

## 1: Primitive Types MCQ

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?

- I. `int result = 2 * n;  
result = result + 1;`
- II. `int result = n + 1;  
result = result * 2;`
- III. `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?

- (A) 2
  - (B) 6
  - (C) 8
  - (D) 9
  - (E) 14
3. 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?

**1: Primitive Types MCQ**

- (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`.

4. 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`.

## 1: Primitive Types MCQ

5. 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;`

6. 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** ?

**1: Primitive Types MCQ**

- (A) `return 2 * x;`
- (B) `return 4 * x;`
- (C) `return 8 * x;`
- (D) `return 3 * calculate(x);`
- (E) `return x + calculate(x - 1);`

7. 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
8. 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

9. 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

## 1: Primitive Types MCQ

10. Consider the following code segment.

```
int w = 1;
int x = w / 2;
double y = 3;
int z = (int) (x + y);
```

Which of the following best describes the results of compiling the code segment?

- (A) The code segment compiles without error.
  - (B) The code segment does not compile, because the `int` variable `x` cannot be assigned the result of the operation `w / 2`.
  - (C) The code segment does not compile, because the integer value `3` cannot be assigned to the `double` variable `y`.
  - (D) The code segment does not compile, because the operands of the addition operator cannot be of different types `int` and `double`.
  - (E) The code segment does not compile because the result of the addition operation is of type `double` and cannot be cast to an `int`.
11. Consider the following code segment.

```
double x = 4.5;
int y = (int) x * 2;
System.out.print(y);
```

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

- (A) 8
  - (B) 8.0
  - (C) 9
  - (D) 9.0
  - (E) 10
12. The code segment below is intended to calculate the circumference `c` of a circle with the diameter `d` of 1.5. The circumference of a circle is equal to its diameter times `pi`.

```
/* missing declarations */
c = pi * d;
```

Which of the following variable declarations are most appropriate to replace `/* missing declarations */` in this code segment?

**1: Primitive Types MCQ**

- `int pi = 3.14159;`
- (A) `int d = 1.5;`  
`final int c;`
- `final int pi = 3.14159;`
- (B) `int d = 1.5;`  
`int c;`
- `final double pi = 3.14159;`
- (C) `double d = 1.5;`  
`double c;`
- `double pi = 3.14159;`
- (D) `double d = 1.5;`  
`final double c = 0.0;`
- `final double pi = 3.14159;`
- (E) `final double d = 1.5;`  
`final double c = 0.0;`

13. Consider the following code segment.

```
int a = 5;
int b = 4;
int c = 2;
a *= 3;
b += a;
b /= c;
System.out.print(b);
```

What is printed when the code segment is executed?

- (A) 2
- (B) 4
- (C) 9
- (D) 9.5
- (E) 19

14. Consider the following code segment.

```
int x = 5;
int y = 6;
/* missing code */
z = (x + y) / 2;
```

Which of the following can be used to replace `/* missing code */` so that the code segment will compile?

- I. `int z = 0;`
- II. `int z;`
- III. `boolean z = false;`

**1: Primitive Types MCQ**

- (A) I only
- (B) II only
- (C) I and II only
- (D) II and III only
- (E) I, II, and III

15. A code segment (not shown) is intended to determine the number of players whose average score in a game exceeds 0.5. A player's average score is stored in `avgScore`, and the number of players who meet the criterion is stored in the variable `count`.

Which of the following pairs of declarations is most appropriate for the code segment described?

- (A) `double avgScore;`  
`boolean count;`
- (B) `double avgScore;`  
`double count;`
- (C) `double avgScore;`  
`int count;`
- (D) `int avgScore;`  
`boolean count;`
- (E) `int avgScore;`  
`int count;`

16. 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

17. Consider the following code segment.

```
System.out.print("Hello System.out.println");  
System.out.print("!!!");
```

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

**1: Primitive Types MCQ**

- (A) `Hello!!!`
- (B) `Hello System.out.println!!!`
- (C) `Hello`  
`!!!`
- (D) `Hello System.out.println`  
`!!!`
- (E) Nothing is printed because the text `"System.out.println"` cannot appear inside a print statement.

18. The following code segment is intended to interchange the values of the `int` variables `x` and `y`. Assume that `x` and `y` have been properly declared and initialized.

```
int temp = x;  
/* missing code */
```

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

- (A) `x = y;`  
`x = temp;`
- (B) `x = y;`  
`y = temp;`
- (C) `y = x;`  
`x = temp;`
- (D) `y = x;`  
`temp = y;`
- (E) `y = x;`  
`temp = x;`

19. Consider the following code segment.

```
num += num;  
num *= num;
```

Assume that `num` has been previously declared and initialized to contain an integer value. Which of the following best describes the behavior of the code segment?

- (A) The value of `num` is two times its original value.
- (B) The value of `num` is the square its original value.
- (C) The value of `num` is two times the square of its original value.
- (D) The value of `num` is the square of twice its original value.
- (E) It cannot be determined without knowing the initial value of `num`.



**1: Primitive Types MCQ**

20. Consider the following code segment, which is intended to print the digits of the two-digit `int` number `num` in reverse order. For example, if `num` has the value 75, the code segment should print 57. Assume that `num` has been properly declared and initialized.

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

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

- (A) `int onesDigit = num % 10;`  
`int tensDigit = num / 10;`
- (B) `int onesDigit = num / 10;`  
`int tensDigit = num % 10;`
- (C) `int onesDigit = 10 / num;`  
`int tensDigit = 10 % num;`
- (D) `int onesDigit = num % 100;`  
`int tensDigit = num / 100;`
- (E) `int onesDigit = num / 100;`  
`int tensDigit = num % 100;`

21. 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
22. Which of the following expressions evaluate to 7 ?

- I. `9 + 10 % 12`
- II. `(9 + 10) % 12`
- III. `9 - 2 % 12`

- (A) I only
- (B) II only
- (C) I and III
- (D) II and III
- (E) I, II, and III

**1: Primitive Types MCQ**

23. Consider the following code segment.

```
int x = 5;  
x += 6 * 2;  
x -= 3 / 2;
```

What value is stored in `x` after the code segment executes?

- (A) -1.5
  - (B) 1
  - (C) 9
  - (D) 15.5
  - (E) 16
24. Consider the following code segment, where `k` and `count` are properly declared and initialized `int` variables.

```
k++;  
k++;  
count++;  
k--;  
count++;  
k--;
```

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

- (A) The code segment leaves both `k` and `count` unchanged.
  - (B) The code segment increases both `k` and `count` by 2.
  - (C) The code segment increases `k` by 4 and `count` by 2.
  - (D) The code segment leaves `k` unchanged and increases `count` by 2.
  - (E) The code segment increases `k` by 2 and leaves `count` unchanged.
25. Consider the following code segment.

```
int a = 4;  
int b = 5;  
a++;  
b++;  
int c = a + b;  
a -= 1;  
System.out.println(a + c);
```

What is printed when the code segment is executed?

**1: Primitive Types MCQ**

- (A) 9
- (B) 10
- (C) 14
- (D) 15
- (E) 25

26. Consider the following code segment.

```
System.out.print("AP");  
System.out.println();  
System.out.println("CS");  
System.out.print("A");
```

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

- (A) APCSA
- (B) APCS  
A
- (C) AP  
CSA
- (D) AP  
CS  
A  
AP
- (E) CS  
A

27. Consider the following code segment.

```
System.out.print(I do not fear computers. ); // Line 1  
System.out.println(I fear the lack of them.); // Line 2  
System.out.println(--Isaac Asimov); // Line 3
```

The code segment is intended to produce the following output but may not work as intended.

```
I do not fear computers. I fear the lack of them.  
--Isaac Asimov
```

Which change, if any, can be made so that the code segment produces the intended output?

- (A) In line 1, `print` should be changed to `println`.
- (B) In lines 2 and 3, `println` should be changed to `print`.
- (C) The statement `System.out.println()` should be inserted between lines 2 and 3.
- (D) In lines 1, 2, and 3, the text that appears in parentheses should be enclosed in quotation marks.
- (E) No change is needed; the code segment works correctly as is.

## 1: Primitive Types MCQ

28. Consider the following code segment.

```
System.out.print(*);      // Line 1
System.out.print("*");    // Line 2
System.out.println();     // Line 3
System.out.println("*");  // Line 4
```

The code segment is intended to produce the following output, but may not work as intended.

```
**
*
```

Which line of code, if any, causes an error?

- (A) Line 1
  - (B) Line 2
  - (C) Line 3
  - (D) Line 4
  - (E) The code segment works as intended.
29. Consider the following code segment.

```
System.out.print("*");
System.out.println("***");
System.out.println("****");
System.out.print("*****");
```

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

- (A) \*  
\*\*  
\*\*\*  
\*\*\*\*
- (B) \*  
\*\*  
\*\*\*\*\*
- (C) \*  
\*\*\*\*\*  
\*\*\*\*
- (D) \*\*\*  
\*\*\*  
\*\*\*\*
- (E) \*\*\*  
\*\*\*\*\*

## 1: Primitive Types MCQ

30. Consider the following code segment.

```
System.out.print("One");    // Line 1
System.out.print("Two");    // Line 2
System.out.print("Three");  // Line 3
System.out.print("Four");   // Line 4
```

The code segment is intended to produce the following output, but does not work as intended.

```
OneTwo
ThreeFour
```

Which of the following changes can be made so that the code segment produces the intended output?

- (A) Changing `print` to `println` in line 1 only
  - (B) Changing `print` to `println` in line 2 only
  - (C) Changing `print` to `println` in line 3 only
  - (D) Changing `print` to `println` in lines 2 and 3 only
  - (E) Changing `print` to `println` in lines 1, 2, 3, and 4
31. 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

32. The following code segment is intended to round `val` to the nearest integer and print the result.

```
double val = -0.7;
int roundedVal = (int) (val + 0.5);
System.out.println(roundedVal);
```

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

**1: Primitive Types MCQ**

- (A) The code segment works as intended.
- (B) The code segment does not work as intended because `val` and `roundedVal` should be declared as the same data type.
- (C) The code segment does not work as intended because the expression `(val + 0.5)` should be cast to a `double` instead of an `int`.
- (D) The code segment does not work as intended because `val` should be cast to an `int` before `0.5` is added to it.
- (E) The code segment does not work as intended because the expression `(int) (val + 0.5)` rounds to the nearest integer only when `val` is positive.

**33.** Which of the following statements stores the value 3 in `x` ?

- (A) `int x = 4 / 7;`
- (B) `int x = 7 / 3;`
- (C) `int x = 7 / 4;`
- (D) `int x = 5 % 8;`
- (E) `int x = 8 % 5;`