Department of Computer Engineering
COE211
Computer Programming

Exam Preparation Exercises
Set1

For the following exercises, consider the declarations below, and then indicate the value that is assigned in each assignment statement. That is, show what is stored in the iResult, fResult, or sResult variables after each assignment. Show each floating point value to three places past the decimal point. Refer to Appendix M in your textbook as needed regarding specific methods.

```
int iResult, num1 = 25, num2 = 40, num3 = 17, num4 = 5;
int num5 = -14, num6 = -27;
double fResult, val1 = 17.0, val2 = 12.78;
String sResult, title = "Java Software Solutions";
```

1. iResult = num1 / num4;
2. fResult = num1 / num4;
3. iResult = num3 / num4;
4. fResult = num3 / num4;
5. fResult = val1 / num4;
6. fResult = val1 / val2;
7. iResult = num1 / num2;
8. fResult = num1 / num2;
9. fResult = (double) num1 / num2;
10. fResult = num1 / (double) num2;
11. fResult = (double) (num1 / num2);
12. iResult = (int) (val1 / num4);
13. fResult = (int) (val1 / num4);
14. fResult = (int) ((double) num1 / num2);
15. iResult = num3 % num4;
16. iResult = num2 % num3;
17. iResult = num3 % num2;
18. iResult = num2 % num4;
19. iResult = num5 % num4;
20. iResult = num6 % num5;
21. iResult = title.length();
22. fResult = title.length();
23. iResult = title.indexOf('t');
24. iResult = title.indexOf('q');
25. iResult = title.lastIndexOf('a');
26. sResult = title.toUpperCase();
27. sResult = title.replace('o', 'X');
28. sResult = title.substring(8);
29. sResult = title.substring(8, 16);
30. iResult = (title.substring(8, 16)).length();
31. sResult = title + num1;

```
32.    sResult = title + num1 + num2;
33.    sResult = title + (num1 + num2);
34.    iResult = Math.abs(num6);
35.    iResult = Math.abs(num1 – num2);
36.    fResult = Math.sqrt(num2);
37.    fResult = Math.pow(num4, 3);
38.    iResult = Math.max(num2, num3);
39.    iResult = Math.floor(val2);
40.    iResult = Math.ceil(val2);
41.    fResult = Math.sin(num2 + num1 * 2);
42.    fResult = Math.PI * num4;
43.    fResult = Math.pow(title.length(), 2) + num3 * Math.sqrt(num3 / num4);
```

For exercises 1 to 12, indicate the range of the possible result of each expression. Assume the following declaration:

```
Random rand = new Random();
```

```
1.    rand.nextInt()
2.    Math.abs (rand.nextInt()) % 20
3.    Math.abs (rand.nextInt() % 20)
4.    Math.abs (rand.nextInt()) % 8 + 1
5.    Math.abs (rand.nextInt()) % 45 + 10
6.    Math.abs (rand.nextInt()) % 100 – 50
7.    rand.nextInt() % 50
8.    rand.nextFloat()
9.    Math.random()
10.   Math.random() * 8
11.   (int) (Math.random() * 20)
12.   (int) (Math.random() * 20) + 1
```

For exercises 13 to 18, write an expression using the Random object declared below that generates a random number in the specified range (inclusive).

```
Random gen = new Random();
13.   0 to 10
14.   0 to 500
15.   1 to 10
16.   1 to 500
17.   25 to 50
18.   -10 to 15
```

For exercises 19 to 20, write an expression using the random method of the Math class that generates a random number in the specified range (inclusive).

```
19.   -5 to 10
20.   0 to 500
21.   25 to 50
22.   1 to 500
```

For exercises 1 to 7, indicate the output that will be produced. Assume the following declarations:

```
final int MAX = 25, LIMIT = 100;
int num1 = 12, num2 = 25, num3 = 87;
```

1.
```
if (num1 > 7 && LIMIT <= 100)
    System.out.println ("apple");
System.out.println ("orange");
```

2.
```
if (num3 < 40 || num3 > 50)
    System.out.println ("apple");
System.out.println ("orange");
```

3.
```
if (MAX == LIMIT || num1*2 == num2)
    System.out.println ("apple");
System.out.println ("orange");
```

4.
```
if (num2%2 != 0 || num3 > LIMIT)
    System.out.println ("apple");
System.out.println ("orange");
```

5.
```
if (MAX == 25 && num2 != MAX || num1 < num3)
    System.out.println ("apple");
System.out.println ("orange");
```

6.
```
if (num3 == 87 || num2 > num1 && MAX > LIMIT)
    System.out.println ("apple");
System.out.println ("orange");
```

7.
```
if ((num3 == 87 || num2 > num1) && MAX > LIMIT)
    System.out.println ("apple");
System.out.println ("orange");
```

For exercises 8 to 21, write code segments that will perform the specified action. Assume that all variables have already been declared and given values.

8. Print "Hurrah!" if sum is evenly divisible by count.

9. Increment the integer variable total if total is zero and decrement total otherwise.

10. Print "num is zero", "num is negative", or "num is positive" as appropriate, based on the current value of num.

11. Print "num is zero", "num is even", or "num is odd" as appropriate based on the current value of num.

22. Print "Victory" only if result is greater than or equal to 500 and penalty is equal to zero (use nested ifs).

13. Print "Victory" only if result is greater than or equal to 500 and penalty is equal to zero (use logical operators).

14. Assign the smallest of two integer values num1 and num2 to the variable smallest. (use an if-else statement)

15. Assign the smallest of two integer values num1 and num2 to the variable smallest. (use the conditional operator)

16. Assign the smallest of three integer values num1, num2, and num3 to the variable smallest. (do not use logical operators)

17. Assign the smallest of three integer values num1, num2, and num3 to the variable smallest. (use logical operators)

18. Print "This character is a vowel." if the character stored in the variable letter is a lowercase vowel.

19. Of the two characters stored in the variables ch1 and ch2, print the one which comes later in the Unicode character set.

20. Print "Uppercase", "Lowercase", or "Not a letter" depending on whether the character stored in ch is an uppercase alphabetic character, a lowercase alphabetic character, or not an alphabetic character at all.

21. Print "Equal" if two floating point values stored in val1 and val2 are exactly equal, "Essentially Equal" if they are within 0.0001 of each other, or "Not Equal" otherwise.

LOOPS

For exercises 1 to 15, indicate the output that will be produced. Assume the following declarations are made just before each exercise. That is, assume these initializations are in effect at the beginning of each problem:

```
final int MIN = 10, MAX = 20;
int num = 15;
```

1.
```
while (num < MAX)
{
    System.out.println (num);
    num = num + 1;
}
```

2.
```
while (num < MAX)
{
    num = num + 1;
    System.out.println (num);
}
```

3.
```
do
{
    num = num + 1;
    System.out.println (num);
}
while (num <= MAX);
```

4.
```
while (num < MAX)
```