

Unit1_final_review

1. Consider the following class declarations.

```
public class Alpha
{
    private int answer()
    {
        return 10;
    }
}

public class Beta
{
    public double sample()
    {
        Alpha item = new Alpha();
        double temp = item.answer();
        return temp * 2.0;
    }
}
```

Which of the following best describes why an error occurs when the classes are compiled?

- (A) The class `Alpha` does not have a defined constructor.
- (B) The class `Alpha` must be declared as a subclass of `Beta`.
- (C) The class `Beta` must be declared as a subclass of `Alpha`.
- (D) The `answer` method cannot be accessed from a class other than `Alpha`.
- (E) The result of the method call `item.answer()` cannot be assigned to a variable of type `double`.

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2. Consider the following static method.

```
public static int calculate(int x)
{
    x = x + x;
    x = x + x;
    x = x + x;

    return x;
}
```

Which of the following can be used to replace the body of **calculate** so that the modified version of **calculate** will return the same result as the original version for all **x** ?

- (A) return 3 + x;
- (B) return 3 * x;
- (C) return 4 * x;
- (D) return 6 * x;
- (E) return 8 * x;

3. Consider the following static method.

```
public static int calculate(int x)
{
    x = x + x;
    x = x + x;
    x = x + x;

    return x;
}
```

Which of the following can be used to replace the body of **calculate** so that the modified version of **calculate** will return the same result as the original version for all **x** ?

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- (A) return 2 * x;
 - (B) return 4 * x;
 - (C) return 8 * x;
 - (D) return 3 * calculate(x);
 - (E) return x + calculate(x - 1);
4. Which of the following expressions evaluate to 3.5 ?

- I. (double) 2 / 4 + 3
- II. (double) (2 / 4) + 3
- III. (double) (2 / 4 + 3)

- (A) I only
 - (B) III only
 - (C) I and II only
 - (D) II and III only
 - (E) I, II, and III
5. Consider the following method.

```
public int getTheResult(int n)

{

    int product = 1;

    for (int number = 1; number < n; number++)

    {

        if (number % 2 == 0)

            product *= number;

    }

    return product;

}
```

What value is returned as a result of the call getTheResult(8) ?

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- (A) 48
- (B) 105
- (C) 384
- (D) 5040
- (E) 40320

6. Consider the following code segment.

```
int a = 5;  
int b = 2;  
double c = 3.0;  
System.out.println(5 + a / b * c - 1);
```

What is printed when the code segment is executed?

- (A) 0.6666666666666667
 - (B) 9.0
 - (C) 10.0
 - (D) 11.5
 - (E) 14.0
7. Assume that `x` and `y` are variables of type `int`. Which of the following Java expressions never results in a division by zero?
- (A) `(y / x) == 0`
 - (B) `((y / x) == 0) && (x != 0)`
 - (C) `((y / x) == 0) || (x != 0)`
 - (D) `(x != 0) && ((y / x) == 0)`
 - (E) `(x != 0) || ((y / x) == 0)`

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8. Consider the method `getHours`, which is intended to calculate the number of hours that a vehicle takes to travel between two *mile markers* on a highway if the vehicle travels at a constant speed of 60 miles per hour. A mile marker is a sign showing the number of miles along a road between some fixed location (for example, the beginning of a highway) and the current location.

The following table shows two examples of the intended behavior of `getHours`, based on the `int` parameters `marker1` and `marker2`.

marker1	marker2	Return Value
100	220	2.0
100	70	0.5

Consider the following implementation of `getHours`.

```
public static double getHours(int marker1, int marker2)
{
    /* missing statement */
    return hours;
}
```

Which of the following statements can replace `/* missing statement */` so `getHours` works as intended?

- (A) `double hours = (Math.abs(marker1) - Math.abs(marker2)) / 60.0;`
 - (B) `double hours = Math.abs(marker1 - marker2) / 60.0;`
 - (C) `double hours = Math.abs(marker1 - marker2) / 60.0;`
 - (D) `double hours = Math.abs((marker1 - marker2) / 60);`
 - (E) `double hours = (double) (Math.abs(marker1 - marker2) / 60);`
9. Consider the following code segment.

```
double firstDouble = 2.5;
int firstInt = 30;
int secondInt = 5;
double secondDouble = firstInt - secondInt / firstDouble + 2.5;
```

What value will be assigned to `secondDouble` when the code segment is executed?

- (A) 5.0
- (B) 12.5
- (C) 25.5
- (D) 29.0
- (E) 30.5

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10. Consider the following method.

```
public static int mystery(boolean a, boolean b, boolean c)
{
    int answer = 7;

    if (!a)
    {
        answer += 1;
    }

    if (b)
    {
        answer += 2;
    }

    if (c)
    {
        answer += 4;
    }

    return answer;
}
```

Which of the following method calls will return the value 11 ?

- (A) `mystery(true, true, true)`
- (B) `mystery(true, false, true)`
- (C) `mystery(false, true, false)`
- (D) `mystery(false, false, true)`
- (E) `mystery(false, false, false)`

11. Consider the following code segment.

```
int a = 3 + 2 * 3;
int b = 4 + 3 / 2;
int c = 7 % 4 + 3;
double d = a + b + c;
```

What is the value of `d` after the code segment is executed?

- (A) 14.0
- (B) 18.0
- (C) 20.0
- (D) 20.5
- (E) 26.0

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12. Consider the following code segment.

```
double a = 1.1;

double b = 1.2;

if ((a + b) * (a - b) != (a * a) - (b * b))
{
    System.out.println("Mathematical error!");
}
```

Which of the following best describes why the phrase "Mathematical error!" would be printed?

(Remember that mathematically $(a + b) * (a - b) = a^2 - b^2$.)

- (A) Precedence rules make the if condition true.
 - (B) Associativity rules make the if condition true.
 - (C) Roundoff error makes the if condition true.
 - (D) Overflow makes the if condition true.
 - (E) A compiler bug or hardware error has occurred.
13. What is printed as a result of executing the following statement?

```
System.out.println(404 / 10 * 10 + 1);
```

- (A) 4
- (B) 5
- (C) 41
- (D) 401
- (E) 405

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14. Consider the following code segment.

```
for (int k = 0; k < 9; k = k + 2)
{
    if ((k % 2) != 0)
    {
        System.out.print(k + " ");
    }
}
```

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

- (A) 0 2 4 6 8 10
- (B) 0 2 4 6 8
- (C) 1 3 5 7 9
- (D) 1 3 5 7
- (E) Nothing is printed.

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Directions: Select the choice that best fits each statement. The following question(s) refer to the following incomplete class declaration.

```
public class TimeRecord
{
    private int hours;
    private int minutes; // 0 ≤ minutes < 60
    /** Constructs a TimeRecord object.
     * @param h the number of hours
     *      Precondition:  $h \geq 0$ 
     * @param m the number of minutes
     *      Precondition:  $0 \leq m < 60$ 
     */
    public TimeRecord(int h, int m)
    {
        hours = h;
        minutes = m;
    }

    /** @return the number of hours
     */
    public int getHours()
    { /* implementation not shown */ }

    /** @return the number of minutes
     *      Postcondition:  $0 \leq \text{minutes} < 60$ 
     */
    public int getMinutes()
    { /* implementation not shown */ }

    /** Adds h hours and m minutes to this TimeRecord.
     * @param h the number of hours
     *      Precondition:  $h \geq 0$ 
     * @param m the number of minutes
     *      Precondition:  $m \geq 0$ 
     */
    public void advance(int h, int m)
    {
        hours = hours + h;
        minutes = minutes + m;
        /* missing code */
    }
    // Other methods not shown
}
```

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15. Which of the following can be used to replace / * *missing code* * / so that advance will correctly update the time?
- (A) `minutes = minutes % 60;`
 - (B) `minutes = minutes + hours % 60;`
 - (C) `hours = hours + minutes / 60;`
`minutes = minutes % 60;`
 - (D) `hours = hours + minutes % 60;`
`minutes = minutes / 60;`
 - (E) `hours = hours + minutes / 60;`
-