U1-4_3

Name

1. Consider the following code segment.

```
int x = 1;
while ( /* missing code */ )
{
  System.out.print(x + " ");
  x = x + 2;
}
```

Consider the following possible replacements for /* missing code */.
1.
x < 6
2.
x != 6
3.
x < 7
Which of the proposed replacements for /* missing code */ will cause the code segment to print only the values 1 3 5?

(A) I only

(B) II only

(C) I and II only

(D) I and III only

(E) I, II, and III

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2. Consider the following code segment.

```
int[] oldArray = {1, 2, 3, 4, 5, 6, 7, 8, 9};
int[][] newArray = new int[3][3];
int row = 0; int col = 0;
for (int index = 0; index < oldArray.length; index++)
{
newArray[row][col] = oldArray[index]; row++;
if ((row % 3) == 0)
{
col++;
row = 0;
}
}
System.out.println(newArray[0][2]);
```

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

(A) 3

(B) 4

(C) 5

(D) 7

(E) 8

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3. Consider the following code segment.

```
int x = 1;
while ( /* condition */ )
{
  if (x % 2 == 0)
  {
    System.out.print(x + " ");
  }
  x = x + 2;
}
```

The following conditions have been proposed to replace /* *condition* */ in the code segment.

1.
x < 0

2.
x <= 1

3.
x < 10

For which of the conditions will nothing be printed?

(A) I only

(B) II only

(C) I and II only

(D) I and III only

(E) I, II, and III

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4. Consider the following code segment.

```
for (int r = 3; r > 0; r--)
{
  int c;

  for (c = 1; c < r; c++)
  {
    System.out.print("-");
  }
  for (c = r ; c <= 3; c++)
  {
    System.out.print("*");
  }

  System.out.println();
}
```

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

(A)
```
--*
-**
***
```

(B)
```
*--
**-
***
```

(C)
```
***
-**
--*
```

(D)
```
***
**-
*--
```

(E)
```
--*
***
--*
```

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5. Consider the following code segment.

```
int count = 0;

for (int x = 0; x < 4; x++)
{
  for (int y = x; y < 4; y++)
  {
    count++;
  }
}
System.out.println(count);
```

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

(A) 4

(B) 8

(C) 10

(D) 16

(E) 20

---

6. 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?

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(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

---

7. Consider the following code segment.

```
int x = 7;
int y = 3;

if ((x < 10) && (y < 0))
  System.out.println("Value is: " + x * y);
else
  System.out.println("Value is: " + x / y);
```

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

(A) Value is: 21

(B) Value is: 2.3333333

(C) Value is: 2

(D) Value is: 0

(E) Value is: 1

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8. Consider the following code segment.

```
for (int k = 1; k <= 100; k++)
  if ((k % 4) == 0)
    System.out.println(k);
```

Which of the following code segments will produce the same output as the code segment above?

(A)
```
for (int k = 1; k <= 25; k++)
  System.out.println(k);
```

(B)
```
for (int k = 1; k <= 100; k = k + 4)
  System.out.println(k);
```

(C)
```
for (int k = 1; k <= 100; k++)
  System.out.println(k % 4);
```

(D)
```
for (int k = 4; k <= 25; k = 4 * k)
  System.out.println(k);
```

(E)
```
for (int k = 4; k <= 100; k = k + 4)
  System.out.println(k);
```

---

9. Consider the following code segment.

```
int sum = 0;
int k = 1;
while (sum < 12 || k < 4)
  sum += k;

System.out.println(sum);
```

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

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(A) 6

(B) 10

(C) 12

(D) 15

(E) Nothing is printed due to an infinite loop.

10. Consider the following code segment.

```
int num = 2574;
int result = 0;

while (num > 0)
{
  result = result * 10 + num % 10;
  num /= 10;
}
System.out.println(result);
```

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

(A) 2

(B) 4

(C) 18

(D) 2574

(E) 4752

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11. Consider the following code segment.

```
for (int outer = 1; outer <= 6; outer++)
{
  for (int inner = outer; inner <= 6; inner++)
  {
    if (inner % 2 == 0)
    {
      System.out.print(inner + "  ");
    }
  }
  System.out.println();
}
```

What will be printed as a result of executing the code segment?

(A)
```
2  4  6
4  6
6
```

(B)
```
2  4  6
2  4  6
2  4  6
```

(C)
```
2  4  6
2  4  6
4  6
4  6
6
6
```

(D)
```
2  4  6
2  4  6
2  4  6
2  4  6
2  4  6
2  4  6
```

(E)
```
2  4
2  4
4
4
```

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12. Consider the following incomplete method, which is intended to return the number of integers that evenly divide the integer inputVal. Assume that inputVal is greater than 0.

```
public static int numDivisors(int inputVal)
{
  int count = 0;
  for (int k = 1; k <= inputVal; k++)
  {
    if ( /* condition */ )
    {
      count++;
    }
  }
  return count;
}
```

Which of the following can be used to replace / * *condition* * / so that numDivisors will work as intended?

(A) inputVal % k == 0

(B) k % inputVal == 0

(C) inputVal % k != 0

(D) inputVal / k == 0

(E) k / inputVal > 0

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13. Consider the following method that is intended to determine if the double values d1 and d2 are close enough to be considered equal. For example, given a tolerance of 0.001, the values 54.32271 and 54.32294 would be considered equal.

```
/** @return true if d1 and d2 are within the specified tolerance,
 *          false otherwise
 */
public boolean almostEqual(double d1, double d2, double tolerance)
{
  /* missing code */
}
```

Which of the following should replace / * missing code * / so that almostEqual will work as intended?

(A) return (d1 - d2) <= tolerance;

(B) return ((d1 + d2) / 2) <= tolerance;

(C) return (d1 - d2) >= tolerance;

(D) return ((d1 + d2) / 2) >= tolerance;

(E) return Math.abs(d1 - d2) <= tolerance;

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14. Consider the following method, biggest, which is intended to return the greatest of three integers. It does not always work as intended.

```
public static int biggest(int a, int b, int c)
{
  if ((a > b) && (a > c))
  {
    return a;
  }
  else if ((b > a) && (b > c))
  {
    return b;
  }
  else
  {
    return c;
  }
}
```

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

(A) biggest always returns the value of a.

(B) biggest may not work correctly when c has the greatest value.

(C) biggest may not work correctly when a and b have equal values.

(D) biggest may not work correctly when a and c have equal values.

(E) biggest may not work correctly when b and c have equal values.

---

15. Consider the following method, which is intended to return true if at least one of the three strings s1, s2, or s3 contains the substring "art". Otherwise, the method should return false.

```
public static boolean containsArt(String s1, String s2, String s3)
{
  String all = s1 + s2 + s3;

  return (all.indexOf("art") != -1);

}
```

Which of the following method calls demonstrates that the method does not work as intended?

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(A) containsArt ("rattrap", "similar", "today")

(B) containsArt ("start", "article", "Bart")

(C) containsArt ("harm", "chortle", "crowbar")

(D) containsArt ("matriculate", "carat", "arbitrary")

(E) containsArt ("darkroom", "cartoon", "articulate")

---

16. Consider the following method, which is intended to return the element of a 2-dimensional array that is closest in value to a specified number, val.

```
/** @return the element of 2-dimensional array mat whose value is closest to val */
public double findClosest(double[][] mat, double val)
{
  double answer = mat[0][0];
  double minDiff = Math.abs(answer - val);
  for (double[] row : mat)
  {
    for (double num : row)
    {
      if ( /* missing code */ )
      {
        answer = num;
        minDiff = Math.abs(num - val);
      }
    }
  }
  return answer;
}
```

Which of the following could be used to replace / * *missing code* * / so that findClosest will work as intended?

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(A) val - row [num] < minDiff

(B) Math.abs (num - minDiff) < minDiff

(C) val - num < 0.0

(D) Math.abs (num - val) < minDiff

(E) Math.abs (row [num] - val) < minDiff

---

17. 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

18. Consider the following method.

```
public int mystery(int num)
{
int x = num;
while (x > 0)
{
if (x / 10 % 2 == 0)
return x;
x = x / 10;
}
return x;
}
```

What value is returned as a result of the call mystery(1034) ?

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(A) 4

(B) 10

(C) 34

(D) 103

(E) 1034

---

19. Consider the following method.

```
public int pick(boolean test, int x, int y)
{
if (test)
return x;
else
return y;
}
```

What value is returned by the following method call?

```
pick(false, pick(true, 0, 1), pick(true, 6, 7))
```

(A) 0

(B) 1

(C) 3

(D) 6

(E) 7

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20. Consider the following method.

```
public String recScramble(String str, int[] positions, int k)
{
if (str == null || str.length() == 0)
return "";

if (str.length() == 1)
return str;
int pos = positions[k];
String nStr = str.substring(pos, pos + 1);
str = str.substring(0, pos) + str.substring(pos + 1);
return nStr + recScramble(str, positions, k + 1);
}
```

Consider the following code segment.

```
int[] indexes = {2, 1, 1};
System.out.println(recScramble("epic", indexes, 0));
```

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

(A) cepi

(B) epci

(C) iecp

(D) iepc

(E) ipce