

1. Which of the following are valid Java identifiers? (Choose all that apply)

- A. ASB
- B. _helloWorld
- C. true
- D. java.lang
- E. Public
- F. 1980_s

2. What is the output of the following program?

```
1: public class WaterBottle {
2: private String brand;
3: private boolean empty;
4: public static void main(String[] args) {
5: WaterBottle wb = new WaterBottle();
6: System.out.print("Empty = " + wb.empty);
7: System.out.print(", Brand = " + wb.brand);
8: } }
```

- A. Line 6 generates a compiler error.
- B. Line 7 generates a compiler error.
- C. There is no output.
- D. Empty = false, Brand = null
- E. Empty = false, Brand =
- F. Empty = null, Brand = null

3. Which of the following are true? (Choose all that apply)

- ```
4: short numPets = 5;
5: int numGrains = 5.6;
6: String name = "Scruffy";
7: numPets.length();
8: numGrains.length();
9: name.length();
```
- A. Line 4 generates a compiler error.
  - B. Line 5 generates a compiler error.
  - C. Line 6 generates a compiler error.
  - D. Line 7 generates a compiler error.
  - E. Line 8 generates a compiler error.
  - F. Line 9 generates a compiler error.
  - G. The code compiles as is.

4. Given the following class, which of the following is true? (Choose all that apply)

```
1: public class Snake {
2:
3: public void shed(boolean time) {
4:
5: if (time) {
6:
7: }
8: System.out.println(result);
9:
10: }
11: }
```

- A. If String result = "done"; is inserted on line 2, the code will compile.
- B. If String result = "done"; is inserted on line 4, the code will compile.
- C. If String result = "done"; is inserted on line 6, the code will compile.
- D. If String result = "done"; is inserted on line 9, the code will compile.
- E. None of the above changes will make the code compile.

5. Given the following classes, which of the following can independently replace INSERT IMPORTS HERE to make the code compile? (Choose all that apply)

```
package aquarium;
public class Tank { }
package aquarium.jellies;
public class Jelly { }
package visitor;
INSERT IMPORTS HERE
public class AquariumVisitor {
 public void admire(Jelly jelly) { } }
```

- A. import aquarium.\*;
- B. import aquarium.\* Jelly;
- C. import aquarium.jellies.Jelly;
- D. import aquarium.jellies.\*;

- E. import aquarium.jellies.Jelly.\*;
- F. None of these can make the code compile.

6. Given the following classes, what is the maximum number of imports that can be removed and have the code still compile?

```
package aquarium; public class Water { }
package aquarium;
import java.lang.*;
import java.lang.System;
import aquarium.Water;
import aquarium.*;
public class Tank {
 public void print(Water water) {
 System.out.println(water); } }
```

- A. 0
- B. 1
- C. 2
- D. 3
- E. 4
- F. Does not compile.

7. Given the following classes, which of the following snippets can be inserted in place of INSERT IMPORTS HERE and have the code compile? (Choose all that apply)

```
package aquarium;
public class Water {
 boolean salty = false;
}
package aquarium.jellies;
public class Water {
 boolean salty = true;
}
package employee;
INSERT IMPORTS HERE
public class WaterFiller {
 Water water;
}
```

- A. import aquarium.\*;
- B. import aquarium.Water;
- C. import aquarium.jellies.\*;
- D. import aquarium.\*;
- E. import aquarium.Water;
- F. None of these imports can make the code compile.

8. Given the following class, which of the following calls print out Blue Jay? (Choose all that apply)

```
public class BirdDisplay {
 public static void main(String[] name) {
 System.out.println(name[1]);
 } }
```

- A. java BirdDisplay Sparrow Blue Jay
- B. java BirdDisplay Sparrow "Blue Jay"
- C. java BirdDisplay Blue Jay Sparrow
- D. java BirdDisplay "Blue Jay" Sparrow
- E. java BirdDisplay.class Sparrow "Blue Jay"
- F. java BirdDisplay.class "Blue Jay" Sparrow
- G. Does not compile.

9. Which of the following legally fill in the blank so you can run the main() method from the command line? (Choose all that apply)

```
public static void main()
```

- A. String[] \_names
- B. String[] 123
- C. String abc[]
- D. String \_Names[]
- E. String... \$n
- F. String names
- G. None of the above.

10. Which of the following are legal entry point methods that can be run from the command line? (Choose all that apply)

- A. private static void main(String[] args)
- B. public static final main(String[] args)
- C. public void main(String[] args)
- D. public static void test(String[] args)
- E. public static void main(String[] args)
- F. public static main(String[] args)
- G. None of the above.

11. Which of the following are true? (Choose all that apply)

- A. An instance variable of type double defaults to null.
- B. An instance variable of type int defaults to null.
- C. An instance variable of type String defaults to null.
- D. An instance variable of type double defaults to 0.0.
- E. An instance variable of type int defaults to 0.0.
- F. An instance variable of type String defaults to 0.0.
- G. None of the above.

12. Which of the following are true? (Choose all that apply)

- A. A local variable of type boolean defaults to null.
- B. A local variable of type float defaults to 0.
- C. A local variable of type Object defaults to null.
- D. A local variable of type boolean defaults to false.
- E. A local variable of type boolean defaults to true.
- F. A local variable of type float defaults to 0.0.
- G. None of the above.

13. Which of the following are true? (Choose all that apply)

- A. An instance variable of type boolean defaults to false.
- B. An instance variable of type boolean defaults to true.
- C. An instance variable of type Object defaults to null.
- D. An instance variable of type int defaults to 0.
- E. An instance variable of type int defaults to 0.0.
- F. An instance variable of type int defaults to null.
- G. None of the above.

14. Given the following class in the file /my/directory/named/A/Bird.java: INSERT CODE HERE

```
public class Bird { }
```

Which of the following replaces INSERT CODE HERE if we compile from /my/directory?

(Choose all that apply)

- A. package my.directory.named.a;
- B. package my.directory.named.A;
- C. package named.a;
- D. package named.A;
- E. package a;
- F. package A;
- G. Does not compile.

15. Which of the following lines of code compile? (Choose all that apply)

- A. int i1 = 1\_234;
- B. double d1 = 1\_234\_0;
- C. double d2 = 1\_234\_0;
- D. double d3 = 1\_234\_0;
- E. double d4 = 1\_234.0;
- F. None of the above.

16. Given the following class, which of the following lines of code can replace INSERT CODE HERE to make the code compile? (Choose all that apply)

```
public class Price {
 public void admission() {
 INSERT CODE HERE
 System.out.println(amount);
 }
}
```

- A. int amount = 9L;
- B. int amount = 0b101;
- C. int amount = 0xE;
- D. double amount = 0xE;
- E. double amount = 1\_2\_0\_0\_0;
- F. int amount = 1\_2\_;
- G. None of the above.

17. Which of the following are true? (Choose all that apply)

```
public class Bunny {
 public static void main(String[] args) {
 Bunny bun = new Bunny();
 }
}
```

- A. Bunny is a class.
- B. bun is a class.
- C. main is a class.
- D. Bunny is a reference to an object.
- E. bun is a reference to an object.
- F. main is a reference to an object.
- G. None of the above.

18. Which represent the order in which the following statements can be assembled into a program that will compile successfully? (Choose all that apply)

- A: class Rabbit { }
- B: import java.util.\*;
- C: package animals;
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- A. A, B, C
- B. B, C, A
- C. C, B, A
- D. B, A
- E. C, A
- F. A, C
- G. A, B

19. Suppose we have a class named Rabbit. Which of the following statements are true? (Choose all that apply)

```
1: public class Rabbit {
2: public static void main(String[] args) {
3: Rabbit one = new Rabbit();
4: Rabbit two = new Rabbit();
5: Rabbit three = one;
6: one = null;
7: Rabbit four = one;
8: three = null;
9: two = null;
10: two = new Rabbit();
11: System.gc();
12: } }
```

A. The Rabbit object from line 3 is first eligible for garbage collection immediately following line 6.

B. The Rabbit object from line 3 is first eligible for garbage collection immediately following line 8.

C. The Rabbit object from line 3 is first eligible for garbage collection immediately following line 12.

D. The Rabbit object from line 4 is first eligible for garbage collection immediately following line 9.

E. The Rabbit object from line 4 is first eligible for garbage collection immediately following line 11.

F. The Rabbit object from line 4 is first eligible for garbage collection immediately following line 12.

20. What is true about the following code? (Choose all that apply)

```
public class Bear {
 protected void finalize() {
 System.out.println("Roar!");
 }
}
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public static void main(String[] args) {
 Bear bear = new Bear();
 bear = null;
 System.gc();
}
```

A. finalize() is guaranteed to be called.

B. finalize() might or might not be called

C. finalize() is guaranteed not to be called.

D. Garbage collection is guaranteed to run.

E. Garbage collection might or might not run.

- F. Garbage collection is guaranteed not to run.  
G. The code does not compile.

**21. What does the following code output?**

```
1: public class Salmon {
2: int count;
3: public void Salmon() {
4: count = 4;
5: }
6: public static void main(String[] args) {
7: Salmon s = new Salmon();
8: System.out.println(s.count);
9: } }
```

- A. 0  
B. 4  
C. Compilation fails on line 3.  
D. Compilation fails on line 4.  
E. Compilation fails on line 7.  
F. Compilation fails on line 8.

**22. Which of the following are true statements? (Choose all that apply)**

- A. Java allows operator overloading.  
B. Java code compiled on Windows can run on Linux.  
C. Java has pointers to specific locations in memory.  
D. Java is a procedural language.  
E. Java is an object-oriented language.  
F. Java is a functional programming language.

**23. Which of the following are true? (Choose all that apply)**

- A. javac compiles a .class file into a .java file.  
B. javac compiles a .java file into a .bytecode file.  
C. javac compiles a .java file into a .class file.  
D. Java takes the name of the class as a parameter.  
E. Java takes the name of the .bytecode file as a parameter.  
F. Java takes the name of the .class file as a parameter.

**24. Which of the following Java operators can be used with boolean variables? (Choose all that apply)**

- A. ==  
B. +  
C. --  
D. !  
E. %  
F. <=

**25. What data type (or types) will allow the following code snippet to compile? (Choose all that apply)**

```
byte x = 5;
byte y = 10;
z = x + y;
```

- A. int  
B. long  
C. boolean  
D. double  
E. short  
F. byte

**26. What is the output of the following application?**

```
1: public class CompareValues {
2: public static void main(String[] args) {
3: int x = 0;
4: while(x++ < 10) {}
5: String message = x > 10 ? "Greater than" : false;
6: System.out.println(message+" "+x);
7: }
8: }
```

- A. Greater than,10  
B. false,10  
C. Greater than,11  
D. false,11  
E. The code will not compile because of line 4.  
F. The code will not compile because of line 5.

**27. What change would allow the following code snippet to compile? (Choose all that apply)**

```
3: long x = 10;
4: int y = 2 * x;
A. No change; it compiles as is.
B. Cast x on line 4 to int.
C. Change the data type of x on line 3 to short.
D. Cast 2 * x on line 4 to int.
E. Change the data type of y on line 4 to short.
F. Change the data type of y on line 4 to long.
```

**28. What is the output of the following code snippet?**

```
3: java.util.List<Integer> list = new java.util.ArrayList<Integer>();
4: list.add(10);
5: list.add(14);
6: for(int x : list) {
7: System.out.print(x + " ");
8: break;
9: }
```

- A. 10, 14,  
B. 10, 14  
C. 10,  
D. The code will not compile because of line 7.  
E. The code will not compile because of line 8.  
F. The code contains an infinite loop and does not terminate.

**29. What is the output of the following code snippet?**

```
3: int x = 4;
4: long y = x * 4 - x++;
5: if(y<10) System.out.println("Too Low");
6: else System.out.println("Just right");
7: else System.out.println("Too High");
A. Too Low
B. Just Right
C. Too High
D. Compiles but throws a NullPointerException.
E. The code will not compile because of line 6.
F. The code will not compile because of line 7.
```

**30. What is the output of the following code?**

```
1: public class TernaryTester {
2: public static void main(String[] args) {
3: int x = 5;
4: System.out.println(x > 2 ? x < 4 ? 10 : 8 : 7);
5: }}
A. 5
B. 4
C. 10
D. 8
E. 7
F. The code will not compile because of line 4.
```

**31. What is the output of the following code snippet?**

```
3: boolean x = true, z = true;
4: int y = 20;
5: x = (y != 10) ^ (z=false);
6: System.out.println(x+" "+y+" "+z);
A. true, 10, true
B. true, 20, false
C. false, 20, true
D. false, 20, false
E. false, 20, true
F. The code will not compile because of line 5.
```

**32. How many times will the following code print "Hello World"?**

```
3: for(int i=0; i<10 ;) {
4: i = i++;
5: System.out.println("Hello World");
6: }
A. 9
B. 10
C. 11
D. The code will not compile because of line 3.
E. The code will not compile because of line 5.
```

F. The code contains an infinite loop and does not terminate.

33. What is the output of the following code?

```
3: byte a = 40, b = 50;
4: byte sum = (byte) a + b;
5: System.out.println(sum);
```

- A. 40
- B. 50
- C. 90

D. The code will not compile because of line 4.

E. An undefined value.

34. What is the output of the following code?

```
1: public class ArithmeticSample {
2: public static void main(String[] args) {
3: int x = 5 * 4 % 3;
4: System.out.println(x);
5: }}
```

A. 2

B. 3

C. 5

D. 6

E. The code will not compile because of line 3.

35. What is the output of the following code snippet?

```
3: int x = 0;
4: String s = null;
5: if(x == s) System.out.println("Success");
6: else System.out.println("Failure");
```

A. Success

B. Failure

C. The code will not compile because of line 4.

D. The code will not compile because of line 5.

36. What is the output of the following code snippet?

```
3: int x1 = 50, x2 = 75;
4: boolean b = x1 >= x2;
5: if(b == true) System.out.println("Success");
6: else System.out.println("Failure");
```

A. Success

B. Failure

C. The code will not compile because of line 4.

D. The code will not compile because of line 5.

37. What is the output of the following code snippet?

```
3: int c = 7;
4: int result = 4;
5: result += ++c;
6: System.out.println(result);
```

A. 8

B. 11

C. 12

D. 15

E. 16

F. The code will not compile because of line 5.

38. What is the output of the following code snippet?

```
3: int x = 1, y = 15;
4: while x < 10
5: y--;
6: x++;
7: System.out.println(x+" "+y);
```

A. 10, 5

B. 10, 6

C. 11, 5

D. The code will not compile because of line 3.

E. The code will not compile because of line 4.

F. The code contains an infinite loop and does not terminate.

39. What is the output of the following code snippet?

```
3: do {
4: int y = 1;
5: System.out.print(y++ + " ");
6: } while(y <= 10);
```

A. 1 2 3 4 5 6 7 8 9

B. 1 2 3 4 5 6 7 8 9 10

C. 1 2 3 4 5 6 7 8 9 10 11

D. The code will not compile because of line 6.

E. The code contains an infinite loop and does not terminate.

40. What is the output of the following code snippet?

```
3: boolean keepGoing = true;
4: int result = 15, i = 10;
5: do {
6: i--;
7: if(i==8) keepGoing = false;
8: result -= 2;
9: } while(keepGoing);
10: System.out.println(result);
```

A. 7

B. 9

C. 10

D. 11

E. 15

F. The code will not compile because of line 8.

41. What is the output of the following code snippet?

```
3: int count = 0;
4: ROW_LOOP: for(int row = 1; row <=3; row++)
5: for(int col = 1; col <=2; col++) {
6: if(row * col % 2 == 0) continue ROW_LOOP;
7: count++;
8: }
9: System.out.println(count);
```

A. 1

B. 2

C. 3

D. 4

E. 6

F. The code will not compile because of line 6.

42. What is the result of the following code snippet?

```
3: int m = 9, n = 1, x = 0;
4: while(m > n) {
5: m--;
6: n += 2;
7: x += m + n;
8: }
9: System.out.println(x);
```

A. 11

B. 13

C. 23

D. 36

E. 50

F. The code will not compile because of line 7.

43. What is the result of the following code snippet?

```
3: final char a = 'A', d = 'D';
4: char grade = 'B';
5: switch(grade) {
6: case a:
7: case 'B': System.out.print("great");
8: case 'C': System.out.print("good"); break;
9: case d:
10: case 'F': System.out.print("not good");
11: }
```

A. great

B. greatgood

C. The code will not compile because of line 3.

D. The code will not compile because of line 6.

E. The code will not compile because of lines 6 and 9.

44. What is output by the following code? (Choose all that apply)

```
1: public class Fish {
2: public static void main(String[] args) {
3: int numFish = 4;
4: String fishType = "tuna";
5: String anotherFish = numFish + 1;
```

```
6: System.out.println(anotherFish + " " + fishType);
7: System.out.println(numFish + " " + 1);
8: } }
A. 4 1
B. 41
C. 5
D. 5 tuna
E. 5tuna
F. 51tuna
G. The code does not compile.
```

45. Which of the following are output by this code? (Choose all that apply)

```
3: String s = "Hello";
4: String t = new String(s);
5: if ("Hello".equals(s)) System.out.println("one");
6: if (t == s) System.out.println("two");
7: if (t.equals(s)) System.out.println("three");
8: if ("Hello" == s) System.out.println("four");
9: if ("Hello" == t) System.out.println("five");
A. one
B. two
C. three
D. four
E. five
F. The code does not compile.
```

46. Which are true statements? (Choose all that apply)

A. An immutable object can be modified.  
 B. An immutable object cannot be modified.  
 C. An immutable object can be garbage collected.  
 D. An immutable object cannot be garbage collected.  
 E. String is immutable.  
 F. StringBuffer is immutable.  
 G. StringBuilder is immutable.

47. What is the result of the following code?

```
7: StringBuilder sb = new StringBuilder();
8: sb.append("aaa").insert(1, "bb").insert(4, "ccc");
9: System.out.println(sb);
A. abbaaccc
B. abbacccea
C. bbaaaccc
D. bbaacccea
E. An exception is thrown.
F. The code does not compile.
```

48. What is the result of the following code?

```
2: String s1 = "java";
3: StringBuilder s2 = new StringBuilder("java");
4: if (s1 == s2)
5: System.out.print("1");
6: if (s1.equals(s2))
7: System.out.print("2");
A. 1
B. 2
C. 12
D. No output is printed.
E. An exception is thrown.
F. The code does not compile.
```

49. What is the result of the following code?

```
public class Lion {
 public void roar(String roar1, StringBuilder roar2) {
 roar1.concat("!!!");
 roar2.append("!!!");
 }
 public static void main(String[] args) {
 String roar1 = "roar";
 StringBuilder roar2 = new StringBuilder("roar");
 new Lion().roar(roar1, roar2);
 System.out.println(roar1 + " " + roar2);
 } }
A. roar roar
B. roar roar!!!
```

C. roar!!! roar  
 D. roar!!! roar!!!  
 E. An exception is thrown.  
 F. The code does not compile.

50. Which are the results of the following code? (Choose all that apply)

```
String letters = "abcdef";
System.out.println(letters.length());
System.out.println(letters.charAt(3));
System.out.println(letters.charAt(6));
A. 5
B. 6
C. c
D. d
E. An exception is thrown.
F. The code does not compile.
```