

MCQ: Iteration

This quiz has 18 questions.

1. Consider the following code segment, which is intended to store the sum of all multiples of 10 between 10 and 100, inclusive ($10 + 20 + \dots + 100$), in the variable `total`.

```
int x = 100;
int total = 0;
while( /* missing code */ )
{
    total = total + x;
    x = x - 10;
}
```

Which of the following can be used as a replacement for `/* missing code */` so that the code segment works as intended?

- (A) `x < 100`
- (B) `x <= 100`
- (C) `x > 10`
- (D) `x >= 10`
- (E) `x != 10`

2. Consider the following incomplete code segment, which is intended to print the sum of the digits in `num`. For example, when `num` is 12345, the code segment should print 15, which represents the sum $1 + 2 + 3 + 4 + 5$.

```
int num = 12345;
int sum = 0;
/* missing loop header */
{
    sum += num % 10;
    num /= 10;
}
System.out.println(sum);
```

Which of the following should replace `/* missing loop header */` so that the code segment will work as intended?

- (A) `while (num > 0)`
- (B) `while (num >= 0)`
- (C) `while (num > 1)`
- (D) `while (num > 2)`
- (E) `while (num > sum)`

3. Consider the following code segment.

```
int a = 1;
String result = "";
while (a < 20)
{
    result += a;
    a += 5;
}
System.out.println(result);
```

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

- (A) 21
- (B) 161116
- (C) 161161
- (D) 16111621
- (E) Nothing is printing because of an infinite loop.

4. Consider the following code segment.

```
int count = 0;
int number = 20;
while (number > 0)
{
    number = number / 2;
    count++;
}
```

What will be the value of `count` after executing the code segment?

- (A) 6
- (B) 5
- (C) 4
- (D) 1
- (E) 0

Unit 04 MCQ: Iteration

5. Consider the following code segment.

```
int total = 0;
for (int k = 0; k <= 100; k += 2)
{
    total += k;
}
```

Which of the following **for** loops could be used to replace the **for** loop in the original code segment so that the original and the revised code segments store the same value in **total**?

- Ⓐ `for (int k = 0; k < 100; k += 2)`
`{`
 `total += k + 1;`
`}`
- Ⓑ `for (int k = 1; k < 101; k += 2)`
`{`
 `total += k - 1;`
`}`
- Ⓒ `for (int k = 0; k <= 101; k += 2)`
`{`
 `total += k + 1;`
`}`
- Ⓓ `for (int k = 1; k <= 101; k += 2)`
`{`
 `total += k + 1;`
`}`
- Ⓔ `for (int k = 1; k <= 101; k += 2)`
`{`
 `total += k - 1;`
`}`

6. Consider the following code segment where **num** is a properly declared integer initialized to a positive value.

```
int total = 0;
while (num > 0)
{
    total += num % 10;
    num /= 10;
}
```

Which of the following code segments could replace the **while** loop without changing the resulting value of **total**?

- I. `for (int h = 0; h < num; h++)`
`{`
 `total += num % 10;`
 `num /= 10;`
`}`
- II. `for (int j = num; j > 0; j--)`
`{`
 `total += j % 10;`
`}`
- III. `for (int k = num; k > 0; k /= 10)`
`{`
 `total += k % 10;`
`}`
- Ⓐ I only
 Ⓑ II only
 Ⓒ III only
 Ⓓ I and II
 Ⓔ II and III

Unit 04 MCQ: Iteration

7. Consider the following code segments, which differ only in their loop header.

Code Segment I

```
for (int i = 0; i < 10; i++)
{
    System.out.print( "*" );
}
```

Code Segment II

```
for (int i = 1; i <= 10; i++)
{
    System.out.print( "*" );
}
```

Which of the following best explains how the difference in the two loop headers affects the output?

- Ⓐ The output of the code segments is the same because the loops in each code segment terminate when `i` is 10
- Ⓑ The output of the code segments is the same because the loops in both code segments iterate 10 times.
- Ⓒ The output of the code segments is different because code segment I iterates from `i = 0` to `i = 9` and code segment II iterates from `i = 1` to `i = 10`.
- Ⓓ The output of the code segments is different because code segment I iterates from `i = 0` to `i = 10` and code segment II iterates from `i = 1` to `i = 11`.
- Ⓔ Neither code segment produces output because both loop conditions are initially false.

8. Consider the following code segment.

```
int n = 6;
for (int i = 1; i < n; i = i + 2) //L2
{
    System.out.print(i + " ");
}
```

Which of the following best explains how changing `i < n` to `i <= n` in line 2 (L2) will change the result?

- Ⓐ An additional value will be printed because the for loop will iterate one additional time.
- Ⓑ One fewer value will be printed because the for loop will iterate one fewer time.
- Ⓒ There will be no change to the program output because the loop will iterate the same number of times.
- Ⓓ An infinite loop will occur because the loop condition will never be false.
- Ⓔ The body of the loop will not execute at all because the loop condition will initially be false.

9. Consider the following code segment.

```
String temp = "Mississippi";
String part = "si";

int position = 0;
int count = 0;
while(temp.indexOf(part) >= 0)
{
    position = temp.indexOf(part);
    count++;
    temp = temp.substring(position+1);
}
System.out.println(count);
```

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

- Ⓐ 0
- Ⓑ 1
- Ⓒ 2
- Ⓓ 3
- Ⓔ Nothing is printed.

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10. Consider the following code segment.

```
String word = "computer";
int num = 3;
String result = "";

for (int k = num; k >= 0; k--)
{
    result += word.substring(0, k);
}

System.out.print(result);
```

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

- (A) ccocom
- (B) comcoc
- (C) ccocomcomp
- (D) compcomcoc
- (E) comcomcomcom

11. Consider the following code segment.

```
String str = "AP-CSA";
for (int i=0; i<str.length(); i++)
{
    if (str.substring(i,
        i+1).equals("A"))
    {
        System.out.print(i + " ");
    }
}
```

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

- (A) 0
- (B) 5
- (C) 0 5
- (D) 0 6
- (E) 1 6

12. Consider the following code segment.

```
for (int k = 0; k < 4; k++)
{
    /* missing loop header */
    {
        System.out.print(k);
    }
    System.out.println();
}
```

The code segment is intended to produce the following output.

```
0
11
222
3333
```

Which of the following can be used to replace */* missing loop header */* so that the code segment will work as intended?

- (A) for (int h = 0; h < k; h++)
- (B) for (int h = 1; h < k + 1; h++)
- (C) for (int h = 0; h < 3; h++)
- (D) for (int h = k; h >= 0; h--)
- (E) for (int h = k; h <= 0; h--)

13. Consider the following code segment.

```
int a = 1;
while (a <= 2)
{
    int c = 1;
    while (/* missing condition */)
    {
        System.out.print("");
        c++;
    }
    a++;
}
```

The code segment is intended to print "*****".

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

- (A) c <= 2
- (B) c < 3
- (C) c <= 3
- (D) c > 2
- (E) c >= 3

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14. Consider the following code segment.

```
for (int j = 0; j < 4; j++)
{
    for (int k = 0; k < j; k++)
    {
        System.out.println("hello");
    }
}
```

Which of the following best explains how changing the inner for loop header to `for (int k = j; k < 4; k++)` will affect the output of the code segment?

- (A) The output of the code segment will be unchanged.
- (B) The string "hello" will be printed three fewer times because the inner loop will iterate one fewer time for each iteration of the outer loop.
- (C) The string "hello" will be printed four fewer times because the inner loop will iterate one fewer time for each iteration of the outer loop.
- (D) The string "hello" will be printed three additional times because the inner loop will iterate one additional time for each iteration of the outer loop.
- (E) The string "hello" will be printed four additional times because the inner loop will iterate one additional time for each iteration of the outer loop.

15. Consider the following code segment.

```
for (int i = 0; i < 5; i++) //Line 1
{
    for (int j = 0; j < 5; j++)
    {
        int k = i + j;
        System.out.print(k + " ");
    }
}
```

Which of the following best describes the result of changing `i < 5` to `i > 5` in line 1?

- (A) The numbers will be printed in the reverse order as they were in the original code segment because the outer loop will occur in reverse order.
- (B) Five additional values will be printed because the outer for loop will iterate one additional time.
- (C) An infinite loop will occur because the termination condition of the loop will never be reached.
- (D) There will be no change to the program output.
- (E) Nothing will be printed because the body of the outer for loop will not execute at all.

16. Consider the following code segment.

```
int a = 100;
while (a > 1)
{
    System.out.println("$");
    a /= 2;
}
```

How many \$'s are printed as a result of executing the code segment?

- (A) 0
- (B) 5
- (C) 6
- (D) 7
- (E) 50

17. Consider the following code segment.

```
int k = 35;
while (k >= 0)
{
    System.out.println("X");
    k -= 5;
}
```

How many times will the string "X" be printed as a result of executing the code segment?

- (A) 1
- (B) 7
- (C) 8
- (D) 35
- (E) More than 35 times, because the code segment will cause an infinite loop.

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18. Consider the following code segment.

```
int j = 1;
while (j <= 5)
{
    for (int k = 4; k > 1; k--)
    {
        System.out.println("ha"); //L6
    }
    j++;
}
```

How many times will the print statement on line 6 (L6) execute?

- Ⓐ 15
- Ⓑ 16
- Ⓒ 20
- Ⓓ 24
- Ⓔ 25