

**Part I.** (45 points) Solve each of the following problems. For the multiple choice problems, select the correct answer by placing an “X” in the box beside it.

- (1<sup>pt</sup>) 1. Which one of the following choices is the correct syntax for declaring a decimal number variable named `grade` and initializing its value to 4.0?
- `grade = 4;`  
 `double grade = 4.0;`  
 `grade = double 4.0;`  
 `4.0 = grade;`
- (1<sup>pt</sup>) 2. Which one of the following is **NOT** the name of a Java primitive type?
- `int`  
 `boolean`  
 `double`  
 `String`
- (1<sup>pt</sup>) 3. Which one of the following declarations is **NOT** correct?
- `double duty;`  
 `int end;`  
 `boolean value = 12;`  
 `int start = 34;`
- (1<sup>pt</sup>) 4. Which one of the following shows the proper syntax of an **assignment statement**?
- `variableName = expression;`  
 `expression = expression;`  
 `expression = variableName;`  
 `dataType = variableName;`
- (1<sup>pt</sup>) 5. Which one of the following is **NOT** a correct assignment statement? Assume that `x` and `y` have been declared as type `int`.
- `x = 8;`  
 `x = (3 + 10) / y;`  
 `x = 25 * 3;`  
 `y + 7 = x;`
- (1<sup>pt</sup>) 6. Which one of the following expressions will result in `num` getting assigned the value of -8?
- `int num = 3 + 10 * 4 - 8;`  
 `int num = 7 % 8 * -1;`  
 `int num = -3 - 1 * 2;`  
 `int num = 4 / 3 - 19 / 2;`
- (1<sup>pt</sup>) 7. Which one of the following expressions will result in `rem` getting assigned the value of 1?
- `int rem = 10 % 2;`  
 `int rem = 25 % 7;`  
 `int rem = 13 % 4;`  
 `int rem = 51 % 13;`

1 pt

1 pt

1 pt

1 pt

1 pt

1 pt

1 pt

7 pts

(1<sup>pt</sup>) 8. Which of Java's primitive data types would you use to store the square root of 2?

1 pt

(1<sup>pt</sup>) 9. Which of Java's primitive data types would you use to store your age?

1 pt

(1<sup>pt</sup>) 10. Write a single line of code that will create an integer variable called `num` and store the number 407 in it.

1 pt

(1<sup>pt</sup>) 11. Write a single line of code that will increment the integer variable `num` by 1.

1 pt

(1<sup>pt</sup>) 12. What are the two possible values of a `boolean` variable?

1 pt

(1<sup>pt</sup>) 13. What is the Java operator for boolean **AND-ing**?

1 pt

(1<sup>pt</sup>) 14. What is the Java operator for boolean **OR-ing**?

1 pt

(1<sup>pt</sup>) 15. What is the output of the following:

```
System.out.println( (true&&false) || ((true&&true)||false) );
```

1 pt

(1<sup>pt</sup>) 16. Write a statement that will store the value `true` in a `boolean` variable `b` if the value in the variable `m` is 44 or less.

1 pt

(1<sup>pt</sup>) 17. Write code using a `for` loop that will print out the numbers 2, 4, 6, 8, 10.

1 pt

10 pts

(2<sup>pts</sup>) **18.** Convert the following binary(base-2) numbers to decimal(base-10).

(a) (1 pt) 1011

(b) (1 pt) 10001

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2 pts
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(2<sup>pts</sup>) **19.** Convert the following hexadecimal(base-16) numbers to decimal(base-10).

(a) (1 pt) E7

(b) (1 pt) 2A

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2 pts
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(2<sup>pts</sup>) **20.** Convert the following binary(base-2) numbers to hexadecimal(base-16).

(a) (1 pt) 10010011

(b) (1 pt) 110010100001

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2 pts
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(2<sup>pts</sup>) **21.** Convert the following hexadecimal(base-16) numbers to binary(base-2).

(a) (1 pt) B4

(b) (1 pt) 9C

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2 pts
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8 pts
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- (1<sup>pt</sup>) **22.** Assume that the variable `num` has been declared as type `int`, and that it contains a positive value. Write a code fragment using an `if` statement that displays `multiple of 5` to the terminal output, if the variable `num` is a multiple of 5.

1 pt

- (1<sup>pt</sup>) **23.** Assume that the variable `num` has been declared as type `int`, and that it contains a positive value. Write a code fragment using an `if` statement that displays `even` to the terminal output if the variable `num` is an even number, and `odd` if the variable `num` is an odd number.

1 pt

- (1<sup>pt</sup>) **24.** Assume that the variable `num` has been declared as type `int`, and that it contains a positive value. Write a code fragment using an `if` statement that displays `multiple of 5 and 7` if the variable `num` is a multiple of 5 and a multiple of 7.

1 pt

- (1<sup>pt</sup>) **25.** Assume that the variable `num` has been declared as type `int`, and that it contains a positive value. Write a code fragment using an `if` statement that displays `multiple of 3 not 24` if the variable `num` is a multiple of 3, but not a multiple of 24.

1 pt

4 pts

(1<sup>pt</sup>) **26.** What is the output of the following `while` loop?

```
int num = 0;
while (num < 3)
{
    System.out.println(num);
    num++;
}
```

1 pt

(1<sup>pt</sup>) **27.** What is the output of the following `while` loop?

```
int num = 5;
while (num < 10)
{
    System.out.println(num);
    num += 2;
}
```

1 pt

(1<sup>pt</sup>) **28.** What is the output of the following `while` loop?

```
int num = 10;
int count = 0;
while (num > 8 && count < 3)
{
    System.out.println(num);
    num--;
    count++;
}
```

1 pt

3 pts

(1<sup>pt</sup>) **29.** What is the output of the following for loop?

```
for (int i = 1; i <= 5; i++)
{
    System.out.println(i);
}
```

1 pt

(1<sup>pt</sup>) **30.** What is the output of the following for loop?

```
for (int i = 0; i <= 8; i += 2)
{
    System.out.println(i);
}
```

1 pt

(1<sup>pt</sup>) **31.** What is the output of the following for loop?

```
for (int i = 5; i >= 1; i--)
{
    System.out.println(i);
}
```

1 pt

(1<sup>pt</sup>) **32.** What is the output of the following code fragment?

```
int num = 0;
for (int i = 5; i > 0; i--)
{
    if (i%2 == 1)
    {
        num += 1;
    }
}
System.out.println(num);
```

1 pt

4 pts

- (2<sup>pts</sup>) **33.** Write a Java program that calculates the area of a circle. Your Java program should use the variable `double radius = 5.0`; After you have performed the calculation, print the result.

2 pts

```
public class CircleArea
{
    public static void main(String[] args)
    {
        // YOUR CODE HERE

    }
}
```

- (2<sup>pts</sup>) **34.** Write a Java program that converts a Fahrenheit temperature to a Celsius temperature using the following equation:

2 pts

$$\text{Celsius} = \frac{5}{9} * (\text{Fahrenheit} - 32)$$

Your Java program should use the variable `double fahrenheit = 83.0`; Perform the conversion using the provided equation, and print your result.

```
public class Temperature
{
    public static void main(String[] args)
    {
        // YOUR CODE HERE

    }
}
```

4 pts

- (2<sup>pts</sup>) **35.** The following program segment should calculate the cost of an individual shirt, if they are “buy two get one free,” and if they are originally \$45.00 each. However, the lines of code are not in the correct order. Indicate the proper sequence of code line numbers, for this program to work.

```
double totalCost = price * 2;           // line 1
double pricePerShirt = totalCost / 3;   // line 2
System.out.println(pricePerShirt);     // line 3
double price = 45;                      // line 4
```

2 pts

- (3<sup>pts</sup>) **36.** Write a Java method named `computeGrade` that returns a particular letter grade, depending upon a student’s `gpa`. If the value of the parameter `gpa` is less than 2.5, then `computeGrade` should return "C". If `gpa` is between 2.5 inclusive and 3.5 exclusive, then it should return "B". If `gpa` is greater than or equal to 3.5, then "A" is returned.

```
public class ReportCard
{
    public static String computeGrade(double gpa)
    {
        String letterGrade = "";
        // YOUR CODE HERE

        return letterGrade;
    }

    public static void main(String[] args)
    {
        System.out.println("Letter grade = " + computeGrade(3.9));
    }
}
```

3 pts

5 pts