**U1-4_1** Name

**1.** In the code segment below, assume that the `int` variable `n` has been properly declared and initialized. The code segment is intended to print a value that is `1` more than twice the value of `n`.

```
/* missing code */
System.out.print(result);
```

Which of the following can be used to replace /* *missing code* */ so that the code segment works as intended?

1.
```
int result = 2 * n;
result = result + 1;
```
2.
```
int result = n + 1;
result = result * 2;
```
3.
```
int result = (n + 1) * 2;
```

(A) I only

(B) II only

(C) III only

(D) I and III

(E) II and III

---

**2.** Consider the following code segment.

```
int a = 5;
int b = 8;
int c = 3;
System.out.println(a + b / c * 2);
```

What is printed as a result of executing this code?

## U1-4_1

A 2

B 6

C 8

D 9

E 14

**3.** Consider the following code segment.

```
String str1 = new String("Advanced Placement");
String str2 = new String("Advanced Placement");
if (str1.equals(str2) && str1 == str2)
{
System.out.println("A");
}
else if (str1.equals(str2) && str1 != str2)
{
System.out.println("B");
}
else if (!str1.equals(str2) && str1 == str2)
{
System.out.println("C");
}
else if (!str1.equals(str2) && str1 != str2)
{
System.out.println("D");
}
```

What, if anything, is printed when the code segment is executed?

## U1-4_1

(A) A

(B) B

(C) C

(D) D

(E) Nothing is printed.

---

**4.** In the code segment below, assume that the int variables a and b have been properly declared and initialized.

```
int c = a;
int d = b;
c += 3;
d--;
double num = c;
num /= d;
```

Which of the following best describes the behavior of the code segment?

(A) The code segment stores the value of (a + 3) / b in the variable num.

(B) The code segment stores the value of (a + 3) / (b - 1) in the variable num.

(C) The code segment stores the value of (a + 3) / (b - 2) in the variable num.

(D) The code segment stores the value of (a + 3) / (1 - b) in the variable num.

(E) The code segment causes a runtime error in the last line of code because num is type double and d is type int.

---

## U1-4_1

**5.** Assume that a and b have been defined and initialized as int values. The expression
! ( ! (a != b ) && (b > 7) )
is equivalent to which of the following?

(A) `(a != b) || (b < 7)`

(B) `(a != b) || (b <= 7)`

(C) `(a == b) || (b <= 7)`

(D) `(a != b) && (b <= 7)`

(E) `(a == b) && (b > 7)`

---

**6.** Assume that the boolean variables a and b have been declared and initialized. Consider the following expression.
**(a && (b || !a)) == a && b**
Which of the following best describes the conditions under which the expression will evaluate to true?

(A) Only when a is true

(B) Only when b is true

(C) Only when both a and b are true

(D) The expression will never evaluate to true.

(E) The expression will always evaluate to true.

---

## U1-4_1

**7.** Assume that the boolean variables a, b, c, and d have been declared and initialized. Consider the following expression.

**!( !( a && b ) || ( c || !d ))**

Which of the following is equivalent to the expression?

(A) ( a && b ) && ( !c && d )

(B) ( a || b ) && ( !c && d )

(C) ( a && b ) || ( c || !d )

(D) ( !a || !b ) && ( !c && d )

(E) !( a && b ) && ( c || !d )

---

**8.** Assume that x and y are boolean variables and have been properly initialized.

```
(x || y) && x
```

Which of the following always evaluates to the same value as the expression above?

(A) x

(B) y

(C) x && y

(D) x | | y

(E) x != y

---

## U1-4_1

**9.** Assume that x and y are boolean variables and have been properly initialized.

```
(x && y) && !(x || y)
```

Which of the following best describes the result of evaluating the expression above?

(A) true always

(B) false always

(C) true only when x is true and y is true

(D) true only when x and y have the same value

(E) true only when x and y have different values

---

**10.** Assume that x and y have been declared and initialized with int values. Consider the following Java expression.

```
(y > 10000) || (x > 1000 && x < 1500)
```

Which of the following is equivalent to the expression given above?

(A) (y > 10000 | | x > 1000) && (y > 10000 | | x < 1500)

(B) (y > 10000 | | x > 1000) | | (y > 10000 | | x < 1500)

(C) (y > 10000) && (x > 1000 | | x < 1500)

(D) (y > 10000 && x > 1000) | | (y > 10000 && x < 1500)

(E) (y > 10000 && x > 1000) && (y > 10000 && x < 1500)

---

## U1-4_1

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

| Integer 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";
```

## U1-4_1

(A) II only

(B) III only

(C) I and II only

(D) I and III only

(E) I, II, and III

---

**12.** Consider the following code segment, which is intended to find the average of two positive integers, x and y.

```
int x;
int y;
int sum = x + y;
double average = (double) (sum / 2);
```

Which of the following best describes the error, if any, in the code segment?

(A) There is no error, and the code works as intended.

(B) In the expression (double) (sum / 2), the cast to double is applied too late, so the average will be less than the expected result for even values of sum.

(C) In the expression (double) (sum / 2), the cast to double is applied too late, so the average will be greater than the expected result for even values of sum.

(D) In the expression (double) (sum / 2), the cast to double is applied too late, so the average will be less than the expected result for odd values of sum.

(E) In the expression (double) (sum / 2), the cast to double is applied too late, so the average will be greater than the expected result for odd values of sum.

---

## U1-4_1

**13.** Consider the following code segment.

```
double num = 9 / 4;
System.out.print(num);
System.out.print(" ");
System.out.print((int) num);
```

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

(A) 2 2

(B) 2.0 2

(C) 2.0 2.0

(D) 2.25 2

(E) 2.25 2.0

---

**14.** Consider the following code segment.

```
double x = (int) (5.5 - 2.5);
double y = (int) 5.5 - 2.5;
System.out.println(x - y);
```

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

(A) -1.0

(B) -0.5

(C) 0.0

(D) 0.5

(E) 1.0

---

## U1-4_1

**15.** A pair of number cubes is used in a game of chance. Each number cube has six sides, numbered from 1 to 6, inclusive, and there is an equal probability for each of the numbers to appear on the top side (indicating the cube's value) when the number cube is rolled. The following incomplete statement appears in a program that computes the sum of the values produced by rolling two number cubes.

int sum = / * *missing code* * / ;

Which of the following replacements for /* *missing code* */ would best simulate the value produced as a result of rolling two number cubes?

(A) 2 * (int) (Math.random() * 6)

(B) 2 * (int) (Math.random() * 7)

(C) (int) (Math.random() * 6) + (int) (Math.random() * 6)

(D) (int) (Math.random() * 13)

(E) 2 + (int) (Math.random() * 6) + (int) (Math.random() * 6)

---

**16.** Consider the following code segment.

```
String oldStr = "ABCDEF";
String newStr = oldStr.substring(1, 3) + oldStr.substring(4);
System.out.println(newStr);
```

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

## U1-4_1

(A) ABCD

(B) BCDE

(C) BCEF

(D) BCDEF

(E) ABCDEF

---

**17.** Assume that myList is an ArrayList that has been correctly constructed and populated with objects. Which of the following expressions produces a valid random index for myList?

(A) (int) ( Math.random () * myList.size () ) - 1

(B) (int) ( Math.random () * myList.size () )

(C) (int) ( Math.random () * myList.size () ) + 1

(D) (int) ( Math.random () * (myList.size () + 1) )

(E) Math.random (myList.size () )

---

## U1-4_1

**18.** Consider the following methods, which appear in the same class.

```
public void slope(int x1, int y1, int x2, int y2)
{
int xChange = x2 - x1;
int yChange = y2 - y1;
printFraction(yChange, xChange);
}

public void printFraction(int numerator, int denominator)
{
System.out.print(numerator + "/" + denominator);
}
```

Assume that the method call `slope(1, 2, 5, 10)` appears in a method in the same class. What is printed as a result of the method call?

(A) 8/4

(B) 5/1

(C) 4/8

(D) 2/1

(E) 1/5

---

**19.** Consider the following method, which is intended to calculate and return the expression $\sqrt{\frac{(x+y)^2}{|a-b|}}$.

```
public double calculate(double x, double y, double a, double b)
{
return /* missing code */;
}
```

Which of the following can replace /* *missing code* */ so that the method works as intended?

## U1-4_1

(A) Math.sqrt(x ^ 2, y ^ 2, a - b)

(B) Math.sqrt((x + y) ^ 2) / Math.abs(a, b)

(C) Math.sqrt((x + y) ^ 2 / Math.abs(a - b))

(D) Math.sqrt(Math.pow(x + y, 2) / Math.abs(a, b))

(E) Math.sqrt(Math.pow(x + y, 2) / Math.abs(a - b))

---

**20.** Consider the following method.

```
public double myMethod(int a, boolean b)
{ /* implementation not shown */ }
```

Which of the following lines of code, if located in a method in the same class as myMethod, will compile without error?

(A) int result = myMethod(2, false);

(B) int result = myMethod(2.5, true);

(C) double result = myMethod(0, false);

(D) double result = myMethod(true, 10);

(E) double result = myMethod(2.5, true);

---