Chapter 3 Review Problems Name: _____

1. Consider the following code segment.

```
for (int k = 0; k < 20; k = k + 2) {
   if (k % 3 == 1)
      System.out.print(k + " " );
}
```

What is printed as a result of executing the code segment?

a) 4 16
b) 4 10 16
c) 0 6 12 18
d) 1 4 7 10 13 16 19
e) 0 2 4 6 8 10 12 14 16 18

2. Consider the following code segment.

```
int num1 = 0;
int num2 = 3;

while ((num2 != 0) && ((num1 / num2) >= 0)) {
    num1 = num1 + 2;
    num2 = num2 - 1;
}
```

What are the values of `num1` and `num2` after the while loop completes its execution?

a) `num1 = 0, num2 = 3`
b) `num1 = 8, num2 = -1`
c) `num1 = 4, num2 = 1`
d) `num1 = 6, num2 = 0`
e) The loop will never complete its execution because a division by zero will generate an `ArithmeticException`.

3. Assume that a, b, and c are variables of type int. Consider the following three conditions.

I. `(a == b) && (a == c) && (b == c)`
II. `(a == b) || (a == c) || (b == c)`
III. `((a - b) * (a - c) * (b – c)) == 0`

Assume that subtraction and multiplication never overflow. Which of the conditions above is (are) always true if at least two of a, b, and c are equal?

a) I only
b) II only
c) III only
d) I and II
e) II and III

4. Consider the following code segment.

```
int sum = 200;
int n = 0;
if ((n != 0) && (sum / n > 90))
    return sum += sum;
else
    return sum;
```

What is the result when this code is executed?

a) A run-time error occurs when evaluating `sum / n`.
b) A compile-time error occurs when evaluating `sum / n`.
c) `0` is returned.
d) `200` is returned.
e) `400` is returned.

5. Consider the following method.

```
public void conditionalTest(int a, int b) {
     if ((a > 0) && (b > 0)) {
          if (a > b)
               System.out.println("A");
          else
               System.out.println("B");
     }
     else if ((b < 0) || (a < 0))
          System.out.println("C");
     else
          System.out.println("D");
}
```

What is printed as a result of the call `conditionalTest(3, -2)` ?

a) A
b) B
c) C
d) D
e) Nothing is printed.

Chapter 3 Review Problems Name: _____

6. Consider the following output.

```
1   1   1   1   1
2   2   2   2
3   3   3
4   4
5
```

Which of the following code segments will produce this output?

a)

```
for (int j = 1; j <= 5; j++) {
     for (int k = 1; k <= 5; k++) {
          System.out.print(j + " ");
     }
     System.out.println();
}
```

b)

```
for (int j = 1; j <= 5; j++) {
     for (int k = 1; k <= j; k++) {
          System.out.print(j + " ");
     }
     System.out.println();
}
```

c)

```
for (int j = 1; j <= 5; j++) {
     for (int k = 5; k >= 1; k--) {
          System.out.print(j + " ");
     }
     System.out.println();
}
```

d)

```
for (int j = 1; j <= 5; j++) {
     for (int k = 5; k >= j; k--) {
          System.out.print(j + " ");
     }
     System.out.println();
}
```

e)

```
for (int j = 1; j <= 5; j++) {
     for (int k = j; k <= 5; k++) {
          System.out.print(k + " ");
     }
     System.out.println();
}
```

7. At a certain high school students receive letter grades based on the following scale.

Numeric Score	Letter Grade
93 or above	A
From 84 to 92 inclusive	B
From 75 to 83 inclusive	C
Below 75	F

Which of the following code segments will assign the correct string to `grade` for a given integer `score`?

I.

```
if (score >= 93)
     grade = "A";
if (score >= 84 && score <= 92)
     grade = "B";
if (score >= 75 && score <= 83)
     grade = "C";
if (score < 75)
     grade = "F";
```

II.

```
if (score >= 93)
     grade = "A";
if (84 <= score <= 92)
     grade = "B";
if (75 <= score <= 83)
     grade = "C";
if (score < 75)
     grade = "F";
```

III.

```
if (score >= 93)
     grade = "A";
else if (score >= 84)
     grade = "B";
else if (score >= 75)
     grade = "C";
else
     grade = "F";
```

a) II only
b) III only
c) I and II only
d) I and III only
e) I, II, and III

8. Consider the following code segment. The code is intended to read nonnegative numbers and compute their product until a negative number is read; however, it does not work as intended.

```
int k = 0;
int prod = 1;

while (k >= 0) {
    System.out.print("enter a number: ");
    k = Keyboard.readInt();
    prod = prod * k;
}

System.out.println("product: " + prod);
```

Which of the following best describes the error in the program?

a) The variable `prod` is incorrectly initialized.
b) The while condition always evaluates to `false`.
c) The while condition always evaluates to `true`.
d) The negative number entered to signal no more input is included in the product.
e) If the user enters a zero, the computation of the product will be terminated prematurely.

9. Consider the following code segment.

```
x = 6;
y = 19;
z = 2;
if (x > y)
    if (z > x)
        z++;
else
    z -= 5;
y += x;
```

After this code is executed, the values of x, y, and z are:

a) `x = 6, y = 25, z = -3`
b) `x = 6, y = 19, z = 2`
c) `x = 6, y = 25, z = 3`
d) `x = 6, y = 25, z = 2`
e) `x = 6, y = 19, z = 3`

10. Given the following declarations:

```
String vowel = "aeiou";
String word = some String value;
int count = 0;
```

Which of the following segments of code accurately counts the number of letters in word that are vowels (a, e, i, o, or u)?

I.

```
for (int j = 0; j < vowel.length(); j++) {
    String temp = vowel.substring(j, j + 1);
    if (word.indexOf(temp) != -1) {
        count++;
    }
}
```

II.

```
for (int j = 0; j < word.length(); j++) {
    String temp = word.substring(j, j + 1);
    if (vowel.indexOf(temp) != -1)    {
        count++;
    }
}
```

III.

```
for (int i = 0; i < word.length(); i++)  {
    for (int k = 0; k < vowel.length(); k++) {
        if (word.substring(i, i+1).equals(vowel.substring(k, k+1))) {
            count++;
        }
    }
}
```

a) I only
b) II only
c) III only
d) I and III only
e) II and III only