

Question 01.

Which of the following are valid Java identifiers?

(Choose all that apply)

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

Question 02.

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.

Question 03.

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.

Question 04.

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

Question 05.

What is the output of the following code?
Choose 1 option.

```
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.

Question 06.

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.

Question 07.

What is the output of the following code snippet?
Choose 1 option.

```
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.

Question 08.

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.

Question 09.

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.

Question 10.

Which are the results of the following code?

(Choose all that apply)

```
String numbers = "012345678";  
System.out.println(numbers.substring(1, 3));  
System.out.println(numbers.substring(7, 7));  
System.out.println(numbers.substring(7));
```

- A. 12
- B. 123
- C. 7
- D. 78
- E. A blank line.
- F. An exception is thrown.
- G. The code does not compile.

Question 11. Which of the following can replace line 4 to print "avaJ"?

(Choose all that apply)

```
3: StringBuilder puzzle = new StringBuilder("Java");  
4: // INSERT CODE HERE  
5: System.out.println(puzzle);  
A. puzzle.reverse();  
B. puzzle.append("vaJ$").substring(0, 4);  
C. puzzle.append("vaJ$").delete(0, 3).deleteCharAt(puzzle.length() - 1);  
D. puzzle.append("vaJ$").delete(0, 3).deleteCharAt(puzzle.length());  
E. None of the above.
```

12. What is the result of the following statements?

```
3: ArrayList<Integer> values = new ArrayList<>();  
4: values.add(4);  
5: values.add(5);  
6: values.set(1, 6);  
7: values.remove(0);  
8: for (Integer v : values) System.out.print(v);
```

- A. 4
- B. 5
- C. 6
- D. 46
- E. 45
- F. An exception is thrown.
- G. The code does not compile.

13. 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.

14. Which of the following can be inserted into the blank to create a date of June 21, 2014? (Choose all that apply)

```
import java.time.*;
public class StartOfSummer {
    public static void main(String[] args) {
        LocalDate date = _____
    }
}
```

- A. new LocalDate(2014, 5, 21);
- B. new LocalDate(2014, 6, 21);
- C. LocalDate.of(2014, 5, 21);
- D. LocalDate.of(2014, 6, 21);
- E. LocalDate.of(2014, Calendar.JUNE, 21);
- F. LocalDate.of(2014, Month.JUNE, 21);

15. Which of the following can be inserted into the blank to create a date June 21, 2014? (Choose all that apply)

```
import java.time.*;
public class StartOfSummer {
    public static void main(String[] args) {
        LocalDate date = _____
    }
}
```

- A. new LocalDate(2014, 5, 21);
- B. new LocalDate(2014, 6, 21);
- C. LocalDate.of(2014, 5, 21);
- D. LocalDate.of(2014, 6, 21);
- E. LocalDate.of(2014, Calendar.JUNE, 21);
- F. LocalDate.of(2014, Month.JUNE, 21);

16. 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.

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

- A. final static void method4() { }
- B. public final int void method() { }
- C. private void int method() { }
- D. static final void method3() { }
- E. void final method() {}
- F. void public method() { }

18. Given the following method, which of the method calls return 2?
(Choose all that apply)

```
public int howMany(boolean b, boolean... b2) {
    return b2.length;
}
```

- A. howMany();
- B. howMany(true);
- C. howMany(true, true);
- D. howMany(true, true, true);
- E. howMany(true, {true});
- F. howMany(true, {true, true});
- G. howMany(true, new boolean[2]);

19. Given the following my.school.ClassRoom and my.city.School class definitions, which line numbers in main() generate a compiler error? (Choose all that apply)

```
1: package my.school;
2: public class Classroom {
3:     private int roomNumber;
4:     protected String teacherName;
5:     static int globalKey = 54321;
6:     public int floor = 3;
7:     Classroom(int r, String t) {
8:         roomNumber = r;
9:         teacherName = t; } }
```

```
1: package my.city;
2: import my.school.*;
3: public class School {
4:     public static void main(String[] args) {
5:         System.out.println(Classroom.globalKey);
6:         Classroom room = new Classroom(101, "Mrs. Anderson");
7:         System.out.println(room.roomNumber);
8:         System.out.println(room.floor);
9:         System.out.println(room.teacherName); } }
```

- A. None, the code compiles fine.
- B. Line 5
- C. Line 6
- D. Line 7
- E. Line 8
- F. Line 9

20. What is the output of the following code?

```

1: package rope;
2: public class Rope {
3:     public static int LENGTH = 5;
4:     static {
5:         LENGTH = 10;
6:     }
7:     public static void swing() {
8:         System.out.print("swing ");
9:     }
10: }
1: import rope.*;
2: import static rope.Rope.*;
3: public class Chimp {
4:     public static void main(String[] args) {
5:         Rope.swing();
6:         new Rope().swing();
7:         System.out.println(LENGTH);
8:     }
9: }

```

A. swing swing 5
B. swing swing 10
C. Compiler error on line 2 of Chimp.
D. Compiler error on line 5 of Chimp.
E. Compiler error on line 6 of Chimp.
F. Compiler error on line 7 of Chimp.

21. Which of the following can replace line 2 to make this code compile?
(Choose all that apply)

```

1: import java.util.*;
2: // INSERT CODE HERE
3: public class Imports {
4:     public void method(ArrayList<String> list) {
5:         sort(list);
6:     }
7: }

```

A. import static java.util.Collections;
B. import static java.util.Collections.*;
C. import static java.util.Collections.sort(ArrayList<String>);
D. static import java.util.Collections;
E. static import java.util.Collections.*;
F. static import java.util.Collections.sort(ArrayList<String>);

22. What is the output of the following code?

```
LocalDate date = LocalDate.of(2018, Month.APRIL, 30);
date.plusDays(2);
date.plusYears(3);
System.out.println(date.getYear() + " " + date.getMonth() + " " + date.getDayOfMonth());
```

- A. 2018 APRIL 2
- B. 2018 APRIL 30
- C. 2018 MAY 2
- D. 2021 APRIL 2
- E. 2021 APRIL 30
- F. 2021 MAY 2
- G. A runtime exception is thrown.

23. What is the result of the following statements?

```
1: public class Test {
2:     public void print(byte x) {
3:         System.out.print("byte");
4:     }
5:     public void print(int x) {
6:         System.out.print("int");
7:     }
8:     public void print(float x) {
9:         System.out.print("float");
10:    }
11:    public void print(Object x) {
12:        System.out.print("Object");
13:    }
14:    public static void main(String[] args) {
15:        Test t = new Test();
16:        short s = 123;
17:        t.print(s);
18:        t.print(true);
19:        t.print(6.789);
20:    }
21: }
```

- A. bytefloatObject
- B. intfloatObject
- C. byteObjectfloat
- D. intObjectfloat
- E. intObjectObject
- F. byteObjectObject

24. Which of the following are true? (Choose 2)

- A. this() can be called from anywhere in a constructor.
- B. this() can be called from any instance method in the class.
- C. this.variableName can be called from any instance method in the class.
- D. this.variableName can be called from any static method in the class.
- E. You must include a default constructor in the code if the compiler does not include one.
- F. You can call the default constructor written by the compiler using this().
- G. You can access a private constructor with the main() method.

25. Which of these classes compile and use a default constructor? (Choose all that apply)

- A. `public class Bird { }`
- B. `public class Bird { public bird() {} }`
- C. `public class Bird { public bird(String name) {} }`
- D. `public class Bird { public Bird() {} }`
- E. `public class Bird { Bird(String name) {} }`
- F. `public class Bird { private Bird(int age) {} }`
- G. `public class Bird { void Bird() { } }`

26. What is the result of the following?

```
1: public class Order {
2:     static String result = "";
3:     { result += "c"; }
4:     static
5:     { result += "u"; }
6:     { result += "r"; }
7: }
1: public class OrderDriver {
2:     public static void main(String[] args) {
3:         System.out.print(Order.result + " ");
4:         System.out.print(Order.result + " ");
5:         new Order();
6:         new Order();
7:         System.out.print(Order.result + " ");
8:     }
9: }
```

- A. curur
- B. ucr cr
- C. u ucr cr
- D. u u cur cur
- E. u u ucr cr
- F. ur ur urc
- G. The code does not compile.

27. Given:

Class A has a reference to an object of class X

Class B is-a A

A calls public instance methods of class Y

B accesses public instance fields of class Z

Which of the following statements are correct?

Select 3 option(s)

- a) Class B has high cohesion.
- b) Level of cohesion of A and B cannot be determined.
- c) Z violates encapsulation.
- d) B violates encapsulation.
- e) A is loosely coupled to Y
- f) B has-a Y

28. Which of the following will compile when inserted in the following code? (Choose all that apply)

```
public class Order3 {
    final String value1 = "1";
    static String value2 = "2";
    String value3 = "3";
    {
        // CODE SNIPPET 1
    }
    static {
        // CODE SNIPPET 2
    }
}
```

- A. value1 = "d"; instead of // CODE SNIPPET 1
- B. value2 = "e"; instead of // CODE SNIPPET 1
- C. value3 = "f"; instead of // CODE SNIPPET 1
- D. value1 = "g"; instead of // CODE SNIPPET 2
- E. value2 = "h"; instead of // CODE SNIPPET 2
- F. value3 = "i"; instead of // CODE SNIPPET 2

29. Which of the following are true about the following code? (Choose all that apply)

```
public class Create {
    Create() {
        System.out.print("1 ");
    }
    Create(int num) {
        System.out.print("2 ");
    }
    Create(Integer num) {
        System.out.print("3 ");
    }
    Create(Object num) {
        System.out.print("4 ");
    }
    Create(int... nums) {
        System.out.print("5 ");
    }
    public static void main(String[] args) {
        new Create(100);
        new Create(1000L);
    }
}
```

- A. The code prints out 2 4.
- B. The code prints out 3 4.
- C. The code prints out 4 2.
- D. The code prints out 4 4.
- E. The code prints 3 4 if you remove the constructor Create(int num).
- F. The code prints 4 4 if you remove the constructor Create(int num).
- G. The code prints 5 4 if you remove the constructor Create(int num).

30. The options below contain the complete contents of a file (the name of the file is not specified). Which of these options can be run with the following command line once compiled?

`java main`

Select 1 option

- A. //in file main.java

```
class main {
    public void main(String[] args) { System.out.println("hello"); } }
```
- B. //in file main.java

```
public static void main4(String[] args) { System.out.println("hello"); }
```
- C. //in file main.java

```
public class anotherone{ }
class main {
    public static void main(String[] args) { System.out.println("hello"); } }
```
- D. //in file main.java

```
class anothermain{
    public static void main(String[] args) { System.out.println("hello2"); } }
class main {
    public final static void main(String[] args) { System.out.println("hello"); } }
```

31. Given the following,

- 1. interface Base {
- 2. boolean m1 ();
- 3. byte m2(short s);
- 4. }

Which code fragments will compile?

(Choose 2 options)

- A. interface Base2 implements Base { }
- B. abstract class Class2 extends Base {

```
public boolean m1() { return true; } }
```
- C. abstract class Class2 implements Base { }
- D. abstract class Class2 implements Base {

```
public boolean m1() { return (true); } }
```
- E. class Class2 implements Base {

```
boolean m1( ) { return false; }
byte m2(short s) { return 42; } }
```

32. Which of the following lambda expressions can fill in the blank?

(Choose all that apply)

```
List<String> list = new ArrayList<>();
list.removeIf(_____);
```

- A. `s -> s.isEmpty()`
- B. `s -> {s.isEmpty()}`
- C. `s -> {s.isEmpty();}`
- D. `s -> {return s.isEmpty();}`
- E. `String s -> s.isEmpty()`
- F. `(String s) -> s.isEmpty()`

33. What is the result of the following class?

```
1: import java.util.function.*;
2:
3: public class Panda {
4:     int age;
5:     public static void main(String[] args) {
6:         Panda p1 = new Panda();
7:         p1.age = 1;
8:         check(p1, p -> p.age < 5);
9:     }
10:    private static void check(Panda panda, Predicate<Panda> pred) {
11:        String result = pred.test(panda) ? "match" : "not match";
12:        System.out.print(result);
13:    } }
```

- A. match
- B. not match
- C. Compiler error on line 8.
- D. Compiler error on line 10.
- E. Compiler error on line 11.
- F. A runtime exception is thrown.

34. What is the result of the following code?

```
1: interface Climb {
2:     boolean isTooHigh(int height, int limit);
3: }
4:
5: public class Climber {
6:     public static void main(String[] args) {
7:         check((h, l) -> h.append(l).isEmpty(), 5);
8:     }
9:     private static void check(Climb climb, int height) {
10:        if (climb.isTooHigh(height, 10))
11:            System.out.println("too high");
12:        else
13:            System.out.println("ok");
14:    }
15: }
```

- A. ok
- B. too high
- C. Compiler error on line 7.
- D. Compiler error on line 10.
- E. Compiler error on a different line.
- F. A runtime exception is thrown.

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

- A. Runtime exceptions are the same thing as checked exceptions.
- B. Runtime exceptions are the same thing as unchecked exceptions.
- C. You can declare only checked exceptions.
- D. You can declare only unchecked exceptions.
- E. You can handle only Exception subclasses.

36. Which lambda can replace the MySecret class to return the same value?
(Choose all that apply)

```
interface Secret {
    String magic(double d);
}
```

```
class MySecret implements Secret {
    public String magic(double d) {
        return "Poof";
    }
}
```

- A. caller((e) -> "Poof");
- B. caller((e) -> {"Poof"});
- C. caller((e) -> { String e = ""; "Poof" });
- D. caller((e) -> { String e = ""; return "Poof"; });
- E. caller((e) -> { String e = ""; return "Poof" });
- F. caller((e) -> { String f = ""; return "Poof"; });

37. What is printed besides the stack trace caused by the NullPointerException from line 16?

```
1: public class DoSomething {
2:     public void go() {
3:         System.out.print("A");
4:         try {
5:             stop();
6:         } catch (ArithmeticException e) {
7:             System.out.print("B");
8:         } finally {
9:             System.out.print("C");
10:        }
11:        System.out.print("D");
12:    }
13:    public void stop() {
14:        System.out.print("E");
15:        Object x = null;
16:        x.toString();
17:        System.out.print("F");
18:    }
19:    public static void main(String[] args) {
20:        new DoSomething().go();
21:    }
22: }
```

- A. AE
- B. AEBCD
- C. AEC
- D. AECD
- E. No output appears other than the stack trace.

38. When are you required to use a finally block in a regular try statement (not a try-with-resources)?

- A. Never.
- B. When the program code doesn't terminate on its own.
- C. When there are no catch blocks in a try statement.
- D. When there is exactly one catch block in a try statement.
- E. When there are two or more catch blocks in a try statement.

39. Which of the following exceptions are thrown by the JVM? (Choose all that apply)

- A. `ArrayIndexOutOfBoundsException`
- B. `ExceptionInInitializerError`
- C. `java.io.IOException`
- D. `NullPointerException`
- E. `NumberFormatException`

40. What is the output of the following snippet, assuming a and b are both 0?

```
3: try {
4:   return a / b;
5: } catch (RuntimeException e) {
6:   return -1;
7: } catch (ArithmeticException e) {
8:   return 0;
9: } finally {
10:  System.out.print("done");
11: }
```

- A. -1
- B. 0
- C. done-1
- D. done0
- E. The code does not compile.
- F. An uncaught exception is thrown.

41. Which of the following can be inserted into Lion to make this code compile? (Choose all that apply)

```
class HasSoreThroatException extends Exception {}
class TiredException extends RuntimeException {}
interface Roar {
    void roar() throws HasSoreThroatException;
}
class Lion implements Roar {
    // INSERT CODE HERE
}
```

- A. `public void roar(){}`
- B. `public void roar() throws Exception{}`
- C. `public void roar() throws HasSoreThroatException{}`
- D. `public void roar() throws IllegalArgumentException{}`
- E. `public void roar() throws TiredException{}`