer not shown

6. (2 points) Given the following block of code. Which line contains an error?

```
1  int foo = 5;
2  int bar = 42;
3  int foo = 3;
4  int baz = 1138;
```

   A. Line 1   B. Line 2   **C. Line 3**   D. Line 4   E. There are no errors

7. (2 points) What type of data would you use to count the number of times that a baby pushed herself to the left [using the assistive robot]?

   A. int   B. boolean   C. double   D. String   E. Answer not shown

Part II. Mathematical Operations

8. (2 points) What result is printed by this block of code? Answers within a small delta from the true answer are considered true.

```
double a = 36.3;
int b = 93;
b = (int) a;
System.out.println("The result is: " + b / 3);
```

A. 12   B. 12.1   C. 31   D. There is an error   E. Answer not shown

9. (2 points) What result is printed by this block of code? Answers within a small delta from the true answer are considered true.

```
double a = 9.0
int b = 4;
int c = a/b;
System.out.println("The result is: " + (c + 1));
```

A. 2   B. 3   C. 3.25   **D. There is an error**   E. Answer not shown

10. (2 points) What result is printed by this block of code? Answers within a small delta from the true answer are considered true.

```
int i = 23;
int j = 7;
int k = i % j;
System.out.println("The result is: " + k);
```

A. 0   **B. 2**   C. 7   D. There is an error   E. Answer not shown

11. (2 points) What result is printed by this block of code? Answers within a small delta from the true answer are considered true.

```
int h = 7;
double i = 2.5;
double c = h/i;
System.out.println("The result is: " + (c + 1));
```

A. 2   B. 2.8   **C. 3.8**   D. There is an error   E. Answer not shown

12. (2 points) What result is printed by this block of code? Answers within a small delta from the true answer are considered true.

```
int r = 9;
double s = 3.2;
double t = 4.0;
double u = s + r / t;
System.out.println("The result is: " + u);
```

A. 5   B. 5.2   **C. 5.45**   D. There is an error   E. Answer not shown

13. (2 points) What result is printed by this block of code?

```
int foo = 42;
int bar = 1138;
bar = bar * 2;
int baz = 3;
bar = baz + foo;
System.out.println("The result is: " + bar);
```

A. 42   **B. 45**   C. 1138   D. 2276   E. Answer not shown

14. (2 points) What result is printed by this block of code? Answers within a small delta from the true answer are considered true.

```
int m = 29;
int n = 3;
double p = 2.7;
double q = p + m / n;
System.out.println("The result is: " + q);
```

A. 11   B. 12.36666   C. 12.7   D. There is an error   **E. Answer not shown**

15. (2 points) What result is printed by this block of code? Answers within a small delta from the true answer are considered true.

```
int foo = 8;
double bar = 11;
bar = foo;
System.out.println("The result is: " + bar / 3);
```

A. 2   **B. 2.666666666**   C. 3   D. 3.333333333   E. Answer not shown

16. (2 points) What result is printed by this block of code? Answers within a small delta from the true answer are considered true.

```
int a = 42;
int b = 10;
double k = a % b + 1;
System.out.println("The result is: " + k);
```

A. 1   B. 2   **C. 3**   D. There is an error   E. Answer not shown

Part III. Conditionals

17. (3 points) What result is printed by this block of code?

```
int n = 21;
if (n > 16)
{
   if (n > 32)
     System.out.println (n + 5);
   else
     System.out.println (n / 3);
}
else
{
   if (n < -10)
     System.out.println (a * 2);
   else
     System.out.println (a - 3);
}
```

A. 7   B. 18   C. 26   **D. There is an error**   E. Answer not shown

18. (3 points) What result is printed by this block of code?

```
int price = 1138;

if (price >= 1000)
{
   price += price / 10;
}
else if (price >= 100)
{
   price += price / 20;
}
else
{
   price += price / 100;
}

System.out.println (price);
```

A. 1149   B. 1194   **C. 1251**   D. There is an error   E. Answer not shown

19. (3 points) What result is printed by this block of code?

```java
char c = 'm';

if(c < 'p')
{
   if(c > 'a')
     System.out.println('A');
   else
     System.out.println('B');
}
else
{
   if(c != 'k')
     System.out.println('C');
   else
     System.out.println('D');
}
```

A. A   B. B   C. C   D. D   E. There is an error

20. (3 points) What result is printed by this block of code?

```java
int a = 43;
if(a > 67)
{
    System.out.println(a - 2);
}
else
{
    System.out.println(a/2);
}
```

A. 21   B. 21.5   C. 41   D. There is an error   E. Answer not shown

21. (3 points) What result is printed by this block of code?

```java
int k = 6;
boolean flag = ((k % 2) == 1);

if(flag)
{
   if(k == 7)
     System.out.println(k);
   else
     System.out.println(k * 3);
}
else
{
   if(k < -2)
     System.out.println(k - 5);
}
```

A. 1   B. 6   C. 18   D. There is an error   **E. Answer not shown**

22. (3 points) What result is printed by this block of code?

```java
double val = 16.0;

if(val < 10.0)
{
   if(val < 17.0 )
     System.out.println('A');
   else
     System.out.println('B');
}
else
{
   if(val <= 2.0)
     System.out.println('C');
   else
     System.out.println('D');
}
```

A. A   B. B   C. C   **D. D**   E. There is an error

Part IV. Loops

23. (4 points) What result is printed by this block of code?

```
int m = 0;
int n = 0;

while (m < 10)
{
    n += m;
    m += 15;
}
System.out.println("The result is: " + n);
```

A. 0   B. 15   C. 45   D. Loop does not terminate (end)   E. Answer not shown

24. (4 points) What result is printed by this block of code?

```
int a = 0;
int b = 13;

while (a < b)
{
    ++a;
    b -= 1;
}
System.out.println("The result is: " + b);
```

A. 6   B. 7   C. 8   D. Loop does not terminate (end)   E. Answer not shown

25. (4 points) What result is printed by this block of code?

```
char c = 'a';
int count = 0;

while (c < 'g')
{
    ++c;
    ++count;
}
System.out.println("The result is: " + count);
```

A. 0   **B. 6**   C. 7   D. Loop does not terminate (end)   E. Answer not shown

26. (4 points) What result is printed by this block of code?

```
int a = 7;
int b = 0;
while (a < 10)
{
   a = a / 14 + 1;
   b += a;
}
System.out.println("The result is: " + b);
```

A. 0   B. 6   C. 24   **D. Loop does not terminate (end)**   E. Answer not shown

27. (4 points) What result is printed by this block of code?

```
int a = 33;
int b = 0;
while (a > 0)
{
   a /= 2;
   b += a;
}
System.out.println("The result is: " + b);
```

A. 16   **B. 31**   C. 32   D. Loop does not terminate (end)
E. Answer not shown

Part V. Coding

28. (15 points) Write a **code fragment** in the space below that prints the maximum value contained in three variables (a, b and c). You may assume that these variables, all doubles, are already declared and assigned to some set of values and that all of the values are different. Do not use the && or the || operators.

Solution:

```
if (a > b)
{
  if (a > c)
    System.out.println(a);
  else
    System.out.println(c);
}
else
{
  if (b > c)
    System.out.println(b);
  else
    System.out.println(c);
}
```

29. (15 points) Write a **code fragment** in the space below that generates the following table for converting meters to feet. Note that there are 3.28084 feet in one meter. In your solution, do not worry about the "pretty" formatting of the table (a space between column entries is sufficient). You must employ at most one variable and at least one constant in your solution. You must use a loop.

```
Feet       Meters
10         3.0484087306426044
15         4.572613095963907
20         6.096817461285209
25         7.621021826606511
30         9.145226191927813
35         10.669430557249115
40         12.193634922570418
45         13.717839287891719
50         15.242043653213022
```

Solution:

```java
int feet = 10;
final double metersToFeet = 3.2804;
final int maxFeet = 50;
final int feetIncrement = 5;

System.out.println("Feet\tMeters");

while(feet <= maxFeet){
    System.out.println( feet + "\t" + feet / metersToFeet);
    feet += feetIncrement;
}
```