ICS 3U1 – Practice Test
Loops

Name: _____

1. What three parts of a counting loop must be coordinated in order for it to work properly?

   a) initializing the counter, testing the counter, changing the counter
   b) initializing the condition, changing the condition, terminating the loop
   c) the while, the assignment, and the loop body
   d) the while statement, the if statement, and sequential execution
   e) the do, the while, and the loop body

2. If r is declared as a value of type double, then the statements:

```
double r = 30.0;
while (r >= 40.0)
{
  System.out.println("hello");
  r = r - 10.0;
}
```

   will print:

   a) nothing will be printed
   b) `hello`
   c) `hello`
      `hello`
      `hello`
   d) an infinite loop of hello will result
   e) an error message because there is an illegal statement

3. Examine the following code:

```
int count =  1;
while (  ____________ )
{
  System.out.print( count + " " );
  count = count + 1;
}
```

   What condition should be used so that the code writes out:
   1 2 3 4 5 6 7 8

   a) `count < 8`
   b) `count < 9`
   c) `count + 1 <= 8`
   d) `count != 8`
   e) none of the above

4. What will the following loop print when part of a complete program?

```
int i = 12;
do
{
    i = i + 1;
    System.out.print (i + " ");
}
while (i > 12);
```

   a) `12`
   b) `13`
   c) `12 13`
   d) Nothing will be printed.
   e) An infinite loop will result, outputting `13 14 15 16 17 18 19 20 21 22...`

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5. T F Meaningful variable names and indentation makes for easier debugging of your program.

6. T F FOR loops are used when you don't know how many times to repeat.

7. Explain the purpose of the `while` statement in Java. [K 2]

8. Explain the purpose of the `for` statement in Java. [K 2]

9. Rewrite each of the following `while` loops a using a for loop [A 3]

a)

```
int x=0, y=1;
while (x < 3)
{
    System.out.println(x + y);
    x = x + 1;
    y = y + 1;
}
```

b) [A 3]

```
int rabbits = 3;
while (rabbits < 100)
{
    System.out.println(rabbits);
    rabbits = rabbits * 3;
}
```

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10. State, with reasons, which loop structure you think would be **most appropriate** for solving each problem. You do not have to actually solve the problem

[K 5]

a) Find the sum of the cubes of the numbers from 1 to 100
b) Repeatedly prompt the user for a password, rejecting any submissions until the correct password has been provided.
c) Read and sum positive integers until a sentinel value of -1 has been read.
d) Determine the number of times that a positive integer can be divided by two.
e) Find the amount to which $1 will grow in ten years at an interest rate of 8%.

	while, do-while, for	Reason
a)		
b)		
c)		
d)		
e)		

11. Make a program that accepts user input of positive numbers. The user enters the numbers one at time and the program stops when the number entered is less than zero. It then displays the number of times a number larger than 10 was entered. Assume the skeleton code is given. No comments are required.

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12. Display all the multiples of <mult> between <x> and <y> (inclusive) across the screen with a few spaces in-between them. You will have to input 3 integers: the multiple, x and y. Prompt for the <mult>, the <x> and <y>
Example 1: if entered a multiple of 5 between 2 and 24 the following would get output:
2 7 12 17 22

Example 2: if entered a multiple of 7 between 3 and 30 the following would get output:
3 10 17 24

12. Create a password program in Java. Ask for the password (which is **`my password`**) Note the SPACE between `my` and `password`. The user has FIVE attempts at the password. After each unsuccessful attempt, display "invalid password". After the password is entered correctly, display "access granted" and stop the program. After 5 unsuccessful attempts, display "too many invalid attempts" and stop the program. Comments are not required.