

chap 1: Primitive Types

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?

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- (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`.

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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** ?

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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);`

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

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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?

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- ```
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;`

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- (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?

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- (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. 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
19. 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;`



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20. 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`.
21. 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;
```

22. 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?

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

23. 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

24. 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

25. 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?

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- (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.

26. 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?

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

27. 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

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28. 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.
29. 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.
30. 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?

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- (A) 

```
 *
 **


```
- (B) 

```
 *
 **

```
- (C) 

```
 *


```
- (D) 

```



```
- (E) 

```


```

31. 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
32. 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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33. 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?

- (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.
34. 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;`