Sun_CertifyMe_310-065_v2011-01-12_294q_By-Taylor

Exam A

QUESTION 1
Given:

```
1. public class Threads2 implements Runnable {
2.
3.     public void run() {
4.         System.out.println("run.");
5.         throw new RuntimeException("Problem");
6.     }
7.     public static void main(String[] args) {
8.         Thread t = new Thread(new Threads2());
9.         t.start();
10.        System.out.println("End of method.");
11.    }
12.}
```

Which two can be results? (Choose two.)

A. java.lang.RuntimeException: Problem
B. run.
java.lang.RuntimeException: Problem
C. End of method.
java.lang.RuntimeException: Problem
D. End of method.
run.
java.lang.RuntimeException: Problem
E. run.
java.lang.RuntimeException: Problem
End of method.

Answer: DE

QUESTION 2
Which two statements are true? (Choose two.)

A. It is possible for more than two threads to deadlock at once.
B. The JVM implementation guarantees that multiple threads cannot enter into a deadlocked state.
C. Deadlocked threads release once their sleep() method's sleep duration has expired.
D. Deadlocking can occur only when the wait(), notify(), and notifyAll() methods are used incorrectly.
E. It is possible for a single-threaded application to deadlock if synchronized blocks are used incorrectly.
F. If a piece of code is capable of deadlocking, you cannot eliminate the possibility of deadlocking by inserting
invocations of Thread.yield().

Answer: AF

QUESTION 3
Given:

```
void waitForSignal() {
    Object obj = new Object();
    synchronized (Thread.currentThread()) {
        obj.wait();
        obj.notify();
    }
}
```

Which statement is true?

A. This code can throw an InterruptedException.
B. This code can throw an IllegalMonitorStateException.
C. This code can throw a TimeoutException after ten minutes.
D. Reversing the order of obj.wait() and obj.notify() might cause this method to complete normally.
E. A call to notify() or notifyAll() from another thread might cause this method to complete normally.
F. This code does NOT compile unless "obj.wait()" is replaced with "((Thread) obj).wait()".

Answer: B

QUESTION 4
Click the Exhibit button.
What is the output if the main() method is run?

```
1. public class Starter extends Thread {
2.     private int x = 2;
3.     public static void main(String[] args) throws Exception {
4.         new Starter().makeItSo();
5.     }
6.     public Starter(){
7.         x = 5;
8.         start();
9.     }
10.    public void makeItSo() throws Exception {
11.        join();
12.        x = x - 1;
13.        System.out.println(x);
14.    }
15.    public void run() { x *= 2; }
16.}
```

A. 4
B. 5
C. 8
D. 9
E. Compilation fails.
F. An exception is thrown at runtime.
G. It is impossible to determine for certain.

Answer: D

QUESTION 5
Given:

```
1. class PingPong2 {
2.     synchronized void hit(long n) {
3.         for(int i = 1; i < 3; i++)
4.             System.out.print(n + "-" + i + " ");
5.     }
6. }
```

```
1. public class Tester implements Runnable {
2.     static PingPong2 pp2 = new PingPong2();
3.     public static void main(String[] args) {
4.         new Thread(new Tester()).start();
5.         new Thread(new Tester()).start();
```

```
6.      }
7.      public void run() { pp2.hit(Thread.currentThread().getId()); }
8.  }
```

Which statement is true?

A. The output could be 5-1 6-1 6-2 5-2
B. The output could be 6-1 6-2 5-1 5-2
C. The output could be 6-1 5-2 6-2 5-1
D. The output could be 6-1 6-2 5-1 7-1

Answer: B

QUESTION 6
Given:

```
1.  public class Threads4 {
2.      public static void main (String[] args) {
3.          new Threads4().go();
4.      }
5.      public void go() {
6.          Runnable r = new Runnable() {
7.              public void run() {
8.                  System.out.print("foo");
9.              }
10.         };
11.         Thread t = new Thread(r);
12.         t.start();
13.         t.start();
14.     }
15. }
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. The code executes normally and prints "foo".
D. The code executes normally, but nothing is printed.

Answer: B

QUESTION 7
Given:

```
1.  public abstract class Shape {
2.      private int x;
3.      private int y;
4.      public abstract void draw();
5.      public void setAnchor(int x, int y) {
6.          this.x = x;
7.          this.y = y;
8.      }
9.  }
```

Which two classes use the Shape class correctly? (Choose two.)

A.
```
public class Circle implements Shape {
    private int radius;
}
```

B.
```
public abstract class Circle extends Shape {
    private int radius;
}
```
C.
```
public class Circle extends Shape {
    private int radius;
    public void draw();
}
```
D.
```
public abstract class Circle implements Shape {
    private int radius;
    public void draw();
}
```
E.
```
public class Circle extends Shape {
    private int radius;
    public void draw() {/* code here */}
}
```
F.
```
public abstract class Circle implements Shape {
    private int radius;
    public void draw() {/* code here */}
}
```

Answer: BE

QUESTION 8
Given:
```
1. public class Barn {
2.     public static void main(String[] args) {
3.         new Barn().go("hi", 1);
4.         new Barn().go("hi", "world", 2);
5.     }
6.     public void go(String... y, int x) {
7.         System.out.print(y[y.length - 1] + " ");
8.     }
9. }
```
What is the result?

A. hi hi
B. hi world
C. world world
D. Compilation fails.
E. An exception is thrown at runtime.

Answer: D

QUESTION 9
Given:
```
1. class Nav{
2.     public enum Direction { NORTH, SOUTH, EAST, WEST }
3. }
```

```
1. public class Sprite{
2.     //    insert code here
3. }
```
Which code, inserted at line 14, allows the Sprite class to compile?

A. Direction d = NORTH;
B. Nav.Direction d = NORTH;
C. Direction d = Direction.NORTH;

D. Nav.Direction d = Nav.Direction.NORTH;

Answer: D

QUESTION 10
Click the Exhibit button.
Which statement is true about the classes and interfaces in the exhibit?

```
1. public interface A {
2.     public void doSomething(String thing);
3. }
```

```
1. public class AImpl implements A {
2.     public void doSomething(String msg) {}
3. }
```

```
1. public class B {
2.     public A doit(){
3.         //more code here
4.     }
5.     public String execute(){
6.         //more code here
7.     }
8. }
```

```
1. public class C extends B {
2.     public AImpl doit(){
3.         //more code here
4.     }
5.
6.     public Object execute() {
7.         //more code here
8.     }
9. }
```

A. Compilation will succeed for all classes and interfaces.
B. Compilation of class C will fail because of an error in line 2.
C. Compilation of class C will fail because of an error in line 6.
D. Compilation of class AImpl will fail because of an error in line 2.

Answer: C

QUESTION 11
Click the Exhibit button.
What is the result?

```
11. public class Person {
12.     String name = "No name";
13.     public Person(String nm) { name = nm; }
14. }
15.
16. public class Employee extends Person {
17.     String empID = "0000";
18.     public Employee(String id) { empID = id; }
19. }
20.
21. public class EmployeeTest {
22.     public static void main(String[] args){
23.         Employee e = new Employee("4321");
24.         System.out.println(e.empID);
```

```
25.     }
26. }
```

A. 4321
B. 0000
C. An exception is thrown at runtime.
D. Compilation fails because of an error in line 18.

Answer: D

QUESTION 12
Given:

```
1. public class Rainbow {
2.     public enum MyColor {
3.         RED(0xff0000), GREEN(0x00ff00), BLUE(0x0000ff);
4.         private final int rgb;
5.         MyColor(int rgb) { this.rgb = rgb; }
6.         public int getRGB() { return rgb; }
7.     };
8.     public static void main(String[] args) {
9.         //insert code here
10.    }
11.}
```

Which code fragment, inserted at line 19, allows the Rainbow class to compile?

A. `MyColor skyColor = BLUE;`
B. `MyColor treeColor = MyColor.GREEN;`
C. `if(RED.getRGB() < BLUE.getRGB()) { }`
D. Compilation fails due to other error(s) in the code.
E. `MyColor purple = new MyColor(0xff00ff);`
F. `MyColor purple = MyColor.BLUE + MyColor.RED;`

Answer: B

QUESTION 13
Given:

```
1. public class Mud {
2.     //insert code here
3.         System.out.println("hi");
4.     }
5. }
```

And the following five fragments:

```
public static void main(String...a) {
public static void main(String.* a) {
public static void main(String... a) {
public static void main(String[]... a) {
public static void main(String...[] a) {
```

How many of the code fragments, inserted independently at line 2, compile?

A. 0
B. 1
C. 2

D. 3
E. 4
F. 5

Answer: D

QUESTION 14
Given:

```
1. class Atom {
2.     Atom() { System.out.print("atom "); }
3. }
4. class Rock extends Atom {
5.     Rock(String type) { System.out.print(type); }
6. }
7. public class Mountain extends Rock {
8.     Mountain() {
9.         super("granite ");
10.        new Rock("granite ");
11.    }
12.    public static void main(String[] a) { new Mountain(); }
13.}
```

What is the result?

A. Compilation fails.
B. atom granite
C. granite granite
D. atom granite granite
E. An exception is thrown at runtime.
F. atom granite atom granite

Answer: F

QUESTION 15
Given:

```
interface TestA { String toString(); }

public class Test {
    public static void main(String[] args) {
        System.out.println(new TestA() {
            public String toString() { return "test"; }
        });
    }
}
```

What is the result?

A. test
B. null
C. An exception is thrown at runtime.
D. Compilation fails because of an error in line 1.
E. Compilation fails because of an error in line 4.
F. Compilation fails because of an error in line 5.

Answer: A

QUESTION 16
Given:

```
1.      public static void parse(String str) {
2.          try {
3.              float f = Float.parseFloat(str);
4.          } catch (NumberFormatException nfe) {
5.              f = 0;
6.          } finally {
7.              System.out.println(f);
8.          }
9.      }
10.     public static void main(String[] args) {
11.         parse("invalid");
12.     }
```

What is the result?

A. 0.0
B. Compilation fails.
C. A ParseException is thrown by the parse method at runtime.
D. A NumberFormatException is thrown by the parse method at runtime.

Answer: B

QUESTION 17
Given:

```
1. public class Blip {
2.     protected int blipvert(int x) { return 0; }
3. }
4. class Vert extends Blip {
5.     //    insert code here
6. }
```

Which five methods, inserted independently at line 5, will compile? (Choose five.)

A. `public int blipvert(int x) { return 0; }`
B. `private int blipvert(int x) { return 0; }`
C. `private int blipvert(long x) { return 0; }`
D. `protected long blipvert(int x) { return 0; }`
E. `protected int blipvert(long x) { return 0; }`
F. `protected long blipvert(long x) { return 0; }`
G. `protected long blipvert(int x, int y) { return 0; }`

Answer: ACEFG

QUESTION 18
Given:

```
1. class Super {
2.     private int a;
3.     protected Super(int a) { this.a = a; }
4. }

11. class Sub extends Super {
12.     public Sub(int a) { super(a); }
13.     public Sub() { this.a = 5; }
14. }
```

Which two, independently, will allow Sub to compile? (Choose two.)

A. Change line 2 to:
public int a;
B. Change line 2 to:
protected int a;
C. Change line 13 to:
public Sub() { this(5); }
D. Change line 13 to:
public Sub() { super(5); }
E. Change line 13 to:
public Sub() { super(a); }

Answer: CD

QUESTION 19
Which Man class properly represents the relationship "Man has a best friend who is a Dog"?

A. `class Man extends Dog { }`
B. `class Man implements Dog { }`
C. `class Man { private BestFriend dog; }`
D. `class Man { private Dog bestFriend; }`
E. `class Man { private Dog<bestFriend>; }`
F. `class Man { private BestFriend<dog>; }`

Answer: D

QUESTION 20
Given:

```
1. package test;
2.
3. class Target {
4.     public String name = "hello";
5. }
```

What can directly access and change the value of the variable name?

A. any class
B. only the Target class
C. any class in the test package
D. any class that extends Target

Answer: C

QUESTION 21
Given:

```
11. abstract class Vehicle { public int speed() { return 0; }
12. class Car extends Vehicle { public int speed() { return 60; }
13. class RaceCar extends Car { public int speed() { return 150; } ...

21.    RaceCar racer = new RaceCar();
22.    Car car = new RaceCar();
23     Vehicle vehicle = new RaceCar();
24     System.out.println(racer.speed() + ", " + car.speed() + ", " + vehicle.
speed());
```

What is the result?

A. 0, 0, 0
B. 150, 60, 0
C. Compilation fails.
D. 150, 150, 150
E. An exception is thrown at runtime.

Answer: D

QUESTION 22
Given:

```
5. class Building { }
6. public class Barn extends Building {
7.    public static void main(String[] args) {
8.        Building build1 = new Building();
9.        Barn barn1 = new Barn();
10.       Barn barn2 = (Barn) build1;
11.       Object obj1 = (Object) build1;
12.       String str1 = (String) build1;
13.       Building build2 = (Building) barn1;
14.   }
15. }
```

Which is true?

A. If line 10 is removed, the compilation succeeds.
B. If line 11 is removed, the compilation succeeds.
C. If line 12 is removed, the compilation succeeds.
D. If line 13 is removed, the compilation succeeds.
E. More than one line must be removed for compilation to succeed.

Answer: C

QUESTION 23
A team of programmers is reviewing a proposed API for a new utility class. After some discussion, they realize that they can reduce the number of methods in the API without losing any functionality. If they implement the new design, which two OO principles will they be promoting?

A. Looser coupling
B. Tighter coupling
C. Lower cohesion
D. Higher cohesion
E. Weaker encapsulation
F. Stronger encapsulation

Answer: A

QUESTION 24
Given:

```
21. class Money {
22.    private String country = "Canada";
23.    public String getC() { return country; }
24. }
```

```
25. class Yen extends Money {
26.    public String getC() { return super.country; }
27. }
28. public class Euro extends Money {
29.    public String getC(int x) { return super.getC(); }
30.    public static void main(String[] args) {
31.        System.out.print(new Yen().getC() + " " + new Euro().getC());
32.    }
33. }
```

What is the result?

A. Canada
B. null Canada
C. Canada null
D. Canada Canada
E. Compilation fails due to an error on line 26.
F. Compilation fails due to an error on line 29.

Answer: E

QUESTION 25
Assuming that the serializeBanana() and the deserializeBanana() methods will correctly use Java serialization and given:

```
13. import java.io.*;
14. class Food implements Serializable {int good = 3;}
15. class Fruit extends Food {int juice = 5;}
16. public class Banana extends Fruit {
17.    int yellow = 4;
18.    public static void main(String [] args) {
19.        Banana b = new Banana(); Banana b2 = new Banana();
20.        b.serializeBanana(b); // assume correct serialization
21.        b2 = b.deserializeBanana(); // assume correct
22.        System.out.println("restore "+b2.yellow+ b2.juice+b2.good);
24.    }
25. //    more Banana methods go here
50. }
```

What is the result?

A. restore 400
B. restore 403
C. restore 453
D. Compilation fails.
E. An exception is thrown at runtime.

Answer: C

QUESTION 26
Given a valid DateFormat object named df, and

```
16. Date d = new Date(0L);
17. String ds = "December 15, 2004";
18. //insert code here
```

What updates d's value with the date represented by ds?

A. `18. d = df.parse(ds);`

B.
```
18. d = df.getDate(ds);
```
C.
```
18. try {
19. d = df.parse(ds);
20. } catch(ParseException e) { };
```
D.
```
18. try {
19. d = df.getDate(ds);
20. } catch(ParseException e) { };
```

Answer: C

QUESTION 27
Given:
```
11. double input = 314159.26;
12. NumberFormat nf = NumberFormat.getInstance(Locale.ITALIAN);
13. String b;
14. //insert code here
```
Which code, inserted at line 14, sets the value of b to 314.159,26?

A. `b = nf.parse( input );`
B. `b = nf.format( input );`
C. `b = nf.equals( input );`
D. `b = nf.parseObject( input );`

Answer: B

QUESTION 28
Given:
```
1. public class TestString1 {
2.     public static void main(String[] args) {
3.         String str = "420";
4.         str += 42;
5.         System.out.print(str);
6.     }
7. }
```
What is the output?

A. 42
B. 420
C. 462
D. 42042
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: D

QUESTION 29
Which capability exists only in java.io.FileWriter?

A. Closing an open stream.
B. Flushing an open stream.
C. Writing to an open stream.
D. Writing a line separator to an open stream.

Answer: D

QUESTION 30
Given that the current directory is empty, and that the user has read and write permissions, and the following:

```
1. import java.io.*;
2. public class DOS {
3.     public static void main(String[] args) {
4.         File dir = new File("dir");
5.         dir.mkdir();
6.         File f1 = new File(dir, "f1.txt");
7.         try {
8.             f1.createNewFile();
9.         } catch (IOException e) { ; }
10.        File newDir = new File("newDir");
11.        dir.renameTo(newDir);
12.    }
13.}
```

Which statement is true?

A. Compilation fails.
B. The file system has a new empty directory named dir.
C. The file system has a new empty directory named newDir.
D. The file system has a directory named dir, containing a file f1.txt.
E. The file system has a directory named newDir, containing a file f1.txt.

Answer: E

QUESTION 31
Given:

```
static void test() throws RuntimeException {
    try {
        System.out.print("test ");
        throw new RuntimeException();
    }
    catch (Exception ex) { System.out.print("exception "); }
}
public static void main(String[] args) {
    try { test(); }
    catch (RuntimeException ex) { System.out.print("runtime "); }
    System.out.print("end ");
}
```

What is the result?

A. test end
B. Compilation fails.
C. test runtime end
D. test exception end
E. A Throwable is thrown by main at runtime.

Answer: D

QUESTION 32
Given:

```
1. public class Score implements Comparable<Score> {
2.     private int wins, losses;
3.     public Score(int w, int l) { wins = w; losses = l; }
4.     public int getWins() { return wins; }
5.     public int getLosses() { return losses; }
```

```
6.      public String toString() {
7.          return "<" + wins + "," + losses + ">";
8.      }
9.  //    insert code here
10. }
11.
```

Which method will complete this class?

A. public int compareTo(Object o){/*more code here*/}
B. public int compareTo(Score other){/*more code here*/}
C. public int compare(Score s1,Score s2){/*more code here*/}
D. public int compare(Object o1,Object o2){/*more code here*/}

Answer: B

Exam B

QUESTION 1
Given:
```
22. StringBuilder sb1 = new StringBuilder("123");
23. String s1 = "123";
24. // insert code here
25. System.out.println(sb1 + " " + s1);
```
Which code fragment, inserted at line 24, outputs "123abc 123abc"?

A. `sb1.append("abc"); s1.append("abc");`
B. `sb1.append("abc"); s1.concat("abc");`
C. `sb1.concat("abc"); s1.append("abc");`
D. `sb1.concat("abc"); s1.concat("abc");`
E. `sb1.append("abc"); s1 = s1.concat("abc");`
F. `sb1.concat("abc"); s1 = s1.concat("abc");`
G. `sb1.append("abc"); s1 = s1 + s1.concat("abc");`
H. `sb1.concat("abc"); s1 = s1 + s1.concat("abc");`

Answer: E

QUESTION 2
Click the Exhibit button.
Which code, inserted at line 14, will allow this class to correctly serialize and deserialize?

```
1. import java.io.*;
2. public class Foo implements Serializable {
3.     public int x, y;
4.     public Foo(int x, int y){
5.         this.x = x; this.y = y;
6.     }
7.
8.     private void writeObject(ObjectOutputStream s)
9.         throws IOException{
10.        s.writeInt(x); s.writeInt(y);
11.    }
12.
13.    private void readObject(ObjectInputStream s)
14.        throws IOException, ClassNotFoundException {
15.        //insert code here
16.    }
17. }
```

A. `s.defaultReadObject();`
B. `this = s.defaultReadObject();`
C. `y = s.readInt(); x = s.readInt();`
D. `x = s.readInt(); y = s.readInt();`

Answer: D

QUESTION 3
Given:
```
1. public class LineUp {
2.     public static void main(String[] args) {
3.         double d = 12.345;
```

```
4. //        insert code here
5.     }
6. }
```
Which code fragment, inserted at line 4, produces the output | 12.345|?

A. `System.out.printf("|%7d| \n", d);`
B. `System.out.printf("|%7f| \n", d);`
C. `System.out.printf("|%3.7d| \n", d);`
D. `System.out.printf("|%3.7f| \n", d);`
E. `System.out.printf("|%7.3d| \n", d);`
F. `System.out.printf("|%7.3f| \n", d);`

Answer: F

QUESTION 4
Given:

```
11. public class Test {
12.    public static void main(String [] args) {
13.        int x = 5;
14.        boolean b1 = true;
15.        boolean b2 = false;
16.
17.        if ((x == 4) && !b2 )
18.            System.out.print("1 ");
19.        System.out.print("2 ");
20.        if ((b2 = true) && b1 )
21.            System.out.print("3 ");
22.    }
23. }
```

What is the result?

A. 2
B. 3
C. 1 2
D. 2 3
E. 1 2 3
F. Compilation fails.
G. An exception is thrown at runtime.

Answer: D

QUESTION 5
Given:

```
interface Foo {}
class Alpha implements Foo {}
class Beta extends Alpha {}
class Delta extends Beta {
    public static void main( String[] args ) {
        Beta x = new Beta();
16.  //insert code here 16
    }
}
```
Which code, inserted at line 16, will cause a java.lang.ClassCastException?

A. `Alpha a = x;`
B. `Foo f = (Delta)x;`

C. `Foo f = (Alpha)x;`
D. `Beta b = (Beta)(Alpha)x;`

Answer: B

QUESTION 6
Given:
```
    public void go() {
        String o = "";
        z:
            for(int x = 0; x < 3; x++) {
                for(int y = 0; y < 2; y++) {
                    if(x==1) break;
                    if(x==2 && y==1) break z;
                    o = o + x + y;
                }
            }
        System.out.println(o);
    }
```
What is the result when the go() method is invoked?

A. 00
B. 0001
C. 000120
D. 00012021
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: C

QUESTION 7
Given:
```
static void test() throws RuntimeException {
    try {
        System.out.print("test ");
        throw new RuntimeException();
    }
    catch (Exception ex) { System.out.print("exception "); }
}
public static void main(String[] args) {
    try { test(); }
    catch (RuntimeException ex) { System.out.print("runtime "); }
    System.out.print("end ");
}
```
What is the result?

A. test end
B. Compilation fails.
C. test runtime end
D. test exception end
E. A Throwable is thrown by main at runtime.

Answer: D

QUESTION 8
Given:
```
try {
```

```
 //some code here line 34
} catch (NullPointerException e1) {
    System.out.print("a");
} catch (Exception e2) {
    System.out.print("b");
} finally {
    System.out.print("c");
}
```
If some sort of exception is thrown at line 34, which output is possible?

A. a
B. b
C. c
D. ac
E. abc

Answer: D

QUESTION 9
Given:
```
 //some code here line 31
try {
 //some code here line 33
} catch (NullPointerException e1) {
 //some code here line 35
} finally {
 //some code here line 37
}
```

Under which three circumstances will the code on line 37 be executed? (Choose three.)

A. The instance gets garbage collected.
B. The code on line 33 throws an exception.
C. The code on line 35 throws an exception.
D. The code on line 31 throws an exception.
E. The code on line 33 executes successfully.

Answer: BCE

QUESTION 10
Given:
```
int x = 0;
int y = 10;
do {
    y--;
    ++x;
} while (x < 5);
System.out.print(x + "," + y);
```
What is the result?

A. 5,6
B. 5,5
C. 6,5
D. 6,6

Answer: B

QUESTION 11
Given:

```
public class Donkey2 {
    public static void main(String[] args) {
        boolean assertsOn = true;
        assert (assertsOn) : assertsOn = true;
        if(assertsOn) {
            System.out.println("assert is on");
        }
    }
}
```

If class Donkey is invoked twice, the first time without assertions enabled, and the second time with assertions enabled, what are the results?

A. no output
B. no output
   assert is on
C. assert is on
D. no output
   An AssertionError is thrown.
E. assert is on
   An AssertionError is thrown.

Answer: C

QUESTION 12
Click the Exhibit button.
Given:

```
public void method() {
    A a = new A();
    a.method1();
}
```

Which statement is true if a TestException is thrown on line 3 of class B?

```
1. public class A{
2.     public void method1() {
3.         try {
4.             B b = new B();
5.             b.method2();
6.             //more code here
7.         } catch (TestException te){
8.             throw new RuntimeException(te);
9.         }
10.    }
11.}
```

```
1. public class B{
2.     public void method2() throws TestException {
3.         //more code here
4.     }
5. }
```

```
1. class TestException extends Exception {
2. }
```

A. Line 33 must be called within a try block.
B. The exception thrown by method1 in class A is not required to be caught.
C. The method declared on line 31 must be declared to throw a RuntimeException.

D. On line 5 of class A, the call to method2 of class B does not need to be placed in a try/catch block.

Answer: B

QUESTION 13
Given:
```
Float pi = new Float(3.14f);
if (pi > 3) {
    System.out.print("pi is bigger than 3. ");
}
else {
    System.out.print("pi is not bigger than 3. ");
}
finally {
    System.out.println("Have a nice day.");
}
```
What is the result?

A. Compilation fails.
B. pi is bigger than 3.
C. An exception occurs at runtime.
D. pi is bigger than 3. Have a nice day.
E. pi is not bigger than 3. Have a nice day.

Answer: A

QUESTION 14
Given:
```
1. public class Boxer1{
2.     Integer i;
3.     int x;
4.     public Boxer1(int y) {
5.         x = i+y;
6.         System.out.println(x);
7.     }
8.     public static void main(String[] args) {
9.         new Boxer1(new Integer(4));
10.    }
11.}
```
What is the result?

A. The value "4" is printed at the command line.
B. Compilation fails because of an error in line 5.
C. Compilation fails because of an error in line 9.
D. A NullPointerException occurs at runtime.
E. A NumberFormatException occurs at runtime.
F. An IllegalStateException occurs at runtime.

Answer: D

QUESTION 15
Given:
```
1. public class Person {
2.     private String name;
3.     public Person(String name) { this.name = name; }
4.     public boolean equals(Person p) {
```

```
5.          return p.name.equals(this.name);
6.      }
7.  }
```
Which statement is true?

A. The equals method does NOT properly override the Object.equals method.
B. Compilation fails because the private attribute p.name cannot be accessed in line 5.
C. To work correctly with hash-based data structures, this class must also implement the hashCode method.
D. When adding Person objects to a java.util.Set collection, the equals method in line 4 will prevent duplicates.

Answer: A

QUESTION 16
Which two statements are true about the hashCode method? (Choose two.)

A. The hashCode method for a given class can be used to test for object equality and object inequality for that class.
B. The hashCode method is used by the java.util.SortedSet collection class to order the elements within that set.
C. The hashCode method for a given class can be used to test for object inequality, but NOT object equality, for that class.
D. The only important characteristic of the values returned by a hashCode method is that the distribution of values must follow a Gaussian distribution.
E. The hashCode method is used by the java.util.HashSet collection class to group the elements within that set into hash buckets for swift retrieval.

Answer: CE

QUESTION 17
Given:
```
1.  public class Score implements Comparable<Score> {
2.      private int wins, losses;
3.      public Score(int w, int l) { wins = w; losses = l; }
4.      public int getWins() { return wins; }
5.      public int getLosses() { return losses; }
6.      public String toString() {
7.          return "<" + wins + "," + losses + ">";
8.      }
9.  //    insert code here
10. }
11.
```
Which method will complete this class?

A. public int compareTo(Object o){/*more code here*/}
B. public int compareTo(Score other){/*more code here*/}
C. public int compare(Score s1,Score s2){/*more code here*/}
D. public int compare(Object o1,Object o2){/*more code here*/}

Answer: B

QUESTION 18
Given a pre-generics implementation of a method:
```
11. public static int sum(List list) {
12.     int sum = 0;
```

```
13.    for ( Iterator iter = list.iterator(); iter.hasNext(); ) {
14.        int i = ((Integer)iter.next()).intValue();
15.        sum += i;
16.    }
17.    return sum;
18. }
```
What three changes allow the class to be used with generics and avoid an unchecked warning? (Choose three.)

A. Remove line 14.
B. Replace line 14 with "int i = iter.next();".
C. Replace line 13 with "for (int i : intList) {".
D. Replace line 13 with "for (Iterator iter : intList) {".
E. Replace the method declaration with "sum(List<int> intList)".
F. Replace the method declaration with "sum(List<Integer> intList)".

Answer: ACF

QUESTION 19
Given:
```
23. Object [] myObjects = {
24.        new Integer(12),
25.        new String("foo"),
26.        new Integer(5),
27.        new Boolean(true)
28. };
29. Arrays.sort(myObjects);
30. for(int i=0; i<myObjects.length; i++) {
31.    System.out.print(myObjects[i].toString());
32.    System.out.print(" ");
33. }
```
What is the result?

A. Compilation fails due to an error in line 23.
B. Compilation fails due to an error in line 29.
C. A ClassCastException occurs in line 29.
D. A ClassCastException occurs in line 31.
E. The value of all four objects prints in natural order.

Answer: C

QUESTION 20
Given a class Repetition:
```
1. package utils;
2.
3. public class Repetition {
4. public static String twice(String s) { return s + s; }
5. }
```
and given another class Demo:
```
1. public class Demo {
2.     public static void main(String[] args) {
3.         System.out.println(twice("pizza"));
4.     }
5. }
```
Which code should be inserted at line 1 of Demo.java to compile and run Demo to print "pizzapizza"?

A. `import utils.*;`
B. `static import utils.*;`

C. `import utils.Repetition.*;`
D. `static import utils.Repetition.*;`
E. `import utils.Repetition.twice();`
F. `import static utils.Repetition.twice;`
G. `static import utils.Repetition.twice;`

Answer: F

QUESTION 21
A UNIX user named Bob wants to replace his chess program with a new one, but he is not sure where the old one is installed. Bob is currently able to run a Java chess program starting from his home directory / home/bob using the command:

```
java -classpath /test:/home/bob/downloads/*.jar games.Chess
```

Bob's CLASSPATH is set (at login time) to:

```
/usr/lib:/home/bob/classes:/opt/java/lib:/opt/java/lib/*.jar
```

What is a possible location for the Chess.class file?

A. /test/Chess.class
B. /home/bob/Chess.class
C. /test/games/Chess.class
D. /usr/lib/games/Chess.class
E. /home/bob/games/Chess.class
F. inside jarfile /opt/java/lib/Games.jar (with a correct manifest)
G. inside jarfile /home/bob/downloads/Games.jar (with a correct manifest)

Answer: C

QUESTION 22
Given the following directory structure:

```
bigProject
|--source
| |--Utils.java
|
|--classes
|--
```

And the following command line invocation:

```
javac -d classes source/Utils.java
```

Assume the current directory is bigProject, what is the result?

A. If the compile is successful, Utils.class is added to the source directory.
B. The compiler returns an invalid flag error.
C. If the compile is successful, Utils.class is added to the classes directory.
D. If the compile is successful, Utils.class is added to the bigProject directory.

Answer: C

QUESTION 23
Given:

```
1. package com.company.application;
2.
3. public class MainClass {
```

```
4.      public static void main(String[] args) {}
5.  }
```
And MainClass exists in the /apps/com/company/application directory. Assume the CLASSPATH environment variable is set to "." (current directory).Which two java commands entered at the command line will run MainClass? (Choose two.)

A. java MainClass if run from the /apps directory
B. java com.company.application.MainClass if run from the /apps directory
C. java -classpath /apps com.company.application.MainClass if run from any directory
D. java -classpath . MainClass if run from the /apps/com/company/application directory
E. java -classpath /apps/com/company/application:. MainClass if run from the /apps directory
F. java com.company.application.MainClass if run from the /apps/com/company/application directory

Answer: BC

QUESTION 24
Which statement is true?

A. A class's finalize() method CANNOT be invoked explicitly.
B. super.finalize() is called implicitly by any overriding finalize() method.
C. The finalize() method for a given object is called no more than once by the garbage collector.
D. The order in which finalize() is called on two objects is based on the order in which the two objects became finalizable.

Answer: C

QUESTION 25
Given:
```
1.  public class Batman {
2.      int squares = 81;
3.      public static void main(String[] args) {
4.          new Batman().go();
5.      }
6.      void go() {
7.          incr(++squares);
8.          System.out.println(squares);
9.      }
10.     void incr(int squares) { squares += 10; }
11. }
```
What is the result?

A. 81
B. 82
C. 91
D. 92
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: B

QUESTION 26
Given:
```
public class Yippee {
    public static void main(String [] args) {
        for(int x = 1; x < args.length; x++) {
```

```
            System.out.print(args[x] + " ");
        }
    }
}
```

and two separate command line invocations:

```
java Yippee
java Yippee 1 2 3 4
```

What is the result?

A. No output is produced.
   1 2 3
B. No output is produced.
   2 3 4
C. No output is produced.
   1 2 3 4
D. An exception is thrown at runtime.
   1 2 3
E. An exception is thrown at runtime.
   2 3 4
F. An exception is thrown at runtime.
   1 2 3 4

Answer: B

QUESTION 27
Given:

```
1. public class Pass {
2.     public static void main(String [] args) {
3.         int x = 5;
4.         Pass p = new Pass();
5.         p.doStuff(x);
6.         System.out.print(" main x = " + x);
7.     }
8.
9.     void doStuff(int x) {
10.        System.out.print(" doStuff x = " + x++);
11.    }
12.}
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. doStuff x = 6 main x = 6
D. doStuff x = 5 main x = 5
E. doStuff x = 5 main x = 6
F. doStuff x = 6 main x = 5

Answer: D

QUESTION 28
Given:

```
1. interface Animal { void makeNoise(); }
2. class Horse implements Animal {
3.     Long weight = 1200L;
```

```
4.     public void makeNoise() { System.out.println("whinny"); }
5. }
6.
7. public class Icelandic extends Horse {
8.     public void makeNoise() { System.out.println("vinny"); }
9.     public static void main(String[] args) {
10.        Icelandic i1 = new Icelandic();
11.        Icelandic i2 = new Icelandic();
12.        Icelandic i3 = new Icelandic();
13.        i3 = i1; i1 = i2; i2 = null; i3 = i1;
14.    }
15.}
```

When line 14 is reached, how many objects are eligible for the garbage collector?

A. 0
B. 1
C. 2
D. 3
E. 4
F. 6

Answer: E

QUESTION 29

Given two files, GrizzlyBear.java and Salmon.java:

```
1. package animals.mammals;
2.
3. public class GrizzlyBear extends Bear {
4. void hunt() {
5. Salmon s = findSalmon();
6. s.consume();
7. }
8. }
```

```
1. package animals.fish;
2.
3. public class Salmon extends Fish {
4. public void consume() { /* do stuff */ }
5. }
```

If both classes are in the correct directories for their packages, and the Mammal class correctly defines the findSalmon() method, which change allows this code to compile?

A. add import animals.mammals.*; at line 2 in Salmon.java
B. add import animals.fish.*; at line 2 in GrizzlyBear.java
C. add import animals.fish.Salmon.*; at line 2 in GrizzlyBear.java
D. add import animals.mammals.GrizzlyBear.*; at line 2 in Salmon.java B

Answer: B

QUESTION 30

Given:

```
String[] elements = { "for", "tea", "too" };
String first = (elements.length > 0) ? elements[0] : null;
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. The variable first is set to null.
D. The variable first is set to elements[0].

Answer: D

QUESTION 31

Answer:

QUESTION 32

Answer:

Exam C

QUESTION 1
A company has a business application that provides its users with many different reports: receivables reports, payables reports, revenue projects, and so on. The company has just purchased some new, state-of-the-art, wireless printers, and a programmer has been assigned the task of enhancing all of the reports to use not only the company's old printers, but the new wireless printers as well. When the programmer starts looking into the application, the programmer discovers that because of the design of the application, it is necessary to make changes to each report to support the new printers.Which two design concepts most likely explain this situation? (Choose two.)

A. Inheritance
B. Low cohesion
C. Tight coupling
D. High cohesion
E. Loose coupling
F. Object immutability

Answer: BC

QUESTION 2
Given:
```
10. public class SuperCalc {
11.     protected static int multiply(int a, int b) { return a * b;}
12. }
and:
20.     public class SubCalc extends SuperCalc{
21.     public static int multiply(int a, int b) {
22.         int c = super.multiply(a, b);
23.         return c;
24.     }
25. }
and:
30.     SubCalc sc = new SubCalc ();
31. System.out.println(sc.multiply(3,4));
32. System.out.println(SubCalc.multiply(2,2));
```

What is the result?

A. 12
B. The code runs with no output.
C. An exception is thrown at runtime.
D. Compilation fails because of an error in line 21.
E. Compilation fails because of an error in line 22.
F. Compilation fails because of an error in line 31.

Answer: E

QUESTION 3
Given:
```
class Foo {
    public int a = 3;
    public void addFive() { a += 5; System.out.print("f "); }
}
class Bar extends Foo {
    public int a = 8;
    public void addFive() { this.a += 5; System.out.print("b " ); }
}
```

Invoked with:

```
Foo f = new Bar();
f.addFive();
System.out.println(f.a);
```

What is the result?

A. b 3
B. b 8
C. b 13
D. f 3
E. f 8
F. f 13
G. Compilation fails.
H. An exception is thrown at runtime.

Answer: A

QUESTION 4
A company that makes Computer Assisted Design (CAD) software has, within its application, some utility classes that are used to perform 3D rendering tasks. The company's chief scientist has just improved the performance of one of the utility classes' key rendering algorithms, and has assigned a programmer to replace the old algorithm with the new algorithm. When the programmer begins researching the utility classes, she is happy to discover that the algorithm to be replaced exists in only one class. The programmer reviews that class's API, and replaces the old algorithm with the new algorithm, being careful that her changes adhere strictly to the class's API. Once testing has begun, the programmer discovers that other classes that use the class she changed are no longer working properly. What design flaw is most likely the cause of these new bugs?

A. Inheritance
B. Tight coupling
C. Low cohesion
D. High cohesion
E. Loose coupling
F. Object immutability

Answer: B

QUESTION 5
Given:

```
1. class ClassA {
2.     public int numberOfInstances;
3.     protected ClassA(int numberOfInstances) {
4.         this.numberOfInstances = numberOfInstances;
5.     }
6. }
7. public class ExtendedA extends ClassA {
8.     private ExtendedA(int numberOfInstances) {
9.         super(numberOfInstances);
10.    }
11.    public static void main(String[] args) {
12.        ExtendedA ext = new ExtendedA(420);
13.        System.out.print(ext.numberOfInstances);
14.    }
15.}
```

Which statement is true?

A. 420 is the output.
B. An exception is thrown at runtime.
C. All constructors must be declared public.
D. Constructors CANNOT use the private modifier.
E. Constructors CANNOT use the protected modifier.

Answer: A

QUESTION 6
Given:
```
class ClassA {}
class ClassB extends ClassA {}
class ClassC extends ClassA {}
```
and:
```
ClassA p0 = new ClassA();
ClassB p1 = new ClassB();
ClassC p2 = new ClassC();
ClassA p3 = new ClassB();
ClassA p4 = new ClassC();
```

Which three are valid? (Choose three.)

A. `p0 = p1;`
B. `p1 = p2;`
C. `p2 = p4;`
D. `p2 = (ClassC)p1;`
E. `p1 = (ClassB)p3;`
F. `p2 = (ClassC)p4;`

Answer: AEF

QUESTION 7
Given:
```
class Thingy { Meter m = new Meter(); }
class Component { void go() { System.out.print("c"); } }
class Meter extends Component { void go() { System.out.print("m"); } } 8.
class DeluxeThingy extends Thingy {
    public static void main(String[] args) {
        DeluxeThingy dt = new DeluxeThingy();
        dt.m.go();
        Thingy t = new DeluxeThingy();
        t.m.go();
    }
}
```
Which two are true? (Choose two.)

A. The output is mm.
B. The output is mc.
C. Component is-a Meter.
D. Component has-a Meter.
E. DeluxeThingy is-a Component.
F. DeluxeThingy has-a Component.

Answer: AF

QUESTION 8
Given:

```
10. interface Jumper { public void jump(); }
...
20. class Animal {}
...
30. class Dog extends Animal {
31. Tail tail;
32. }
...
40. class Beagle extends Dog implements Jumper{
41. public void jump() {}
42. }
...
50. class Cat implements Jumper{
51.     public void jump() {}
52. }
```

Which three are true? (Choose three.)

A. Cat is-a Animal
B. Cat is-a Jumper
C. Dog is-a Animal
D. Dog is-a Jumper
E. Cat has-a Animal
F. Beagle has-a Tail
G. Beagle has-a Jumper

Answer: BCF

QUESTION 9
Given:

```
1. import java.util.*;
2. public class WrappedString {
3.     private String s;
4.     public WrappedString(String s) { this.s = s; }
5.     public static void main(String[] args) {
6.         HashSet<Object> hs = new HashSet<Object>();
7.         WrappedString ws1 = new WrappedString("aardvark");
8.         WrappedString ws2 = new WrappedString("aardvark");
9.         String s1 = new String("aardvark");
10.        String s2 = new String("aardvark");
11.        hs.add(ws1); hs.add(ws2); hs.add(s1); hs.add(s2);
12.        System.out.println(hs.size()); } }
```

What is the result?

A. 0
B. 1
C. 2
D. 3
E. 4
F. Compilation fails.
G. An exception is thrown at runtime.

Answer: D

QUESTION 10
Given:

```
11. //insert code here
    private N min, max;
    public N getMin() { return min; }
    public N getMax() { return max; }
    public void add(N added) {
        if (min == null || added.doubleValue() < min.doubleValue())
            min = added;
        if (max == null || added.doubleValue() > max.doubleValue())
            max = added;
    }
}
```

Which two, inserted at line 11, will allow the code to compile? (Choose two.)

A. public class MinMax<?> {
B. public class MinMax<? extends Number> {
C. public class MinMax<N extends Object> {
D. public class MinMax<N extends Number> {
E. public class MinMax<? extends Object> {
F. public class MinMax<N extends Integer> {

Answer: DF

QUESTION 11

Given:

```
3. import java.util.*;
4. public class G1 {
5.    public void takeList(List<? extends String> list) {
6. //        insert code here
7.     }
8. }
```

Which three code fragments, inserted independently at line 6, will compile? (Choose three.)

A. list.add("foo");
B. Object o = list;
C. String s = list.get(0);
D. list = new ArrayList<String>();
E. list = new ArrayList<Object>();

Answer: BCD

QUESTION 12

Given that the elements of a PriorityQueue are ordered according to natural ordering, and:

```
import java.util.*;
public class GetInLine {
    public static void main(String[] args) {
        PriorityQueue<String> pq = new PriorityQueue<String>();
        pq.add("banana");
        pq.add("pear");
        pq.add("apple");
        System.out.println(pq.poll() + " " + pq.peek());
    }
}
```

What is the result?

A. apple pear
B. banana pear
C. apple apple
D. apple banana

E. banana banana

Answer: D

QUESTION 13
Given:
```
enum Example { ONE, TWO, THREE }
```
Which statement is true?

A. The expressions (ONE == ONE) and ONE.equals(ONE) are both guaranteed to be true.
B. The expression (ONE < TWO) is guaranteed to be true and ONE.compareTo(TWO) is guaranteed to be less than one.
C. The Example values cannot be used in a raw java.util.HashMap; instead, the programmer must use a java.util.EnumMap.
D. The Example values can be used in a java.util.SortedSet, but the set will NOT be sorted because enumerated types do NOT implement java.lang.Comparable.

Answer: A

QUESTION 14
Given:
```
import java.util.*;
public class Mapit {
    public static void main(String[] args) {
        Set<Integer> set = new HashSet<Integer>();
        Integer i1 = 45;
        Integer i2 = 46;
        set.add(i1);
        set.add(i1);
        set.add(i2); System.out.print(set.size() + " ");
        set.remove(i1); System.out.print(set.size() + " ");
        i2 = 47;
        set.remove(i2); System.out.print(set.size() + " ");
    }
}
```
What is the result?

A. 2 1 0
B. 2 1 1
C. 3 2 1
D. 3 2 2
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: B

QUESTION 15
Given:
```
import java.util.*;
public class Explorer1 {
    public static void main(String[] args) {
        TreeSet<Integer> s = new TreeSet<Integer>();
        TreeSet<Integer> subs = new TreeSet<Integer>();
        for(int i = 606; i < 613; i++)
            if(i%2 == 0) s.add(i);
        subs = (TreeSet)s.subSet(608, true, 611, true);
        s.add(609);
        System.out.println(s + " " + subs);
```

```
    }
}
```
What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. [608, 609, 610, 612] [608, 610]
D. [608, 609, 610, 612] [608, 609, 610]
E. [606, 608, 609, 610, 612] [608, 610]
F. [606, 608, 609, 610, 612] [608, 609, 610]

Answer: F

QUESTION 16
Given:
```
import java.util.*;
public class Quest {
    public static void main(String[] args) {
        String[] colors = {"blue", "red", "green", "yellow", "orange"};
        Arrays.sort(colors);
        int s2 = Arrays.binarySearch(colors, "orange");
        int s3 = Arrays.binarySearch(colors, "violet");
        System.out.println(s2 + " " + s3);
    }
}
```
What is the result?

A. 2 -1
B. 2 -4
C. 2 -5
D. 3 -1
E. 3 -4
F. 3 -5
G. Compilation fails.
H. An exception is thrown at runtime.

Answer: C

QUESTION 17
Given:
```
HashMap props = new HashMap();
props.put("key45", "some value");
props.put("key12", "some other value");
props.put("key39", "yet another value");
Set s = props.keySet();
//insert code here
```
What, inserted at line 39, will sort the keys in the props HashMap?

A. Arrays.sort(s);
B. s = new TreeSet(s);
C. Collections.sort(s);
D. s = new SortedSet(s);

Answer: B

QUESTION 18

Which two statements are true? (Choose two.)

A. It is possible to synchronize static methods.
B. When a thread has yielded as a result of yield(), it releases its locks.
C. When a thread is sleeping as a result of sleep(), it releases its locks.
D. The Object.wait() method can be invoked only from a synchronized context.
E. The Thread.sleep() method can be invoked only from a synchronized context.
F. When the thread scheduler receives a notify() request, and notifies a thread, that thread immediately releases its lock.

Answer: AD

QUESTION 19
Given:

```
public class TestOne implements Runnable {
    public static void main (String[] args) throws Exception {
        Thread t = new Thread(new TestOne());
        t.start();
        System.out.print("Started");
        t.join();
        System.out.print("Complete");
    }
    public void run() {
        for (int i = 0; i < 4; i++) {
            System.out.print(i);
        }
    }
}
```

What can be a result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. The code executes and prints "StartedComplete".
D. The code executes and prints "StartedComplete0123".
E. The code executes and prints "Started0123Complete".

Answer: E

QUESTION 20
Which three will compile and run without exception? (Choose three.)

A. `private synchronized Object o;`
B.
```
void go() {
synchronized() { /* code here */ }
```
C. `public synchronized void go() { /* code here */ }`
D. `private synchronized(this) void go() { /* code here */ }`
E.
```
void go() {
synchronized(Object.class) { /* code here */ }
```
F.
```
void go() {
Object o = new Object();
synchronized(o) { /* code here */ }
```

Answer: CEF

QUESTION 21
Given:

```
1. public class TestFive {
2.     private int x;
3.     public void foo() {
4.         int current = x;
5.         x = current + 1;
6.     }
7.     public void go() {
8.         for(int i = 0; i < 5; i++) {
9.             new Thread() {
10.                public void run() {
11.                    foo();
12.                    System.out.print(x + ", ");
13.                } }.start();
14.        } }
15.}
```

Which two changes, taken together, would guarantee the output: 1, 2, 3, 4, 5, ? (Choose two.)

A. move the line 12 print statement into the foo() method
B. change line 7 to public synchronized void go() {
C. change the variable declaration on line 2 to private volatile int x;
D. wrap the code inside the foo() method with a synchronized(this) block
E. wrap the for loop code inside the go() method with a synchronized block synchronized(this) { // for loop code here }

Answer: AD

QUESTION 22
Given that t1 is a reference to a live thread, which is true?

A. The Thread.sleep() method can take t1 as an argument.
B. The Object.notify() method can take t1 as an argument.
C. The Thread.yield() method can take t1 as an argument.
D. The Thread.setPriority() method can take t1 as an argument.
E. The Object.notify() method arbitrarily chooses which thread to notify.

Answer: E

QUESTION 23
Given:

```
Runnable r = new Runnable() {
    public void run() {
        System.out.print("Cat");
    }
};
Thread t = new Thread(r) {
    public void run() {
        System.out.print("Dog");
    }
};
t.start();
```

What is the result?

A. Cat
B. Dog
C. Compilation fails.
D. The code runs with no output.
E. An exception is thrown at runtime.

Answer: B

QUESTION 24
Given:
```
1. public class Threads5 {
2.     public static void main (String[] args) {
3.         new Thread(new Runnable() {
4.             public void run() {
5.                 System.out.print("bar");
6.             }}).start();
7.     }
8. }
```
What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. The code executes normally and prints "bar".
D. The code executes normally, but nothing prints.

Answer: C

QUESTION 25
Given:
```
class One {
    void foo() { }
}
class Two extends One {
14. //    insert method here
}
```
Which three methods, inserted individually at line 14, will correctly complete class Two? (Choose three.)

A. int foo() { /* more code here */ }
B. void foo() { /* more code here */ }
C. public void foo() { /* more code here */ }
D. private void foo() { /* more code here */ }
E. protected void foo() { /* more code here */ }

Answer: BCE

QUESTION 26
Given:
```
abstract public class Employee {
    protected abstract double getSalesAmount();
    public double getCommision() {
        return getSalesAmount() * 0.15;
    }
}
class Sales extends Employee {
17. //    insert method here
}
```
Which two methods, inserted independently at line 17, correctly complete the Sales class? (Choose two.)

A. double getSalesAmount() { return 1230.45; }
B. public double getSalesAmount() { return 1230.45; }
C. private double getSalesAmount() { return 1230.45; }
D. protected double getSalesAmount() { return 1230.45; }

Answer: BD

QUESTION 27
Given:
```
1. class X {
2.     X() { System.out.print(1); }
3.     X(int x) {
4.         this(); System.out.print(2);
5.     }
6. }
7. public class Y extends X {
8.     Y() { super(6); System.out.print(3); }
9.     Y(int y) {
10.        this(); System.out.println(4);
11.    }
12.    public static void main(String[] a) { new Y(5); }
13.}
```
What is the result?

A. 13
B. 134
C. 1234
D. 2134
E. 2143
F. 4321

Answer: C

QUESTION 28
Given:
```
package com.sun.scjp;
public class Geodetics {
    public static final double DIAMETER = 12756.32; // kilometers
}
```
Which two correctly access the DIAMETER member of the Geodetics class? (Choose two.)

A.
```
import com.sun.scjp.Geodetics;
public class TerraCarta {
    public double halfway()
    { return Geodetics.DIAMETER/2.0; }
```
B.
```
import static com.sun.scjp.Geodetics;
public class TerraCarta{
public double halfway() { return DIAMETER/2.0; } }
```
C.
```
import static com.sun.scjp.Geodetics.*;
public class TerraCarta {
    public double halfway() { return DIAMETER/2.0; } }
```
D.
```
package com.sun.scjp;
public class TerraCarta {
    public double halfway() { return DIAMETER/2.0; } }
```

Answer: AC

QUESTION 29
Given:
```
1. public class A {
2.     public void doit() {
```

```
3.      }
4.      public String doit() {
5.          return "a";
6.      }
7.      public double doit(int x) {
8.          return 1.0;
9.      }
10.}
```
What is the result?

A. An exception is thrown at runtime.
B. Compilation fails because of an error in line 7.
C. Compilation fails because of an error in line 4.
D. Compilation succeeds and no runtime errors with class A occur.

Answer: C

QUESTION 30
Given:
```
35. String #name = "Jane Doe";
36. int $age = 24;
37. Double _height = 123.5;
38. double ~temp = 37.5;
```
Which two statements are true? (Choose two.)

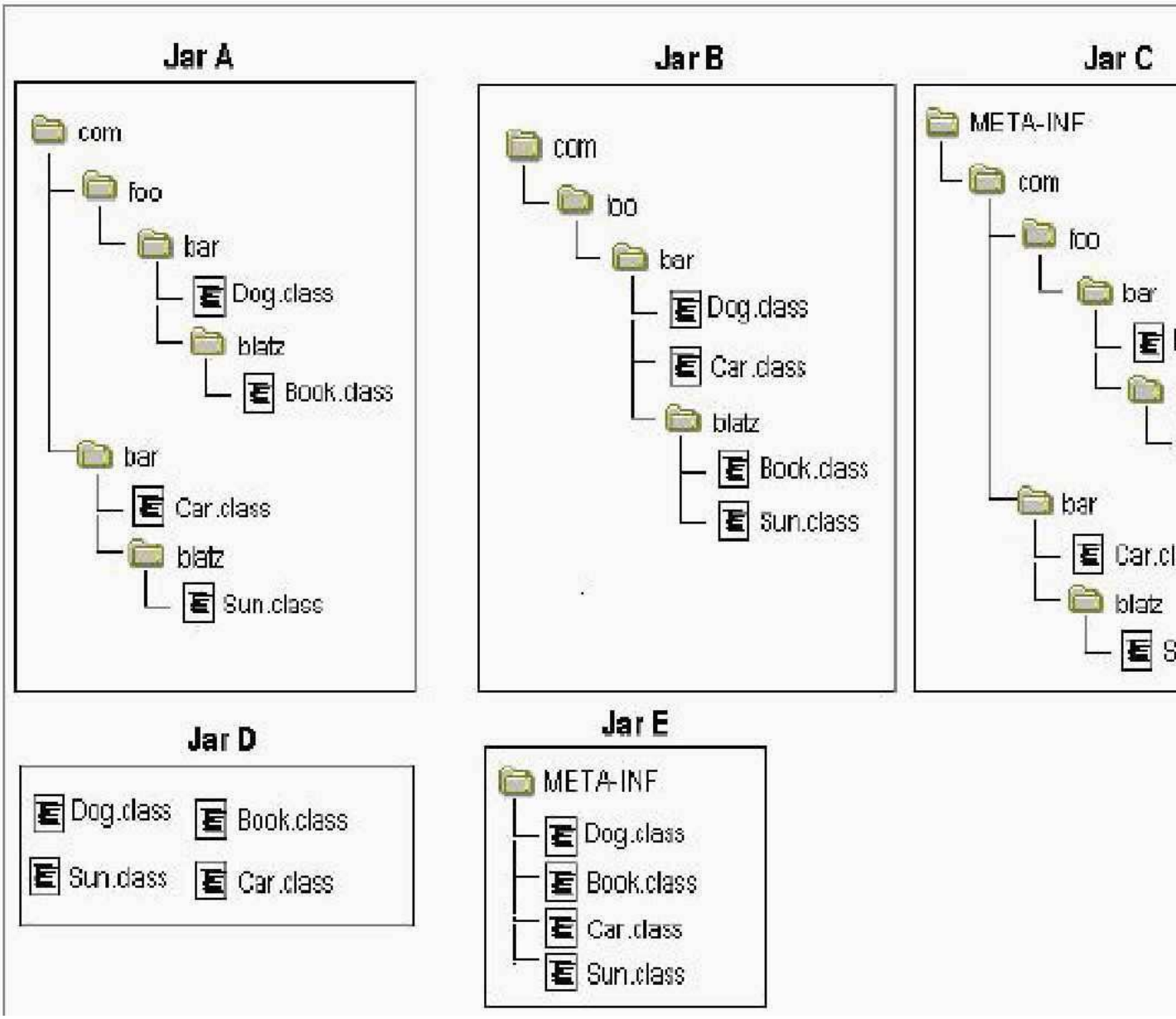
A. Line 35 will not compile.
B. Line 36 will not compile.
C. Line 37 will not compile.
D. Line 38 will not compile.

Answer: AD

QUESTION 31
Click the Exhibit button.
Given the fully-qualified class names:

- com.foo.bar.Dog
- com.foo.bar.blatz.Book
- com.bar.Car
- com.bar.blatz.Sun

Which graph represents the correct directory structure for a JAR file from which those classes can be used by the compiler and JVM?



A. Jar A
B. Jar B
C. Jar C
D. Jar D
E. Jar E

Answer: A

QUESTION 32
Click the Exhibit button.
Given: ClassA a = new ClassA();
a.methodA();

```
10. public class ClassA {
11.   public void methodA() {
12.     ClassB classB = new ClassB();
13.     classB.getValue();
14.   }
15. }
```

And:

```
20. class ClassB {
21.   public ClassC classC;
22.
23.   public String getValue() {
24.     return classC.getValue();
25.   }
26. }
```

And:

```
30. class ClassC {
31.   public String value;
32.
33.   public String getValue() {
34.     value = "ClassB";
35.     return value;
36.   }
37. }
```

What is the result?

A. Compilation fails.
B. ClassC is displayed.
C. The code runs with no output.
D. An exception is thrown at runtime.

Answer: D

Exam D

QUESTION 1
Given:

```
interface Foo { int bar(); }
public class Sprite {
    public int fubar( Foo foo ) { return foo.bar(); }
    public void testFoo() {
        fubar(
          //insert code here 15
        );
    }
}
```

Which code, inserted at line 15, allows the class Sprite to compile?

A. Foo { public int bar() { return 1; }
B. new Foo { public int bar() { return 1; }
C. new Foo() { public int bar() { return 1; }
D. new class Foo { public int bar() { return 1; }

Answer: C

QUESTION 2
Given:

```
11. public enum Title {
12.    MR("Mr."), MRS("Mrs."), MS("Ms.");
13.     private final String title;
14.     private Title(String t) { title = t; }
15.     public String format(String last, String first) {
16.         return title + " " + first + " " + last;
17.     }
18. }

    public static void main(String[] args) {
        System.out.println(Title.MR.format("Doe", "John"));
    }
```

What is the result?

A. Mr. John Doe
B. An exception is thrown at runtime.
C. Compilation fails because of an error in line 12.
D. Compilation fails because of an error in line 15.
E. Compilation fails because of an error in line 20.

Answer: A

QUESTION 3
Given the following six method names:

- addListener
- addMouseListener
- setMouseListener
- deleteMouseListener
- removeMouseListener
- registerMouseListener

How many of these method names follow JavaBean Listener naming rules?

A. 1
B. 2
C. 3
D. 4
E. 5

Answer: B

QUESTION 4
Given:

```
class Line {
    public static class Point {}
}

class Triangle {
    public Triangle(){
       //  insert code here
    }
}
```

Which code, inserted at line 15, creates an instance of the Point class defined in Line?

A. Point p = new Point();
B. Line.Point p = new Line.Point();
C. The Point class cannot be instatiated at line 15.
D. Line l = new Line() ; l.Point p = new l.Point();

Answer: B

QUESTION 5
Given

```
11. public interface Status {
12.    /* insert code here */ int MY_VALUE = 10;
13. }
```

Which three are valid on line 12? (Choose three.)

A. final
B. static
C. native
D. public
E. private
F. abstract
G. protected

Answer: ABD

QUESTION 6
Click the Exhibit button.
Given this code from Class B:

```
25. A a1 = new A();
26. A a2 = new A();
27. A a3 = new A();
28. System.out.println(A.getInstanceCount());
```

What is the result?

```
1. public class A{
2.
3.     private int counter = 0;
4.
5.     public static int getInstanceCount() {
6.         return counter;
7.     }
8.
9.     public A() {
10.        counter++;
11.    }
12.
13.}
```

A. Compilation of class A fails.
B. Line 28 prints the value 3 to System.out.
C. Line 28 prints the value 1 to System.out.
D. A runtime error occurs when line 25 executes.
E. Compilation fails because of an error on line 28.

Answer: A

QUESTION 7
Given classes defined in two different files:

```
1. package util;
2. public class BitUtils {
3.     public static void process(byte[] b) { /* more code here */ }
4. }
```

```
1. package app;
2. public class SomeApp {
3.     public static void main(String[] args) {
4.         byte[] bytes = new byte[256];
5. //         insert code here
6.     }
7. }
```

What is required at line 5 in class SomeApp to use the process method of BitUtils?

A. process(bytes);
B. BitUtils.process(bytes);
C. util.BitUtils.process(bytes);
D. SomeApp cannot use methods in BitUtils.
E. import util.BitUtils.*; process(bytes);

Answer: C

QUESTION 8
Click the Exhibit button.
Which three code fragments, added individually at line 29, produce the output 100? (Choose three.)

```
class Inner {
    private int x;
    public void setX( int x ){ this.x = x; }
    public int getX(){ return x;}
}
```

```
class Outer {
    private Inner y;
    public void setY( Inner y ){ this.y = y; }
    public Inner getY() { return y; }
}

public class Gamma {
    public static void main(String[] args) {
        Outer o = new Outer();
        Inner i = new Inner();
        int n = 10;
        i.setX(n);
        o.setY(i);
        // insert code here 29
        System.out.println(o.getY().getX());

    }
}
```

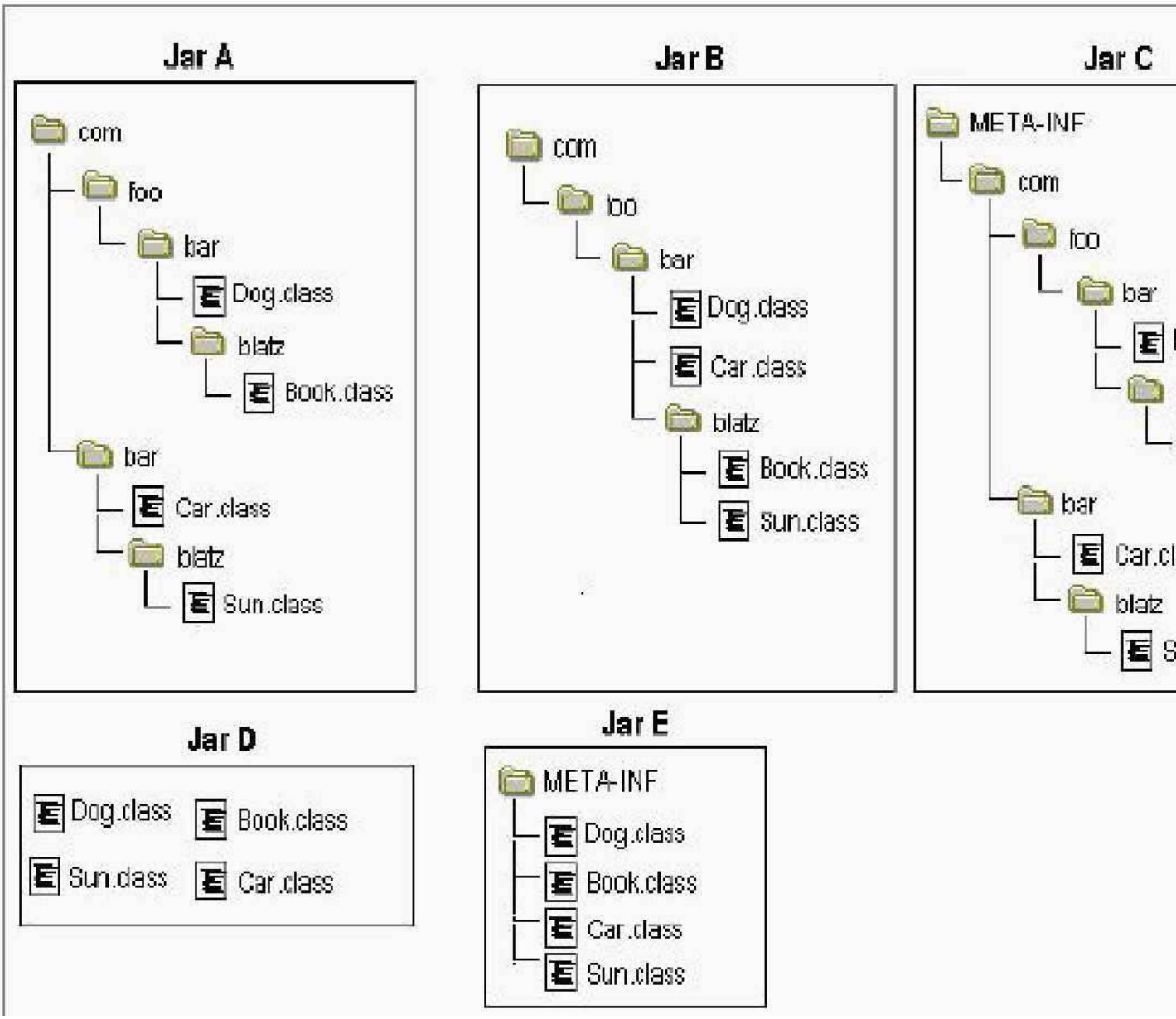
A. n = 100;
B. i.setX(100);
C. o.getY().setX(100);
D. i = new Inner(); i.setX(100);
E. o.setY(i); i = new Inner(); i.setX(100);
F. i = new Inner(); i.setX(100); o.setY(i);

Answer: BCF

QUESTION 9
Click the Exhibit button.
Given the fully-qualified class names:

- com.foo.bar.Dog
- com.foo.bar.blatz.Book
- com.bar.Car
- com.bar.blatz.Sun

Which graph represents the correct directory structure for a JAR file from which those classes can be used by the compiler and JVM?



A. Jar A
B. Jar B
C. Jar C
D. Jar D
E. Jar E

Answer: A

QUESTION 10
Which statement is true?

A. A class's finalize() method CANNOT be invoked explicitly.
B. super.finalize() is called implicitly by any overriding finalize() method.
C. The finalize() method for a given object is called no more than once by the garbage collector.
D. The order in which finalize() is called on two objects is based on the order in which the two objects became finalizable.

Answer: C

QUESTION 11
Given:

```
class Snoochy {
    Boochy booch;

    public Snoochy() { booch = new Boochy(this); }
}

class Boochy {
    Snoochy snooch;
    public Boochy(Snoochy s) { snooch = s; }
}
```

And the statements:

```
public static void main(String[] args) {
    Snoochy snoog = new Snoochy();
    snoog = null; //Línea 23
   //    more code here
}
```

Which statement is true about the objects referenced by snoog, snooch, and booch immediately after line 23 executes?

A. None of these objects are eligible for garbage collection.
B. Only the object referenced by booch is eligible for garbage collection.
C. Only the object referenced by snoog is eligible for garbage collection.
D. Only the object referenced by snooch is eligible for garbage collection.
E. The objects referenced by snooch and booch are eligible for garbage collection.

Answer: E

QUESTION 12
Given:

```
3. interface Animal { void makeNoise(); }
4. class Horse implements Animal {
5.    Long weight = 1200L;
6. public void makeNoise() { System.out.println("whinny"); }
7. }
8. public class Icelandic extends Horse {
    9. public void makeNoise() { System.out.println("vinny"); }
    10. public static void main(String[] args) {
        11. Icelandic i1 = new Icelandic();
        12. Icelandic i2 = new Icelandic();
        13. Icelandic i3 = new Icelandic();
        14. i3 = i1; i1 = i2; i2 = null; i3 = i1;
        15. }
    16. }
```

When line 15 is reached, how many objects are eligible for the garbage collector?

A. 0
B. 1
C. 2
D. 3

E. 4
F. 6

Answer: E

QUESTION 13
Given:

```
class Payload {
    private int weight;
    public Payload (int w) { weight = w; }
    public void setWeight(int w) { weight = w; }
    public String toString() { return Integer.toString(weight); }
}
public class TestPayload {
    static void changePayload(Payload p) { /* insert code */ }  //Línea 12
    public static void main(String[] args) {
        Payload p = new Payload(200);
        p.setWeight(1024);
        changePayload(p);
        System.out.println("p is " + p);
    } }
```

Which code fragment, inserted at the end of line 12, produces the output p is 420?

A. p.setWeight(420);
B. p.changePayload(420);
C. p = new Payload(420);
D. Payload.setWeight(420);
E. p = Payload.setWeight(420);

Answer: A

QUESTION 14
Given:

```
public static void test(String str) {
    int check = 4;
    if (check = str.length()) {
        System.out.print(str.charAt(check -= 1) +", ");
    } else {
        System.out.print(str.charAt(0) + ", ");
    }
}
```

and the invocation:

```
test("four");
test("tee");
test("to");
```

What is the result?

A. r, t, t,
B. r, e, o,
C. Compilation fails.
D. An exception is thrown at runtime.

Answer: C

QUESTION 15
A UNIX user named Bob wants to replace his chess program with a new one, but he is not sure where the old one is installed.
Bob is currently able to run a Java chess program starting from his home directory /home/bob using the command:
java -classpath /test:/home/bob/downloads/.jar* games.
Chess Bob's CLASSPATH is set (at login time) to:
/usr/lib:/home/bob/classes:/opt/java/lib:/opt/java/lib/.jar*

What is a possible location for the Chess.class file?

A. /test/Chess.class
B. /home/bob/Chess.class
C. /test/games/Chess.class
D. /usr/lib/games/Chess.class
E. /home/bob/games/Chess.class
F. inside jarfile /opt/java/lib/Games.jar (with a correct manifest)
G. inside jarfile /home/bob/downloads/Games.jar (with a correct manifest)

Answer: C

QUESTION 16
Given classes defined in two different files:

```
package util;
public class BitUtils {
    private static void process(byte[] b) {}
}
package app;
public class SomeApp {
    public static void main(String[] args) {
        byte[] bytes = new byte[256];
//          insert code here Linea 5
    }
}
```

What is required at line 5 in class SomeApp to use the process method of BitUtils?

A. process(bytes);
B. BitUtils.process(bytes);
C. app.BitUtils.process(bytes);
D. util.BitUtils.process(bytes);
E. import util.BitUtils.*; process(bytes);
F. SomeApp cannot use the process method in BitUtils.

Answer: F

QUESTION 17
Given:

```
public class Pass2 {
    public void main(String [] args) {
```

```
        int x = 6;
        Pass2 p = new Pass2();
        p.doStuff(x);
        System.out.print(" main x = " + x);
    }

    void doStuff(int x) {
        System.out.print(" doStuff x = " + x++);
    }
}
```

And the command-line invocations:

```
javac Pass2.java
java Pass2 5
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. doStuff x = 6 main x = 6
D. doStuff x = 6 main x = 7
E. doStuff x = 7 main x = 6
F. doStuff x = 7 main x = 7

Answer: B

QUESTION 18
Given:

```
public class Test {
    public enum Dogs {collie, harrier};
    public static void main(String [] args) {
        Dogs myDog = Dogs.collie;
        switch (myDog) {
        case collie:
            System.out.print("collie ");
        case harrier:
            System.out.print("harrier ");
        }
    }
}
```

What is the result?

A. collie
B. harrier
C. Compilation fails.
D. collie harrier
E. An exception is thrown at runtime.

Answer: D

QUESTION 19
Given:

```
public class Donkey {
    public static void main(String[] args) {
        boolean assertsOn = false;
```

```
        assert (assertsOn) : assertsOn = true;
        if(assertsOn) {
            System.out.println("assert is on");
        }
    }
}
```

If class Donkey is invoked twice, the first time without assertions enabled, and the second time with assertions enabled, what are the results?

A. no output
B. no output
   assert is on
C. assert is on
D. no output
   An AssertionError is thrown.
E. assert is on
   An AssertionError is thrown.

Answer: D

QUESTION 20
Given:

```
static void test() {
    try {
        String x = null;
        System.out.print(x.toString() + " ");
    }
    finally { System.out.print("finally "); }
}
public static void main(String[] args) {
    try { test(); }
    catch (Exception ex) { System.out.print("exception "); }
}
```

What is the result?

A. null
B. finally
C. null finally
D. Compilation fails.
E. finally exception

Answer: E

QUESTION 21
Given:

```
static void test() throws Error {
    if (true) throw new AssertionError();
    System.out.print("test ");
}
public static void main(String[] args) {
    try { test(); }
    catch (Exception ex) { System.out.print("exception "); }
    System.out.print("end ");
}}
```

What is the result?

A. end
B. Compilation fails.

C. exception end
D. exception test end
E. A Throwable is thrown by main.
F. An Exception is thrown by main.

Answer: E

QUESTION 22
Given:

```
class TestException extends Exception { }
class A {
    public String sayHello(String name) throws TestException {
        if(name == null) throw new TestException();
        return "Hello " + name;
    }
}
public class TestA {
    public static void main(String[] args) {
        new A().sayHello("Aiko");
    }
}
```

Which statement is true?

A. Compilation succeeds.
B. Class A does not compile.
C. The method declared on line 9 cannot be modified to throw TestException.
D. TestA compiles if line 10 is enclosed in a try/catch block that catches TestException.

Answer: D

QUESTION 23
Given:

```
public static Collection get() {
    Collection sorted = new LinkedList();
    sorted.add("B"); sorted.add("C"); sorted.add("A");
    return sorted;
}
public static void main(String[] args) {
    for (Object obj: get()) {
        System.out.print(obj + ", ");
    }
}
```

What is the result?

A. A, B, C,
B. B, C, A,
C. Compilation fails.
D. The code runs with no output.
E. An exception is thrown at runtime.

Answer: B

QUESTION 24

Given:

```
static class A {
    void process() throws Exception { throw new Exception(); }
}
static class B extends A {
    void process() { System.out.println("B"); }
}
public static void main(String[] args) {
    new B().process();
}
```

What is the result?

A. B
B. The code runs with no output.
C. Compilation fails because of an error in line 12.
D. Compilation fails because of an error in line 15.
E. Compilation fails because of an error in line 18.

Answer: A

QUESTION 25

Given:

```
public class Foo {
    static int[] a;
    static { a[0]=2; }
    public static void main( String[] args ) {}
}
```

Which exception or error will be thrown when a programmer attempts to run this code?

A. java.lang.StackOverflowError
B. java.lang.IllegalStateException
C. java.lang.ExceptionInInitializerError
D. java.lang.ArrayIndexOutOfBoundsException

Answer: C

QUESTION 26

Click the Exhibit button.
Given: ClassA a = new ClassA();
a.methodA();

```
10. public class ClassA {
11.   public void methodA() {
12.     ClassB classB = new ClassB();
13.     classB.getValue();
14.   }
15. }
```

And:

```
20. class ClassB {
21.   public ClassC classC;
22.
23.   public String getValue() {
24.     return classC.getValue();
25.   }
26. }
```

And:

```
30. class ClassC {
31.   public String value;
32.
33.   public String getValue() {
34.     value = "ClassB";
35.     return value;
36.   }
37. }
```

What is the result?

A. Compilation fails.
B. ClassC is displayed.
C. The code runs with no output.
D. An exception is thrown at runtime.

Answer: D

QUESTION 27
Given:

```
public static void main(String[] args) {
    Integer i = new Integer(1) + new Integer(2);
    switch(i) {
    case 3: System.out.println("three"); break;
    default: System.out.println("other"); break;
    }
}
```

What is the result?

A. three
B. other
C. An exception is thrown at runtime.
D. Compilation fails because of an error on line 12.
E. Compilation fails because of an error on line 13.
F. Compilation fails because of an error on line 15.

Answer: A

QUESTION 28
Given:

```
public static Iterator reverse(List list) {
    Collections.reverse(list);
    return list.iterator();
}
public static void main(String[] args) {
    List list = new ArrayList();
    list.add("1"); list.add("2"); list.add("3");
    for (Object obj: reverse(list))
        System.out.print(obj + ", ");
}
```

What is the result?

A. 3, 2, 1,
B. 1, 2, 3,
C. Compilation fails.
D. The code runs with no output.
E. An exception is thrown at runtime.

Answer: C

QUESTION 29
Given:

```
1. public class TestString3 {
2.     public static void main(String[] args) {
3. //        insert code here
4.
5.         System.out.println(s);
6.     }
7. }
```

Which two code fragments, inserted independently at line 3, generate the output 4247? (Choose two.)

A. String s = "123456789";
   s = (s-"123").replace(1,3,"24") - "89";
B. StringBuffer s = new StringBuffer("123456789");
C. s.delete(0,3).replace(1,3,"24").delete(4,6);
D. StringBuffer s = new StringBuffer("123456789");
E. substring(3,6).delete(1,3).insert(1, "24");
F. StringBuilder s = new StringBuilder("123456789");
G. substring(3,6).delete(1,2).insert(1, "24");
H. StringBuilder s = new StringBuilder("123456789");
I. delete(0,3).delete(1,3).delete(2,5).insert(1, "24");

Answer: BC

QUESTION 30
Given:

1. d is a valid, non-null Date object
2. df is a valid, non-null DateFormat object set to the current locale

What outputs the current locale's country name and the appropriate version of d's date?

A.
```
Locale loc = Locale.getLocale();
System.out.println(loc.getDisplayCountry()
        + " " + df.format(d));
```
B.
```
Locale loc = Locale.getDefault();
System.out.println(loc.getDisplayCountry()
        + " " + df.format(d));
```
C.
```
Locale loc = Locale.getLocale();
System.out.println(loc.getDisplayCountry()
        + " " + df.setDateFormat(d));
```
D.
```
Locale loc = Locale.getDefault();
System.out.println(loc.getDisplayCountry()
        + " " + df.setDateFormat(d));
```

Answer: B

QUESTION 31
Click the Exhibit button.
What is the output if the main() method is run?

```
1. public class Starter extends Thread {
2.     private int x = 2;
3.     public static void main(String[] args) throws Exception {
4.         new Starter().makeItSo();
5.     }
6.     public Starter(){
7.         x = 5;
8.         start();
9.     }
10.    public void makeItSo() throws Exception {
11.        join();
12.        x = x - 1;
13.        System.out.println(x);
14.    }
15.    public void run() { x *= 2; }
```

16. }

A. 4
B. 5
C. 8
D. 9
E. Compilation fails.
F. An exception is thrown at runtime.
G. It is impossible to determine for certain.

Answer: D

QUESTION 32
Given:

```
21. class Money {
22.    private String country = "Canada";
23.    public String getC() { return country; }
24. }
25. class Yen extends Money {
26.    public String getC() { return super.country; }
27. }
28. public class Euro extends Money {
29.    public String getC(int x) { return super.getC(); }
30.    public static void main(String[] args) {
31.        System.out.print(new Yen().getC() + " " + new Euro().getC());
32.    }
33. }
```

What is the result?

A. Canada
B. null Canada
C. Canada null
D. Canada Canada
E. Compilation fails due to an error on line 26.
F. Compilation fails due to an error on line 29.

Answer: E

Exam E

QUESTION 1
Given:

```
import java.util.Date;
import java.text.DateFormat;

DateFormat df;
Date date = new Date();
//insert code here Linea 23
String s = df.format(date);
```

Which code fragment, inserted at line 23, allows the code to compile?

A. df = new DateFormat();
B. df = Date.getFormat();
C. df = date.getFormat();
D. df = DateFormat.getFormat();
E. df = DateFormat.getInstance();

Answer: E

QUESTION 2
Given:

```
1. public class BuildStuff {
2.     public static void main(String[] args) {
3.         Boolean test = new Boolean(true);
4.         Integer x = 343;
5.         Integer y = new BuildStuff().go(test, x);
6.         System.out.println(y);
7.     }
8.     int go(Boolean b, int i) {
9.         if(b) return (i/7);
10.        return (i/49);
11.    }
12.}
```

What is the result?

A. 7
B. 49
C. 343
D. Compilation fails.
E. An exception is thrown at runtime.

Answer: B

QUESTION 3
Given:

```
import java.io.*;
public class Forest implements Serializable {
    private Tree tree = new Tree();
    public static void main(String [] args) {
        Forest f = new Forest();
```

```
        try {

            FileOutputStream fs = new FileOutputStream("Forest.ser");
            ObjectOutputStream os = new ObjectOutputStream(fs);
            os.writeObject(f); os.close();
        } catch (Exception ex) { ex.printStackTrace(); }
    }
}

class Tree { }
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. An instance of Forest is serialized.
D. An instance of Forest and an instance of Tree are both serialized.

Answer: B

QUESTION 4
Which capability exists only in java.io.FileWriter?

A. Closing an open stream.
B. Flushing an open stream.
C. Writing to an open stream.
D. Writing a line separator to an open stream.

Answer: D

QUESTION 5
Given:

```
1. import java.io.*;
2.
3.
4.
5.
6. public class Talk {
7.     public static void main(String[] args) {
8.         Console c = new Console();
9.         String pw;
10.        System.out.print("password: ");
11.        pw = c.readLine();
12.        System.out.println("got " + pw);
13.    }
14.}
```

If the user types the password aiko when prompted, what is the result?

A. password:
   got
B. password:
   got aiko
C. password: aiko
   got aiko
D. An exception is thrown at runtime.

E. Compilation fails due to an error on line 8.

Answer: E

QUESTION 6
Given:

```
1. public class LineUp {
2.     public static void main(String[] args) {
3.         double d = 12.345;
4.         // insert code here
5.     }
6. }
```

Which code fragment, inserted at line 4, produces the output | 12.345|?

A. `System.out.printf("|%7d| \n", d);`
B. `System.out.printf("|%7f| \n", d);`
C. `System.out.printf("|%3.7d| \n", d);`
D. `System.out.printf("|%3.7f| \n", d);`
E. `System.out.printf("|%7.3d| \n", d);`
F. `System.out.printf("|%7.3f| \n", d);`

Answer: F

QUESTION 7
Given:

```
11. String test = "Test A. Test B. Test C.";
12. // insert code here
13. String[] result = test.split(regex);
```

Which regular expression, inserted at line 12, correctly splits test into "Test A", "Test B", and "Test C"?

A. `String regex = "";`
B. `String regex = " ";`
C. `String regex = ".*";`
D. `String regex = "\\s";`
E. `String regex = "\\.\\s*";`
F. `String regex = "\\w[ \.] +";`

Answer: E

QUESTION 8
Given:

```
1. interface A { public void aMethod(); }
2. interface B { public void bMethod(); }
3. interface C extends A,B { public void cMethod(); }
4. class D implements B {
5. public void bMethod(){}
6. }
7. class E extends D implements C {
8. public void aMethod(){}
9. public void bMethod(){}
10.public void cMethod(){}
11.}
```

What is the result?

A. Compilation fails because of an error in line 3.
B. Compilation fails because of an error in line 7.
C. Compilation fails because of an error in line 9.
D. If you define D e = new E(), then e.bMethod() invokes the version of bMethod() defined in Line 5.
E. If you define D e = (D)(new E()), then e.bMethod() invokes the version of bMethod() defined in Line 5.
F. If you define D e = (D)(new E()), then e.bMethod() invokes the version of bMethod() defined in Line 9.

Answer: F

QUESTION 9
Click the Exhibit button.
What is the result?

```
1. public class SimpleCalc {
2.    public int value;
3.    public void calculate() { value += 7; }
4. }
```

And:

```
1. public class MultiCalc extends
SimpleCalc{
2.    public void calculate() { value -= 3; }
3.    public void calculate(int multiplier) {
4.       calculate();
5.       super.calculate();
6.       value *= multiplier;
7.    }
8.    public static void main(String[] args)
{
9.       MultiCalc calculator = new
MultiCalc();
10.      calculator.calculate(2);
11.      System.out.println("Value is: " +
calculator.value);
12.   }
13. }
```

A. Value is: 8

B. Compilation fails.
C. Value is: 12
D. Value is: -12
E. The code runs with no output.
F. An exception is thrown at runtime.

Answer: A

QUESTION 10
Given:

```
public class Base {
    public static final String FOO = "foo";

    public static void main(String[] args) {
        Base b = new Base();
        Sub s = new Sub();
        System.out.print(Base.FOO);
        System.out.print(Sub.FOO);
        System.out.print(b.FOO);
        System.out.print(s.FOO);
        System.out.print(((Base) s).FOO);
    }
}

class Sub extends Base {
    public static final String FOO = "bar";
}
```

What is the result?

A. foofoofoofoofoo
B. foobarfoobarbar
C. foobarfoofoofoo
D. foobarfoobarfoo
E. barbarbarbarbar
F. foofoofoobarbar
G. foofoofoobarfoo

Answer: D

QUESTION 11
Given:

```
1. class Mammal {
2. }
3.
4. class Raccoon extends Mammal {
5.     Mammal m = new Mammal();
6. }
7.
8. class BabyRaccoon extends Mammal {
9. }
10.
```

Which four statements are true? (Choose four.)

A. Raccoon is-a Mammal.

B. Raccoon has-a Mammal.
C. BabyRaccoon is-a Mammal.
D. BabyRaccoon is-a Raccoon.
E. BabyRaccoon has-a Mammal.
F. BabyRaccoon is-a BabyRaccoon.

Answer: ABCF

QUESTION 12
Given:

```
interface A { void x(); }
class B implements A { public void x() {} public void y() {} }
class C extends B { public void x() {} }
```

And:

```
java.util.List<A> list = new java.util.ArrayList<A>();
list.add(new B());
list.add(new C());
for (A a : list) {
    a.x();
    a.y(); //Linea 25
}
```

What is the result?

A. The code runs with no output.
B. An exception is thrown at runtime.
C. Compilation fails because of an error in line 20.
D. Compilation fails because of an error in line 21.
E. Compilation fails because of an error in line 23.
F. Compilation fails because of an error in line 25.

Answer: F

QUESTION 13
Given:

```
1.
2. public class Hi {
3.     void m1() { }
4.     protected void() m2 { }
5. }
6. class Lois extends Hi {
7. //    insert code here
8. }
```

Which four code fragments, inserted independently at line 7, will compile? (Choose four.)

A. `public void m1() { }`
B. `protected void m1() { }`
C. `private void m1() { }`
D. `void m2() { }`
E. `public void m2() { }`

F. `protected void m2() { }`
G. `private void m2() { }`

Answer: ABEF

QUESTION 14
Which four statements are true? (Choose four.)

A. Has-a relationships should never be encapsulated.
B. Has-a relationships should be implemented using inheritance.
C. Has-a relationships can be implemented using instance variables.
D. Is-a relationships can be implemented using the extends keyword.
E. Is-a relationships can be implemented using the implements keyword.
F. The relationship between Movie and Actress is an example of an is-a relationship.
G. An array or a collection can be used to implement a one-to-many has-a relationship.

Answer: CDEG

QUESTION 15
Given:

```
public class Hello {
    String title;
    int value;

    public Hello() {
        title += " World";
    }

    public Hello(int value) {
        this.value = value;
        title = "Hello";
        Hello();
    }
}
```

and:

```
Hello c = new Hello(5);
System.out.println(c.title);
```

What is the result?

A. Hello
B. Hello World
C. Compilation fails.
D. Hello World 5
E. The code runs with no output.
F. An exception is thrown at runtime.

Answer: C

QUESTION 16
Given:

```
1. package geometry;
2.
```

```
3. public class Hypotenuse {
4.     public InnerTriangle it = new InnerTriangle();
5.
6.     class InnerTriangle {
7.         public int base;
8.         public int height;
9.     }
10.}
```

Which statement is true about the class of an object that can reference the variable base?

A. It can be any class.
B. No class has access to base.
C. The class must belong to the geometry package.
D. The class must be a subclass of the class Hypotenuse.

Answer: C

QUESTION 17
Click the Exhibit button.

```
1. public class A {
2.
3.     private int counter = 0;
4.
5.     public static int getInstanceCount(){
6.         return counter;
7.     }
8.
9.     public A(){
10.        counter++;
11.    }
12.}
13.
```

Given this code from Class B:

```
A a1 = new A();
A a2 = new A();
A a3 = new A();
System.out.println(A.getInstanceCount());
```

What is the result?

A. Compilation of class A fails.
B. Line 28 prints the value 3 to System.out.
C. Line 28 prints the value 1 to System.out.
D. A runtime error occurs when line 25 executes.
E. Compilation fails because of an error on line 28.

Answer: A

QUESTION 18
Given:

```
10. interface Data { public void load(); }
11. abstract class Info { public abstract void load(); }
```

Which class correctly uses the Data interface and Info class?

A.
```
public class Employee extends Info implements Data { public void load() { /
*do something*/ }
}
```
B.
```
public class Employee implements Info extends Data { public void load() { /
*do something*/ }
}
```
C.
```
public class Employee extends Info implements Data public void load(){ /*do
something*/ }
public void Info.load(){ /*do something*/ }
}
```
D.
```
public class Employee implements Info extends Data { public void Data.load()
{ /*do something*/ }
public void load(){ /*do something*/ }
}
```
E.
```
public class Employee implements Info extends Data { public void load(){ /
*do something*/ }
public void Info.load(){ /*do something*/ }
}
```
F.
```
public class Employee extends Info implements Data{ public void Data.load()
{ /*do something*/ }
public void Info.load() { /*do something*/ }
}
```

Answer: A

QUESTION 19
Given:

```
1. class Alligator {
2.     public static void main(String[] args) {
3.         int[] x[] = { { 1, 2 }, { 3, 4, 5 }, { 6, 7, 8, 9 } };
4.         int[][] y = x;
5.         System.out.println(y[2][1]);
6.     }
7. }
```

What is the result?

A. 2
B. 3
C. 4
D. 6
E. 7
F. Compilation fails.

Answer: E

QUESTION 20
Given:

```
abstract class C1 {
public C1() { System.out.print(1); }
}
class C2 extends C1 {
public C2() { System.out.print(2); }
}
class C3 extends C2 {
public C3() { System.out.println(3); }
```

```
}
public class Ctest {
public static void main(String[] a) { new C3(); }
}
```

What is the result?

A. 3
B. 23
C. 32
D. 123
E. 321
F. Compilation fails.
G. An exception is thrown at runtime.

Answer: D

QUESTION 21
Given:

```
class One {
    public One foo() {
        return this;
    }
}

class Two extends One {
    public One foo() {
        return this;
    }
}

class Three extends Two {
    // insert method here
}
```

Which two methods, inserted individually, correctly complete the Three class? (Choose two.)

A. `public void foo() {}`
B. `public int foo() { return 3; }`
C. `public Two foo() { return this; }`
D. `public One foo() { return this; }`
E. `public Object foo() { return this; }`

Answer: CD

QUESTION 22
Which two classes correctly implement both the `java.lang.Runnable` and the `java.lang.Cloneable` interfaces? (Choose two.)

A.
```
public class Session implements Runnable, Cloneable {
      public void run();

      public Object clone();
  }
```

B.
```
public class Session
extends Runnable, Cloneable {
    public void run() { /* do something */ }
    public Object clone() { /* make a copy */ }
```

C.
```
public class Session
implements Runnable, Cloneable {
    public void run() { /* do something */ }
    public Object clone() { /* make a copy */ }
```

D.
```
public abstract class Session
implements Runnable, Cloneable {
    public void run() { /* do something */ }
    public Object clone() { /*make a copy */ }
```

E.
```
public class Session
implements Runnable, implements Cloneable {
    public void run() { /* do something */ }
    public Object clone() { /* make a copy */ }
```

Answer: CD

QUESTION 23
Given:

```
public interface A { public void m1(); }

class B implements A { }
class C implements A { public void m1() { } }
class D implements A { public void m1(int x) { } }
abstract class E implements A { }
abstract class F implements A { public void m1() { } }
abstract class G implements A { public void m1(int x) { } }
```

What is the result?

A. Compilation succeeds.
B. Exactly one class does NOT compile.
C. Exactly two classes do NOT compile.
D. Exactly four classes do NOT compile.
E. Exactly three classes do NOT compile.

Answer: C

QUESTION 24
Given:

```
class Line {
    public class Point {
        public int x, y;
    }

    public Point getPoint() {
        return new Point();
    }
}

class Triangle {
    public Triangle() {
        // insert code here
    }
}
```

Which code, inserted at line 16, correctly retrieves a local instance of a Point object?

A. `Point p = Line.getPoint();`
B. `Line.Point p = Line.getPoint();`
C. `Point p = (new Line()).getPoint();`
D. `Line.Point p = (new Line()).getPoint();`

Answer: D

QUESTION 25
Given:

```
1. class TestA {
2.     public void start() { System.out.println("TestA"); }
3. }
4. public class TestB extends TestA {
5.     public void start() { System.out.println("TestB"); }
6.     public static void main(String[] args) {
7.         ((TestA)new TestB()).start();
8.     }
9. }
```

What is the result?

A. TestA
B. TestB
C. Compilation fails.
D. An exception is thrown at runtime.

Answer: B

QUESTION 26
Given:

```
11. public static void main(String[] args) {
12.     Object obj = new int[] { 1, 2, 3 };
13.     int[] someArray = (int[])obj;
14.     for (int i : someArray) System.out.print(i + " ");
15. }
```

What is the result?

A. 1 2 3
B. Compilation fails because of an error in line 12.
C. Compilation fails because of an error in line 13.
D. Compilation fails because of an error in line 14.
E. A ClassCastException is thrown at runtime.

Answer: A

QUESTION 27
Click the Exhibit button.

```
1. public class Threads1 {
2.     int x = 0;
```

```
3.      public class Runner implements Runnable {
4.          public void run(){
5.              int current = 0;
6.              for(int i = 0; i<4; i++){
7.                  current = x;
8.                  System.out.println(current + ", ");
9.                  x = current + 2;
10.             }
11.         }
12.     }
13.
14.     public static void main(String[] args) {
15.         new Threads1().go();
16.     }
17.
18.     public void go(){
19.         Runnable r1 = new Runner();
20.         new Thread(r1).start();
21.         new Thread(r1).start();
22.     }
23. }
```

Which two are possible results? (Choose two.)

A. 0, 2, 4, 4, 6, 8, 10, 6,
B. 0, 2, 4, 6, 8, 10, 2, 4,
C. 0, 2, 4, 6, 8, 10, 12, 14,
D. 0, 0, 2, 2, 4, 4, 6, 6, 8, 8, 10, 10, 12, 12, 14, 14,
E. 0, 2, 4, 6, 8, 10, 12, 14, 0, 2, 4, 6, 8, 10, 12, 14,

Answer: C

QUESTION 28
Given:
foo and bar are public references available to many other threads. foo refers to a Thread and bar is an Object.
The thread foo is currently executing bar.wait(). From another thread, what provides the most reliable way to ensure that foo will stop executing wait()?

A. `foo.notify();`
B. `bar.notify();`
C. `foo.notifyAll();`
D. `Thread.notify();`
E. `bar.notifyAll();`
F. `Object.notify();`

Answer: E

QUESTION 29
Given:

```
public class PingPong implements Runnable {
    synchronized void hit(long n) {
        for (int i = 1; i < 3; i++)
            System.out.print(n + "-" + i + " ");
    }
```

```
    public static void main(String[] args) {
        new Thread(new PingPong()).start();
        new Thread(new PingPong()).start();
    }

    public void run() {
        hit(Thread.currentThread().getId());
    }
}
```

Which two statements are true? (Choose two.)

A. The output could be 8-1 7-2 8-2 7-1
B. The output could be 7-1 7-2 8-1 6-1
C. The output could be 8-1 7-1 7-2 8-2
D. The output could be 8-1 8-2 7-1 7-2

Answer: CD

QUESTION 30
Click the Exhibit button.

```
class Computation extends Thread {

    private int num;
    private boolean isComplete;
    private int result;

    public Computation(int num){ this.num = num; }

    public synchronized void run() {
        result = num * 2;
        isComplete = true;
        notify();
    }

    public synchronized int getResult() {
        while ( ! isComplete ){
            try {
                wait();
            } catch (InterruptedException e) {
            }
        }
        return result;
    }

    public static void main(String[] args) {
        Computation[] computations = new Computation[4];
        for (int i = 0; i < computations.length; i++) {
            computations[i] = new Computation(i);
            computations[i].start();
        }
        for (Computation c : computations) {
            System.out.println(c.getResult() + " ");
        }
    }
}
```

What is the result?

A. The code will deadlock.
B. The code may run with no output.
C. An exception is thrown at runtime.
D. The code may run with output "0 6".
E. The code may run with output "2 0 6 4".
F. The code may run with output "0 2 4 6".

Answer: F

Exam F

QUESTION 1
Which two code fragments will execute the method doStuff() in a separate thread? (Choose two.)

A.
```
new Thread() {
    public void run() { doStuff(); }
};
```
B.
```
new Thread() {
    public void start() { doStuff(); }
};
```
C.
```
new Thread() {
    public void start() { doStuff(); }
}.run();
```
D.
```
new Thread() {
    public void run() { doStuff(); }
}.start();
```
E.
```
new Thread(new Runnable() {
    public void run() { doStuff(); }
}).run();
```
F.
```
new Thread(new Runnable() {
    public void run() { doStuff(); }
}).start();
```

Answer: DF

QUESTION 2
Given:

```
public class Person {
    private String name;
    public Person(String name) {
        this.name = name;
    }
    public boolean equals(Object o) {
        if ( ! ( o instanceof Person) ) return false;
        Person p = (Person) o;
        return p.name.equals(this.name);
    }
}
```

Which statement is true?

A. Compilation fails because the hashCode method is not overridden.
B. A HashSet could contain multiple Person objects with the same name.
C. All Person objects will have the same hash code because the hashCode method is not overridden.
D. If a HashSet contains more than one Person object with name="Fred", then removing another Person, also with name="Fred", will remove them all.

Answer: B

QUESTION 3
Given:

```
import java.util.*;
public class SortOf {
    public static void main(String[] args) {
        ArrayList<Integer> a = new ArrayList<Integer>();
        a.add(1); a.add(5); a.add(3);
```

```
        Collections.sort(a);
        a.add(2);
        Collections.reverse(a);
        System.out.println(a);
    }
}
```

What is the result?

A. [1, 2, 3, 5]
B. [2, 1, 3, 5]
C. [2, 5, 3, 1]
D. [5, 3, 2, 1]
E. [1, 3, 5, 2]
F. Compilation fails.
G. An exception is thrown at runtime.

Answer: C

QUESTION 4
Given:

```
public class Person {
    private name;
    public Person(String name) {
        this.name = name;
    }
    public int hashCode() {
        return 420;
    }
}
```

Which statement is true?

A. The time to find the value from HashMap with a Person key depends on the size of the map.
B. Deleting a Person key from a HashMap will delete all map entries for all keys of type Person.
C. Inserting a second Person object into a HashSet will cause the first Person object to be removed as a duplicate.
D. The time to determine whether a Person object is contained in a HashSet is constant and does NOT depend on the size of the map.

Answer: A

QUESTION 5
Given:

```
import java.util.TreeSet;
public class Explorer2 {
    public static void main(String[] args) {
        TreeSet<Integer> s = new TreeSet<Integer>();
        TreeSet<Integer> subs = new TreeSet<Integer>();
        for(int i = 606; i < 613; i++)
            if(i%2 == 0) s.add(i);
        subs = (TreeSet)s.subSet(608, true, 611, true);
        s.add(629);
        System.out.println(s + " " + subs);
    }
}
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. [608, 610, 612, 629] [608, 610]
D. [608, 610, 612, 629] [608, 610, 629]
E. [606, 608, 610, 612, 629] [608, 610]
F. [606, 608, 610, 612, 629] [608, 610, 629]

Answer: E

QUESTION 6
Given:

```
public class Drink implements Comparable {
    public String name;
    public int compareTo(Object o) {
        return 0;
    }
}
```

and:

```
Drink one = new Drink();
Drink two = new Drink();
one.name= "Coffee";
two.name= "Tea";
TreeSet set = new TreeSet();
set.add(one);
set.add(two);
```

A programmer iterates over the TreeSet and prints the name of each Drink object.
What is the result?

A. Tea
B. Coffee
C. Coffee
   Tea
D. Compilation fails.
E. The code runs with no output.
F. An exception is thrown at runtime.

Answer: B

QUESTION 7
A programmer must create a generic class MinMax and the type parameter of MinMax must implement Comparable.
Which implementation of MinMax will compile?

A.
```
class MinMax<E extends Comparable<E>> {
      E min = null;
      E max = null;
      public MinMax() {}
      public void put(E value) { /* store min or max */ }
```

B.
```
class MinMax<E implements Comparable<E>> {
      E min = null;
      E max = null;
      public MinMax() {}
      public void put(E value) { /* store min or max */ }
```

C.
```
class MinMax<E extends Comparable<E>> {
      <E> E min = null;
      <E> E max = null;
      public MinMax() {}
      public <E> void put(E value) { /* store min or max */ }
```
D.
```
class MinMax<E implements Comparable<E>> {
      <E> E min = null;
      <E> E max = null;
      public MinMax() {}
      public <E> void put(E value) { /* store min or max */ }
```

Answer: A

QUESTION 8
Given:
```
1. import java.util.*;
2. public class Example {
3.     public static void main(String[] args) {
4.         // insert code here
5.         set.add(new Integer(2));
6.         set.add(new Integer(1));
7.         System.out.println(set);
8.     }
9. }
```
Which code, inserted at line 4, guarantees that this program will output [1, 2]?

A. Set set = new TreeSet();
B. Set set = new HashSet();
C. Set set = new SortedSet();
D. List set = new SortedList();
E. Set set = new LinkedHashSet();

Answer: AB

QUESTION 9
Given:
```
1.
2.
3.
4.
5. class A {
6.     void foo() throws Exception { throw new Exception(); }
7. }
8. class SubB2 extends A {
9.     void foo() { System.out.println("B "); }
10.}
11.class Tester {
12.    public static void main(String[] args) {
13.        A a = new SubB2();
14.        a.foo();
15.    }
16.}
```
What is the result?

A. B
B. B, followed by an Exception.
C. Compilation fails due to an error on line 9.

D. Compilation fails due to an error on line 14.
E. An Exception is thrown with no other output.

Answer: D

QUESTION 10
Given:

```
try {
    ResourceConnection con = resourceFactory.getConnection();
    Results r = con.query("GET INFO FROM CUSTOMER"); // Linea 86
    info = r.getData(); 88. con.close();
} catch (ResourceException re) {
    errorLog.write(re.getMessage());
}
return info;
```

Which statement is true if a ResourceException is thrown on line 86?

A. Line 92 will not execute.
B. The connection will not be retrieved in line 85.
C. The resource connection will not be closed on line 88.
D. The enclosing method will throw an exception to its caller.

Answer: C

QUESTION 11
Given:

```
public class Breaker {
    static String o = "";

    public static void main(String[] args) {
        z: o = o + 2;
        for (int x = 3; x < 8; x++) {
            if (x == 4)
                break;
            if (x == 6)
                break z;
            o = o + x;
        }
        System.out.println(o);
    }
}
```

What is the result?

A. 23
B. 234
C. 235
D. 2345
E. 2357
F. 23457
G. Compilation fails.

Answer: G

QUESTION 12
Given:

```
public void go(int x) {
    assert (x > 0); //Line 12
    switch(x) {
    case 2: ;
    default: assert false; //Line 15
    }
}
private void go2(int x) { assert (x < 0); } //Line 18
```

Which statement is true?

A. All of the assert statements are used appropriately.
B. Only the assert statement on line 12 is used appropriately.
C. Only the assert statement on line 15 is used appropriately.
D. Only the assert statement on line 18 is used appropriately.
E. Only the assert statements on lines 12 and 15 are used appropriately.
F. Only the assert statements on lines 12 and 18 are used appropriately.
G. Only the assert statements on lines 15 and 18 are used appropriately.

Answer: G

QUESTION 13
Given:

```
public static void main(String[] args) {
    try {
        args = null;
        args[0] = "test";
        System.out.println(args[0]);
    } catch (Exception ex) {
        System.out.println("Exception");
    } catch (NullPointerException npe) {
        System.out.println("NullPointerException");
    }
}
```

What is the result?

A. test
B. Exception
C. Compilation fails.
D. NullPointerException

Answer: C

QUESTION 14
Given:

```
public static void main(String[] args) {
    for (int i = 0; i <= 10; i++) {
        if (i > 6) break;
    }
    System.out.println(i);
}
```

What is the result?

A. 6
B. 7
C. 10

D. 11
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: E

QUESTION 15
Given:

```
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11. class X { public void foo() { System.out.print("X "); } }
12.
13. public class SubB extends X {
14.     public void foo() throws RuntimeException {
15.         super.foo();
16.         if (true) throw new RuntimeException();
17.         System.out.print("B ");
18.     }
19.     public static void main(String[] args) {
20.         new SubB().foo();
21.     }
22. }
```

What is the result?

A. X, followed by an Exception.
B. No output, and an Exception is thrown.
C. Compilation fails due to an error on line 14.
D. Compilation fails due to an error on line 16.
E. Compilation fails due to an error on line 17.
F. X, followed by an Exception, followed by B.

Answer: A

QUESTION 16
Given:

```
public void testIfA() {
    if (testIfB("True")) { //Linea 12
        System.out.println("True");
    } else {
        System.out.println("Not true");
    }
}
public Boolean testIfB(String str) {
    return Boolean.valueOf(str); //Linea 19
}
```

What is the result when method testIfA is invoked?

A. True
B. Not true
C. An exception is thrown at runtime.
D. Compilation fails because of an error at line 12.
E. Compilation fails because of an error at line 19.

Answer: A

QUESTION 17
Which can appropriately be thrown by a programmer using Java SE technology to create a desktop application?

A. ClassCastException
B. NullPointerException
C. NoClassDefFoundError
D. NumberFormatException
E. ArrayIndexOutOfBoundsException

Answer: D

QUESTION 18
Which two code fragments are most likely to cause a StackOverflowError? (Choose two.)

A.
```
int []x = {1,2,3,4,5};
for(int y = 0; y < 6; y++)
    System.out.println(x[y]);
```
B.
```
static int[] x = {7,6,5,4};
static { x[1] = 8;
x[4] = 3; }
```
C.
```
for(int y = 10; y < 10; y++)
    doStuff(y);
```
D.
```
void doOne(int x) { doTwo(x); }
void doTwo(int y) { doThree(y); }
void doThree(int z) { doTwo(z); }
```
E.
```
for(int x = 0; x < 1000000000; x++)
    doStuff(x);
```
F.
```
void counter(int i) { counter(++i); }
```

Answer: DF

QUESTION 19
Given:

```
public static void main(String[] args) {
    Integer i = new Integer(1) + new Integer(2);
    switch(i) {
    case 3: System.out.println("three"); break;
    default: System.out.println("other"); break;
    }
}
```

What is the result?

A. three

B. other
C. An exception is thrown at runtime.
D. Compilation fails because of an error on line 12.
E. Compilation fails because of an error on line 13.
F. Compilation fails because of an error on line 15.

Answer: A

QUESTION 20
Given:

```
public class Tahiti {
    Tahiti t;

    public static void main(String[] args) {
        Tahiti t = new Tahiti();
        Tahiti t2 = t.go(t);
        t2 = null;
        // more code here 11
    }

    Tahiti go(Tahiti t) {
        Tahiti t1 = new Tahiti();
        Tahiti t2 = new Tahiti();
        t1.t = t2;
        t2.t = t1;
        t.t = t2;
        return t1;
    }
}
```

When line 11 is reached, how many objects are eligible for garbage collection?

A. 0
B. 1
C. 2
D. 3
E. Compilation fails.

Answer: A

QUESTION 21
Given:

```
interface Animal {
    void makeNoise();
}

class Horse implements Animal {
    Long weight = 1200L;

    public void makeNoise() {
        System.out.println("whinny");
    }
}

public class Icelandic extends Horse {
    public void makeNoise() {
        System.out.println("vinny");
```

```
    }

    public static void main(String[] args) {
        Icelandic i1 = new Icelandic();
        Icelandic i2 = new Icelandic();
        Icelandic i3 = new Icelandic();
        i3 = i1;
        i1 = i2;
        i2 = null;
        i3 = i1;
    } //Linea 14
}
```

When line 14 is reached, how many objects are eligible for the garbage collector?

A. 0
B. 1
C. 2
D. 3
E. 4
F. 6

Answer: E

QUESTION 22
Given:

```
public class Commander {
    public static void main(String[] args) {
        String myProp = /* insert code here Linea 13 */
        System.out.println(myProp);
    }
}
```

and the command line: **`java -Dprop.custom=gobstopper Commander`**

Which two, placed on line 13, will produce the output gobstopper? (Choose two.)

A. System.load("prop.custom");
B. System.getenv("prop.custom");
C. System.property("prop.custom");
D. System.getProperty("prop.custom");
E. System.getProperties().getProperty("prop.custom");

Answer: DE

QUESTION 23
Given:

```
public class ItemTest {
    private final int id;

    public ItemTest(int id) {
        this.id = id;
    }

    public void updateId(int newId) {
        id = newId;
    }
```

```
    public static void main(String[] args) {
        ItemTest fa = new ItemTest(42);
        fa.updateId(69);
        System.out.println(fa.id);
    }
}
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. The attribute id in the ItemTest object remains unchanged.
D. The attribute id in the ItemTest object is modified to the new value.
E. A new ItemTest object is created with the preferred value in the id attribute.

Answer: A

QUESTION 24
A developer is creating a class Book, that needs to access class Paper.
The Paper class is deployed in a JAR named myLib.jar.
Which three, taken independently, will allow the developer to use the Paper class while compiling the Book class? (Choose three.)

A. The JAR file is located at $JAVA_HOME/jre/classes/myLib.jar.
B. The JAR file is located at $JAVA_HOME/jre/lib/ext/myLib.jar..
C. The JAR file is located at /foo/myLib.jar and a classpath environment variable is set that includes /foo/myLib.jar/Paper.class.
D. The JAR file is located at /foo/myLib.jar and a classpath environment variable is set that includes /foo/myLib.jar.
E. The JAR file is located at /foo/myLib.jar and the Book class is compiled using javac - cp /foo/myLib.jar/Paper Book.java.
F. The JAR file is located at /foo/myLib.jar and the Book class is compiled using javac -d /foo/myLib.jar Book.java
G. The JAR file is located at /foo/myLib.jar and the Book class is compiled using javac - classpath /foo/myLib.jar Book.java

Answer: BDG

QUESTION 25
Given:

```
public class Yippee {
    public static void main(String[] args) {
        for (int x = 1; x < args.length; x++) {
            System.out.print(args[x] + " ");
        }
    }
}
```

and two separate command line invocations: **`java Yippee java Yippee 1 2 3 4`**

What is the result?

A. No output is produced. 1 2 3
B. No output is produced. 2 3 4
C. No output is produced. 1 2 3 4
D. An exception is thrown at runtime. 1 2 3
E. An exception is thrown at runtime. 2 3 4

F. An exception is thrown at runtime. 1 2 3 4

Answer: B

QUESTION 26
Click the Exhibit button.

```
class Foo {
    private int x;
    public Foo( int x ){ this.x = x;}
    public void setX( int x ) { this.x = x; }
    public int getX(){ return x;}
}

public class Gamma {

    static Foo fooBar(Foo foo) {
        foo = new Foo(100);
        return foo;
    }

    public static void main(String[] args) {
        Foo foo = new Foo( 300 );
        System.out.println( foo.getX() + "-");

        Foo fooFoo = fooBar(foo);
        System.out.println(foo.getX() + "-");
        System.out.println(fooFoo.getX() + "-");

        foo = fooBar( fooFoo);
        System.out.println( foo.getX() + "-");
        System.out.println(fooFoo.getX());
    }
}
```

What is the output of the program shown in the exhibit?

A. 300-100-100-100-100
B. 300-300-100-100-100
C. 300-300-300-100-100
D. 300-300-300-300-100

Answer: B

QUESTION 27
Given classes defined in two different files:

```
1. package packageA;
2. public class Message {
3.     String getText() {
4.         return "text";
5.     }
6. }
```

And:

```
1. package packageB;
2.
```

```
3. public class XMLMessage extends packageA.Message {
4.     String getText() {
5.         return "<msg>text</msg>";
6.     }
7.
8.     public static void main(String[] args) {
9.         System.out.println(new XMLMessage().getText());
10.    }
11.}
```

What is the result of executing XMLMessage.main?

A. text
B. Compilation fails.
C. <msg>text</msg>
D. An exception is thrown at runtime.

Answer: C

QUESTION 28
Given:

```
interface Fish {
}

class Perch implements Fish {
}

class Walleye extends Perch {
}

class Bluegill {
}

public class Fisherman {
    public static void main(String[] args) {
        Fish f = new Walleye();
        Walleye w = new Walleye();
        Bluegill b = new Bluegill();
        if (f instanceof Perch)
            System.out.print("f-p ");
        if (w instanceof Fish)
            System.out.print("w-f ");
        if (b instanceof Fish)
            System.out.print("b-f ");
    }
}
```

What is the result?

A. w-f
B. f-p w-f
C. w-f b-f
D. f-p w-f b-f
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: B

QUESTION 29
Given:

```
1. package com.company.application;
2.
3. public class MainClass {
4.     public static void main(String[] args) {
5.     }
6. }
```

And MainClass exists in the /apps/com/company/application directory.
Assume the CLASSPATH environment variable is set to "." (current directory).
Which two java commands entered at the command line will run MainClass? (Choose two.)

A. java MainClass if run from the /apps directory
B. java com.company.application.MainClass if run from the /apps directory
C. java -classpath /apps com.company.application.MainClass if run from any directory
D. java -classpath . MainClass if run from the /apps/com/company/application directory
E. java -classpath /apps/com/company/application:. MainClass if run from the /apps directory
F. java com.company.application.MainClass if run from the /apps/com/company/application directory

Answer: BC

QUESTION 30
Given

```
class Foo {
    static void alpha() {
        /* more code here */
    }

    void beta() {
        /* more code here */
    }
}
```

Which two statements are true? (Choose two.)

A. Foo.beta() is a valid invocation of beta().
B. Foo.alpha() is a valid invocation of alpha().
C. Method beta() can directly call method alpha().
D. Method alpha() can directly call method beta().

Answer: BC

QUESTION 31
Given:

```
1. public class TestSeven extends Thread {
2.     private static int x;
3.     public synchronized void doThings() {
4.         int current = x;
5.         current++;
6.         x = current;
7.     }
8.     public void run() {
9.         doThings();
10.    }
11.}
```

Which statement is true?

A. Compilation fails.
B. An exception is thrown at runtime.
C. Synchronizing the run() method would make the class thread-safe.
D. The data in variable "x" are protected from concurrent access problems.
E. Declaring the doThings() method as static would make the class thread-safe.
F. Wrapping the statements within doThings() in a synchronized(new Object()) { } block would make the class thread-safe.

Answer: E

Exam G

QUESTION 1
Given that the current directory is empty, and that the user has read and write privileges to the current directory, and the following:

```
1. import java.io.*;
2. public class Maker {
3.     public static void main(String[] args) {
4.         File dir = new File("dir");
5.         File f = new File(dir, "f");
6.     }
7. }
```

Which statement is true?

A. Compilation fails.
B. Nothing is added to the file system.
C. Only a new file is created on the file system.
D. Only a new directory is created on the file system.
E. Both a new file and a new directory are created on the file system.

Answer: B

QUESTION 2
Given:

```
NumberFormat nf = NumberFormat.getInstance();
nf.setMaximumFractionDigits(4);
nf.setMinimumFractionDigits(2);
String a = nf.format(3.1415926);
String b = nf.format(2);
```

Which two statements are true about the result if the default locale is Locale.US? (Choose two.)

A. The value of b is 2.
B. The value of a is 3.14.
C. The value of b is 2.00.
D. The value of a is 3.141.
E. The value of a is 3.1415.
F. The value of a is 3.1416.
G. The value of b is 2.0000.

Answer: CF

QUESTION 3
Which three statements concerning the use of the **`java.io.Serializable`** interface are true? (Choose three.)

A. Objects from classes that use aggregation cannot be serialized.
B. An object serialized on one JVM can be successfully deserialized on a different JVM.
C. The values in fields with the volatile modifier will NOT survive serialization and deserialization.
D. The values in fields with the transient modifier will NOT survive serialization and deserialization.
E. It is legal to serialize an object of a type that has a supertype that does NOT implement java.io. Serializable.

Answer: BDE

QUESTION 4
Given:

```
12. String csv = "Sue,5,true,3";
13. Scanner scanner = new Scanner( csv );
14. scanner.useDelimiter(",");
15. int age = scanner.nextInt();
```

What is the result?

A. Compilation fails.
B. After line 15, the value of age is 5.
C. After line 15, the value of age is 3.
D. An exception is thrown at runtime.

Answer: D

QUESTION 5
Given that c is a reference to a valid java.io.Console object, which two code fragments read a line of text from the console? (Choose two.)

A. `String s = c.readLine();`
B. `char[] c = c.readLine();`
C. `String s = c.readConsole();`
D. `char[] c = c.readConsole();`
E. `String s = c.readLine("%s", "name ");`
F. `char[] c = c.readLine("%s", "name ");`

Answer: AE

QUESTION 6
Given:

```
11. String test = "a1b2c3";
12. String[] tokens = test.split("\\d");
13. for(String s: tokens) System.out.print(s + " ");
```

What is the result?

A. a b c
B. 1 2 3
C. a1b2c3
D. a1 b2 c3
E. Compilation fails.
F. The code runs with no output.
G. An exception is thrown at runtime.

Answer: A

QUESTION 7
Given:

```
33. Date d = new Date(0);
34. String ds = "December 15, 2004";
35. // insert code here
36. try {
37.     d = df.parse(ds);
38. }
39. catch(ParseException e) {
40.     System.out.println("Unable to parse " + ds);
41. }
42. // insert code here too
```

What creates the appropriate DateFormat object and adds a day to the Date object?

A. 35. DateFormat df = DateFormat.getDateFormat();
   42. d.setTime((60 * 60 * 24) + d.getTime());
B. 35. DateFormat df = DateFormat.getDateInstance();
   42. d.setTime((1000 * 60 * 60 * 24) + d.getTime());
C. 35. DateFormat df = DateFormat.getDateFormat();
   42. d.setLocalTime((1000*60*60*24) + d.getLocalTime());
D. 35. DateFormat df = DateFormat.getDateInstance();
   42. d.setLocalTime((60 * 60 * 24) + d.getLocalTime());

Answer: B

QUESTION 8
Given:

```
1. public class KungFu {
2.     public static void main(String[] args) {
3.         Integer x = 400;
4.         Integer y = x;
5.         x++;
6.         StringBuilder sb1 = new StringBuilder("123");
7.         StringBuilder sb2 = sb1;
8.         sb1.append("5");
9.         System.out.println((x == y) + " " + (sb1 == sb2));
10.    }
11.}
```

What is the result?

A. true true
B. false true
C. true false
D. false false
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: B

QUESTION 9
Given:

```
class Converter {
    public static void main(String[] args) {
        Integer i = args[0];
        int j = 12;
        System.out.println("It is " + (j == i) + " that j==i.");
    }
}
```

What is the result when the programmer attempts to compile the code and run it with the command java

Converter 12?

A. It is true that j==i.
B. It is false that j==i.
C. An exception is thrown at runtime.
D. Compilation fails because of an error in line 13.

Answer: D

QUESTION 10
Given

```
class Foo {
    static void alpha() {
        /* more code here */
    }

    void beta() {
        /* more code here */
    }
}
```

Which two statements are true? (Choose two.)

A. Foo.beta() is a valid invocation of beta().
B. Foo.alpha() is a valid invocation of alpha().
C. Method beta() can directly call method alpha().
D. Method alpha() can directly call method beta().

Answer: BC

QUESTION 11
Click the Exhibit button.

```
1. public class A {
2.     public String doit(int x, int y){
3.         return "a";
4.     }
5.
6.     public String doit(int... vals){
7.         return "b";
8.     }
9. }
```

Given:

```
25.  A a = new A();
26.  System.out.println(a.doit(4, 5));
```

What is the result?

A. Line 26 prints "a" to System.out.
B. Line 26 prints "b" to System.out.
C. An exception is thrown at line 26 at runtime.
D. Compilation of class A will fail due to an error in line 6.

Answer: A

QUESTION 12
Which two code fragments correctly create and initialize a static array of int elements? (Choose two.)

A. `static final int[] a = { 100,200 };`
B. `static final int[] a; static { a=new int[2]; a[0]=100; a[1]=200; }`
C. `static final int[] a = new int[2]{ 100,200 };`
D.
```
static final int[] a;
static void init() { a = new int[3]; a[0]=100; a[1]=200; }
```

Answer: AB

QUESTION 13
Given:

```
1. public class Plant {
2.     private String name;
3.
4.     public Plant(String name) {
5.         this.name = name;
6.     }
7.
8.     public String getName() {
9.         return name;
10.    }
11.}
```

```
1. public class Tree extends Plant {
2.     public void growFruit() {
3.     }
4.
5.     public void dropLeaves() {
6.     }
7. }
```

Which statement is true?

A. The code will compile without changes.
B. The code will compile if public Tree() { Plant(); } is added to the Tree class.
C. The code will compile if public Plant() { Tree(); } is added to the Plant class.
D. The code will compile if public Plant() { this("fern"); } is added to the Plant class.
E. The code will compile if public Plant() { Plant("fern"); } is added to the Plant class.

Answer: D

QUESTION 14
Click the Exhibit button.

```
1. public class GoTest {
2.     public static void main(String[] args) {
3.         Sente a = new Sente(); a.go();
4.         Goban b = new Goban(); b.go();
5.         Stone c = new Stone(); c.go();
6.     }
7. }
8.
9. class Sente implements Go {
10.    public void go(){
```

```
11.         System.out.println("go in Sente");
12.     }
13. }
14.
15. class Goban extends Sente {
16.     public void go(){
17.         System.out.println("go in Goban");
18.     }
19.
20. }
21. class Stone extends Goban implements Go{
22. }
23.
24. interface Go { public void go(); }
```

What is the result?

A. go in Goban go in Sente go in Sente
B. go in Sente go in Sente go in Goban
C. go in Sente go in Goban go in Goban
D. go in Goban go in Goban go in Sente
E. Compilation fails because of an error in line 17.

Answer: C

QUESTION 15
Which two classes correctly implement both the `java.lang.Runnable` and the `java.lang.Cloneable` interfaces? (Choose two.)

A.
```
public class Session implements Runnable, Cloneable {
    public void run();

    public Object clone();
}
```
B.
```
public class Session extends Runnable, Cloneable {
    public void run() { /* do something */ }
    public Object clone() { /* make a copy */ }
}
```
C.
```
public class Session implements Runnable, Cloneable {
    public void run() { /* do something */ }
    public Object clone() { /* make a copy */ }
}
```
D.
```
public abstract class Session implements Runnable, Cloneable {
    public void run() { /* do something */ }
    public Object clone() { /*make a copy */ }
}
```
E.
```
public class Session implements Runnable, implements Cloneable {
    public void run() { /* do something */ }
    public Object clone() { /* make a copy */ }
}
```

Answer: CD

QUESTION 16
Given:

```
public interface A111 {
    String s = "yo";
```

```
    public void method1();
}

interface B {
}

interface C extends A111, B {
    public void method1();

    public void method1(int x);
}
```

What is the result?

A. Compilation succeeds.
B. Compilation fails due to multiple errors.
C. Compilation fails due to an error only on line 20.
D. Compilation fails due to an error only on line 21.
E. Compilation fails due to an error only on line 22.
F. Compilation fails due to an error only on line 12.

Answer: A

QUESTION 17
Click the Exhibit button.

```
1.
2.
3.
4.
5.
6.
7.
8.
9.
10. interface Foo{
11.     int bar();
12. }
13.
14. public class Beta {
15.
16.     class A implements Foo {
17.         public int bar(){ return 1; }
18.     }
19.
20.     public int fubar(Foo foo){ return foo.bar(); }
21.
22.     public void testFoo(){
23.
24.         class A implements Foo{
25.             public int bar(){return 2;}
26.         }
27.
28.         System.out.println(fubar(new A()));
29.     }
30.
31.     public static void main(String[] args) {
32.         new Beta().testFoo();
33.     }
34. }
```

Which three statements are true? (Choose three.)

A. Compilation fails.
B. The code compiles and the output is 2.
C. If lines 16, 17 and 18 were removed, compilation would fail.
D. If lines 24, 25 and 26 were removed, compilation would fail.
E. If lines 16, 17 and 18 were removed, the code would compile and the output would be 2.
F. If lines 24, 25 and 26 were removed, the code would compile and the output would be 1.

Answer: BEF

QUESTION 18
Given:

```
class Alpha {
    public void foo() { System.out.print("Afoo "); }
}
public class Beta extends Alpha {
    public void foo() { System.out.print("Bfoo "); }
    public static void main(String[] args) {
        Alpha a = new Beta();
        Beta b = (Beta)a;
        a.foo();
        b.foo();
    }
}
```

What is the result?

A. Afoo Afoo
B. Afoo Bfoo
C. Bfoo Afoo
D. Bfoo Bfoo
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: D

QUESTION 19
Given:

```
1. public class TestOne {
2.     public static void main (String[] args) throws Exception {
3.         Thread.sleep(3000);
4.         System.out.println("sleep");
5.     }
6. }
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. The code executes normally and prints "sleep".
D. The code executes normally, but nothing is printed.

Answer: C

QUESTION 20
Given:

```
1. public class Threads3 implements Runnable {
2.     public void run() {
3.         System.out.print("running");
4.     }
5.     public static void main(String[] args) {
6.         Thread t = new Thread(new Threads3());
7.         t.run();
8.         t.run();
9.         t.start();
10.    }
11.}
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. The code executes and prints "running".
D. The code executes and prints "runningrunning".
E. The code executes and prints "runningrunningrunning".

Answer: E

QUESTION 21
Given:

```
public class NamedCounter {
    private final String name;
    private int count;

    public NamedCounter(String name) {
        this.name = name;
    }

    public String getName() {
        return name;
    }

    public void increment() {
        count++;
    }

    public int getCount() {
        return count;
    }

    public void reset() {
        count = 0;
    }
}
```

Which three changes should be made to adapt this class to be used safely by multiple threads? (Choose three.)

A. declare reset() using the synchronized keyword
B. declare getName() using the synchronized keyword
C. declare getCount() using the synchronized keyword
D. declare the constructor using the synchronized keyword
E. declare increment() using the synchronized keyword

Answer: ACE

QUESTION 22
Given that Triangle implements Runnable, and:

```
void go() throws Exception {
    Thread t = new Thread(new Triangle());
    t.start();
    for(int x = 1; x < 100000; x++) {
        //insert code here Linea 35
        if(x%100 == 0) System.out.print("g");
    }
}

public void run() {
    try {
        for(int x = 1; x < 100000; x++) {
            // insert the same code here Linea 41
            if(x%100 == 0) System.out.print("t");
        }
    } catch (Exception e) {

    }
}
```

Which two statements, inserted independently at both lines 35 and 41, tend to allow both threads to temporarily pause and allow the other thread to execute? (Choose two.)

A. Thread.wait();
B. Thread.join();
C. Thread.yield();
D. Thread.sleep(1);
E. Thread.notify();

Answer: CD

QUESTION 23
Given:

```
1. public class TestSeven extends Thread {
2.     private static int x;
3.     public synchronized void doThings() {
4.         int current = x;
5.         current++;
6.         x = current;
7.     }
8.     public void run() {
9.         doThings();
10.    }
11.}
```

Which statement is true?

A. Compilation fails.
B. An exception is thrown at runtime.
C. Synchronizing the run() method would make the class thread-safe.
D. The data in variable "x" are protected from concurrent access problems.
E. Declaring the doThings() method as static would make the class thread-safe.
F. Wrapping the statements within doThings() in a synchronized(new Object()) { } block would make the class thread-safe.

Answer: E

QUESTION 24
Given:

```
public class Yikes {

    public static void go(Long n) {
        System.out.print("Long ");
    }

    public static void go(Short n) {
        System.out.print("Short ");
    }

    public static void go(int n) {
        System.out.print("int ");
    }

    public static void main(String[] args) {
        short y = 6;
        long z = 7;
        go(y);
        go(z);
    }
}
```

What is the result?

A. int Long
B. Short Long
C. Compilation fails.
D. An exception is thrown at runtime.

Answer: A

QUESTION 25
Given:

```
12. Date date = new Date();
13. df.setLocale(Locale.ITALY);
14. String s = df.format(date);
```

The variable df is an object of type DateFormat that has been initialized in line 11.
What is the result if this code is run on December 14, 2000?

A. The value of s is 14-dic-2000.
B. The value of s is Dec 14, 2000.
C. An exception is thrown at runtime.
D. Compilation fails because of an error in line 13.

Answer: D

QUESTION 26
Which two scenarios are NOT safe to replace a StringBuffer object with a StringBuilder object? (Choose two.)

A. When using versions of Java technology earlier than 5.0.
B. When sharing a StringBuffer among multiple threads.

C. When using the java.io class StringBufferInputStream.
D. When you plan to reuse the StringBuffer to build more than one string.

Answer: AB

QUESTION 27
Given that c is a reference to a valid java.io.Console object, and:

```
11. String pw = c.readPassword("%s", "pw: ");
12. System.out.println("got " + pw);
13. String name = c.readLine("%s", "name: ");
14. System.out.println(" got ", name);
```

If the user types fido when prompted for a password, and then responds bob when prompted for a name, what is the result?

A. pw: got fido name: bob got bob
B. pw: fido got fido name: bob got bob
C. pw: got fido name: bob got bob
D. pw: fido got fido name: bob got bob
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: E

QUESTION 28
Given:

```
11. String test = "This is a test";
12. String[] tokens = test.split("\s");
13. System.out.println(tokens.length);
```

What is the result?

A. 0
B. 1
C. 4
D. Compilation fails.
E. An exception is thrown at runtime.

Answer: D

QUESTION 29
Given:

```
import java.io.*;

class Animal {
    Animal() {
        System.out.print("a");
    }
}

class Dog extends Animal implements Serializable {
    Dog() {
        System.out.print("d");
    }
```

```
}

public class Beagle extends Dog {
}
```

If an instance of class Beagle is created, then Serialized, then deSerialized, what is the result?

A. ad
B. ada
C. add
D. adad
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: B

QUESTION 30
Given:

```
11. double input = 314159.26;
12. NumberFormat nf = NumberFormat.getInstance(Locale.ITALIAN);
13. String b;
14. //insert code here
```

Which code, inserted at line 14, sets the value of b to 314.159,26?

A. b = nf.parse(input);
B. b = nf.format(input);
C. b = nf.equals(input);
D. b = nf.parseObject(input);

Answer: B

QUESTION 31
A team of programmers is involved in reviewing a proposed design for a new utility class. After some discussion, they realize that the current design allows other classes to access methods in the utility class that should be accessible only to methods within the utility class itself.

What design issue has the team discovered?

A. Tight coupling
B. Low cohesion
C. High cohesion
D. Loose coupling
E. Weak encapsulation
F. Strong encapsulation

Answer: E

QUESTION 32
Given a method that must ensure that its parameter is not null:

```
11. public void someMethod(Object value) {
12. // check for null value
...
20. System.out.println(value.getClass());
```

```
21. }
```

What, inserted at line 12, is the appropriate way to handle a null value?

A. assert value == null;
B. assert value != null, "value is null";
C. if (value == null) { throw new AssertionException("value is null"); }
D. if (value == null) { throw new IllegalArgumentException("value is null"); }

Answer: D

Exam H

QUESTION 1
Given:

```
1. public class Target {
2.     private int i = 0;
3.     public int addOne() {
4.         return ++i;
5.     }
6. }
```

And:

```
1. public class Client {
2.     public static void main(String[] args){
3.         System.out.println(new Target().addOne());
4.     }
5. }
```

Which change can you make to Target without affecting Client?

A. Line 4 of class Target can be changed to return i++;
B. Line 2 of class Target can be changed to private int i = 1;
C. Line 3 of class Target can be changed to private int addOne(){
D. Line 2 of class Target can be changed to private Integer i = 0;

Answer: D

QUESTION 2
Given:

```
class Animal {
    public String noise() {
        return "peep";
    }
}

class Dog extends Animal {
    public String noise() {
        return "bark";
    }
}

class Cat extends Animal {
    public String noise() {
        return "meow";
    }
}
...

30. Animal animal = new Dog();
31. Cat cat = (Cat)animal;
32. System.out.println(cat.noise());
```

What is the result?

A. peep
B. bark
C. meow

D. Compilation fails.
E. An exception is thrown at runtime.

Answer: E

QUESTION 3
Given:

```
abstract class A {
    abstract void a1();

    void a2() {
    }
}

class B extends A {
    void a1() {
    }

    void a2() {
    }
}

class C extends B {
    void c1() {
    }
}
```

And:

```
A x = new B();
C y = new C();
A z = new C();
```

What are four valid examples of polymorphic method calls? (Choose four.)

A. x.a2();
B. z.a2();
C. z.c1();
D. z.a1();
E. y.c1();
F. x.a1();

Answer: ABDF

QUESTION 4
Given:

```
class Employee {
    String name;
    double baseSalary;

    Employee(String name, double baseSalary) {
        this.name = name;
        this.baseSalary = baseSalary;
    }
}

public class SalesPerson extends Employee {
    double commission;
```

```
    public SalesPerson(String name, double baseSalary, double commission) {
        // insert code here Line 13
    }
}
```

Which two code fragments, inserted independently at line 13, will compile? (Choose two.)

A. super(name, baseSalary);
B. this.commission = commission;
C. super(); this.commission = commission;
D. this.commission = commission; super();
E. super(name, baseSalary); this.commission = commission;
F. this.commission = commission; super(name, baseSalary);
G. super(name, baseSalary, commission);

Answer: AE

QUESTION 5
A team of programmers is involved in reviewing a proposed design for a new utility class.
After some discussion, they realize that the current design allows other classes to access methods in the utility class that should be accessible only to methods within the utility class itself.

What design issue has the team discovered?

A. Tight coupling
B. Low cohesion
C. High cohesion
D. Loose coupling
E. Weak encapsulation
F. Strong encapsulation

Answer: E

QUESTION 6
Given that:
Gadget has-a Sprocket and Gadget has-a Spring and Gadget is-a Widget and Widget has-a Sprocket
Which two code fragments represent these relationships? (Choose two.)

A.
```
class Widget {
    Sprocket s;
}

class Gadget extends Widget {
    Spring s;
}
```
B.
```
class Widget {
}

class Gadget extends Widget {
    Spring s1;
    Sprocket s2;
}
```

C.
```
class Widget {
    Sprocket s1;
    Spring s2;
}

class Gadget extends Widget {
}
```
D.
```
class Gadget {
    Spring s;
}

class Widget extends Gadget {
    Sprocket s;
}
```
E.
```
class Gadget {
}

class Widget extends Gadget {
    Sprocket s1;
    Spring s2;
}
```
F.
```
class Gadget {
    Spring s1;
    Sprocket s2;
}

class Widget extends Gadget {
}
```

Answer: AC

QUESTION 7
Given:

```
class Pizza {
    java.util.ArrayList toppings;

    public final void addTopping(String topping) {
        toppings.add(topping);
    }
    public void removeTopping(String topping) {
        toppings.remove(topping);
    }
}

public class PepperoniPizza extends Pizza {
    public void addTopping(String topping) {
        System.out.println("Cannot add Toppings");
    }

    public static void main(String[] args) {
        Pizza pizza = new PepperoniPizza();
        pizza.addTopping("Mushrooms");
        pizza.removeTopping("Peperoni");
    }

}
```

What is the result?

A. Compilation fails.
B. Cannot add Toppings
C. The code runs with no output.

D. A NullPointerException is thrown in Line 4.

Answer: A

QUESTION 8
Which three statements are true? (Choose three.)

A. A final method in class X can be abstract if and only if X is abstract.
B. A protected method in class X can be overridden by any subclass of X.
C. A private static method can be called only within other static methods in class X.
D. A non-static public final method in class X can be overridden in any subclass of X.
E. A public static method in class X can be called by a subclass of X without explicitly referencing the class X.
F. A method with the same signature as a private final method in class X can be implemented in a subclass of X.
G. A protected method in class X can be overridden by a subclass of X only if the subclass is in the same package as X.

Answer: BEF

QUESTION 9
Click the Exhibit button.

```
1. public class Car {
2.     private int wheelCount;
3.     private String vin;
4.     public Car(String vin){
5.         this.vin = vin;
6.         this.wheelCount = 4;
7.     }
8.     public String drive(){
9.         return "zoom-zoom";
10.    }
11.    public String getInfo() {
12.        return "VIN: " + vin + " wheels: " + wheelCount;
13.    }
14.}
```

And

```
1. public class MeGo extends Car {
2.     public MeGo(String vin) {
3.         this.wheelCount = 3;
4.     }
5. }
```

What two must the programmer do to correct the compilation errors? (Choose two.)

A. insert a call to this() in the Car constructor
B. insert a call to this() in the MeGo constructor
C. insert a call to super() in the MeGo constructor
D. insert a call to super(vin) in the MeGo constructor
E. change the wheelCount variable in Car to protected
F. change line 3 in the MeGo class to super.wheelCount = 3;

Answer: DE

QUESTION 10
Click the Exhibit button.

```
1. import java.util.*;
2. public class TestSet{
3.     enum Example {ONE, TWO, THREE }
4.     public static void main(String[] args) {
5.         Collection coll = new ArrayList();
6.         coll.add(Example.THREE);
7.         coll.add(Example.THREE);
8.         coll.add(Example.THREE);
9.         coll.add(Example.TWO);
10.        coll.add(Example.TWO);
11.        coll.add(Example.ONE);
12.        Set set = new HashSet(coll);
13.    }
14.}
```

Which statement is true about the set variable on line 12?

A. The set variable contains all six elements from the coll collection, and the order is guaranteed to be preserved.
B. The set variable contains only three elements from the coll collection, and the order is guaranteed to be preserved.
C. The set variable contains all six elements from the coll collection, but the order is NOT guaranteed to be preserved.
D. The set variable contains only three elements from the coll collection, but the order is NOT guaranteed to be preserved.

Answer: D

QUESTION 11
Given:

```
public class Person {
    private String name, comment;
    private int age;

    public Person(String n, int a, String c) {
        name = n;
        age = a;
        comment = c;
    }

    public boolean equals(Object o) {
        if (!(o instanceof Person))
            return false;
        Person p = (Person) o;
        return age == p.age && name.equals(p.name);
    }
}
```

What is the appropriate definition of the hashCode method in class Person?

A. return super.hashCode();
B. return name.hashCode() + age * 7;
C. return name.hashCode() + comment.hashCode() / 2;

D. return name.hashCode() + comment.hashCode() / 2 - age * 3;

Answer: B

QUESTION 12
Given:

```
public class Key {
    private long id1;
    private long id2;

    // class Key methods
}
```

A programmer is developing a class Key, that will be used as a key in a standard java.util.HashMap.
Which two methods should be overridden to assure that Key works correctly as a key? (Choose two.)

A. public int hashCode()
B. public boolean equals(Key k)
C. public int compareTo(Object o)
D. public boolean equals(Object o)
E. public boolean compareTo(Key k)

Answer: AD

QUESTION 13
Given:

```
import java.util.*;
public class Hancock {
        // insert code here Linea 5
        list.add("foo");
    }
}
```

Which two code fragments, inserted independently at line 5, will compile without warnings? (Choose two.)

A. public void addStrings(List list) {
B. public void addStrings(List<String> list) {
C. public void addStrings(List<? super String> list) {
D. public void addStrings(List<? extends String> list) { B,C

Answer: BC

QUESTION 14
A programmer has an algorithm that requires a java.util.List that provides an efficient implementation of add (0, object), but does NOT need to support quick random access.
What supports these requirements?

A. java.util.Queue
B. java.util.ArrayList
C. java.util.LinearList
D. java.util.LinkedList

Answer: D

QUESTION 15
Given a class whose instances, when found in a collection of objects, are sorted by using the compareTo() method, which two statements are true? (Choose two.)

A. The class implements java.lang.Comparable.
B. The class implements java.util.Comparator.
C. The interface used to implement sorting allows this class to define only one sort sequence.
D. The interface used to implement sorting allows this class to define many different sort sequences.

Answer: AC

QUESTION 16
Given:

```
1. import java.util.*;
2.
3. public class Explorer3 {
4.     public static void main(String[] args) {
5.         TreeSet<Integer> s = new TreeSet<Integer>();
6.         TreeSet<Integer> subs = new TreeSet<Integer>();
7.         for (int i = 606; i < 613; i++)
8.             if (i % 2 == 0)
9.                 s.add(i);
10.        subs = (TreeSet) s.subSet(608, true, 611, true);
11.        subs.add(629);
12.        System.out.println(s + " " + subs);
13.    }
14.}
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. [608, 610, 612, 629] [608, 610]
D. [608, 610, 612, 629] [608, 610, 629]
E. [606, 608, 610, 612, 629] [608, 610]
F. [606, 608, 610, 612, 629] [608, 610, 629]

Answer: B

QUESTION 17
Given:

```
1. import java.util.*;
2.
3. public class LetterASort {
4.     public static void main(String[] args) {
5.         ArrayList<String> strings = new ArrayList<String>();
6.         strings.add("aAaA");
7.         strings.add("AaA");
8.         strings.add("aAa");
9.         strings.add("AAaa");
10.        Collections.sort(strings);
11.        for (String s : strings) {
12.            System.out.print(s + " ");
13.        }
```

```
14.     }
15. }
```

What is the result?

A. Compilation fails.
B. aAaA aAa AAaa AaA
C. AAaa AaA aAa aAaA
D. AaA AAaa aAaA aAa
E. aAa AaA aAaA AAaa
F. An exception is thrown at runtime.

Answer: C

QUESTION 18
Given:

```
1. class A {
2.     void foo() throws Exception {
3.         throw new Exception();
4.     }
5. }
6.
7. class SubB2 extends A {
8.     void foo() {
9.         System.out.println("B ");
10.    }
11.}
12.class Tester {
13.    public static void main(String[] args) {
14.        A a = new SubB2();
15.        a.foo();
16.    }
17.}
```

What is the result?

A. B
B. B, followed by an Exception.
C. Compilation fails due to an error on line 9.
D. Compilation fails due to an error on line 15.
E. An Exception is thrown with no other output

Answer: D

QUESTION 19
Given a method that must ensure that its parameter is not null:

```
11. public void someMethod(Object value) {
12. // check for null value
...
20. System.out.println(value.getClass());
21. }
```

What, inserted at line 12, is the appropriate way to handle a null value?

A. assert value == null;
B. assert value != null, "value is null";
C. if (value == null) { throw new AssertionException("value is null"); }
D. if (value == null) { throw new IllegalArgumentException("value is null"); }

Answer: D

QUESTION 20
Given:

```
1. public class Mule {
2.     public static void main(String[] args) {
3.         boolean assert = true;
4.         if(assert) {
5.             System.out.println("assert is true");
6.         }
7.     }
8. }
```

Which command-line invocations will compile?

A. javac Mule.java
B. javac -source 1.3 Mule.java
C. javac -source 1.4 Mule.java
D. javac -source 1.5 Mule.java

Answer: B

QUESTION 21
Click the Exhibit button

```
1. public class A {
2.     public void method1(){
3.         B b = new B();
4.         b.method2();
5.         // more code here
6.     }
7. }
```

```
1. public class B{
2.     public void method2() {
3.         C c = new C();
4.         c.method3();
5.         // more code here
6.     }
7. }
```

```
1. public class C {
2.     public void method3(){
3.         // more code here
4.     }
5. }
```

Given:

```
        try {
            A a = new A();
```

```
            a.method1();
        } catch (Exception e) {
            System.out.print("an error occurred");
        }
```

Which two statements are true if a NullPointerException is thrown on line 3 of class C? (Choose two.)

A. The application will crash.
B. The code on line 29 will be executed.
C. The code on line 5 of class A will execute.
D. The code on line 5 of class B will execute.
E. The exception will be propagated back to line 27.

Answer: BE

QUESTION 22
Given:

```
1. public class Venus {
2.     public static void main(String[] args) {
3.         int[] x = { 1, 2, 3 };
4.         int y[] = { 4, 5, 6 };
5.         new Venus().go(x, y);
6.     }
7.
8.     void go(int[]... z) {
9.         for (int[] a : z)
10.            System.out.print(a[0]);
11.    }
12.}
```

What is the result?

A. 1
B. 12
C. 14
D. 123
E. Compilation fails.
F. An exception is thrown at runtime.

Answer: C

QUESTION 23
Given:

```
1. public class Test {
2.     public enum Dogs {collie, harrier, shepherd};
3.     public static void main(String [] args) {
4.         Dogs myDog = Dogs.shepherd;
5.         switch (myDog) {
6.         case collie:
7.             System.out.print("collie ");
8.         case default:
9.             System.out.print("retriever ");
10.        case harrier:
11.            System.out.print("harrier ");
12.        }
13.    }
```

14. }
What is the result?

A. harrier
B. shepherd
C. retriever
D. Compilation fails.
E. retriever harrier
F. An exception is thrown at runtime.

Answer: D

QUESTION 24
Given:

```
 static void test() {
    try {
        String x = null;
        System.out.print(x.toString() + " ");
    } finally {
        System.out.print("finally ");
    }
}

public static void main(String[] args) {
    try {
        test();
    } catch (Exception ex) {
        System.out.print("exception ");
    }
}
```

What is the result?

A. null
B. finally
C. null finally
D. Compilation fails.
E. finally exception

Answer: E

QUESTION 25
Given:

```
1. public class Breaker2 {
2.     static String o = "";
3.
4.     public static void main(String[] args) {
5.         z: for (int x = 2; x < 7; x++) {
6.             if (x == 3)
7.                 continue;
8.             if (x == 5)
9.                 break z;
10.            o = o + x;
11.        }
12.        System.out.println(o);
```

```
13.     }
14. }
15.
```
What is the result?

A. 2
B. 24
C. 234
D. 246
E. 2346
F. Compilation fails.

Answer: B

QUESTION 26
Given:

```
    public static void main(String[] args) {
        String str = "null";
        if (str == null) {
            System.out.println("null");
        } else (str.length() == 0) {
            System.out.println("zero");

        } else {
            System.out.println("some");
        }
    }
```

What is the result?

A. null
B. zero
C. some
D. Compilation fails.
E. An exception is thrown at runtime.

Answer: D

QUESTION 27
Given:

```
1. import java.io.IOException;
2.
3. class A {
4.
5.     public void process() {
6.         System.out.print("A,");
7.     }
8.
9. }
10.
11.
12.class B extends A {
13.
14.     public void process() throws IOException {
15.         super.process();
16.         System.out.print("B,");
```

```
17.         throw new IOException();
18.     }
19.
20.     public static void main(String[] args) {
21.         try {
22.             new B().process();
23.         } catch (IOException e) {
24.             System.out.println("Exception");
25.         }
26.     }
27. }
```

What is the result?

A. Exception
B. A,B,Exception
C. Compilation fails because of an error in line 20.
D. Compilation fails because of an error in line 14.
E. A NullPointerException is thrown at runtime.

Answer: D

QUESTION 28
Given:

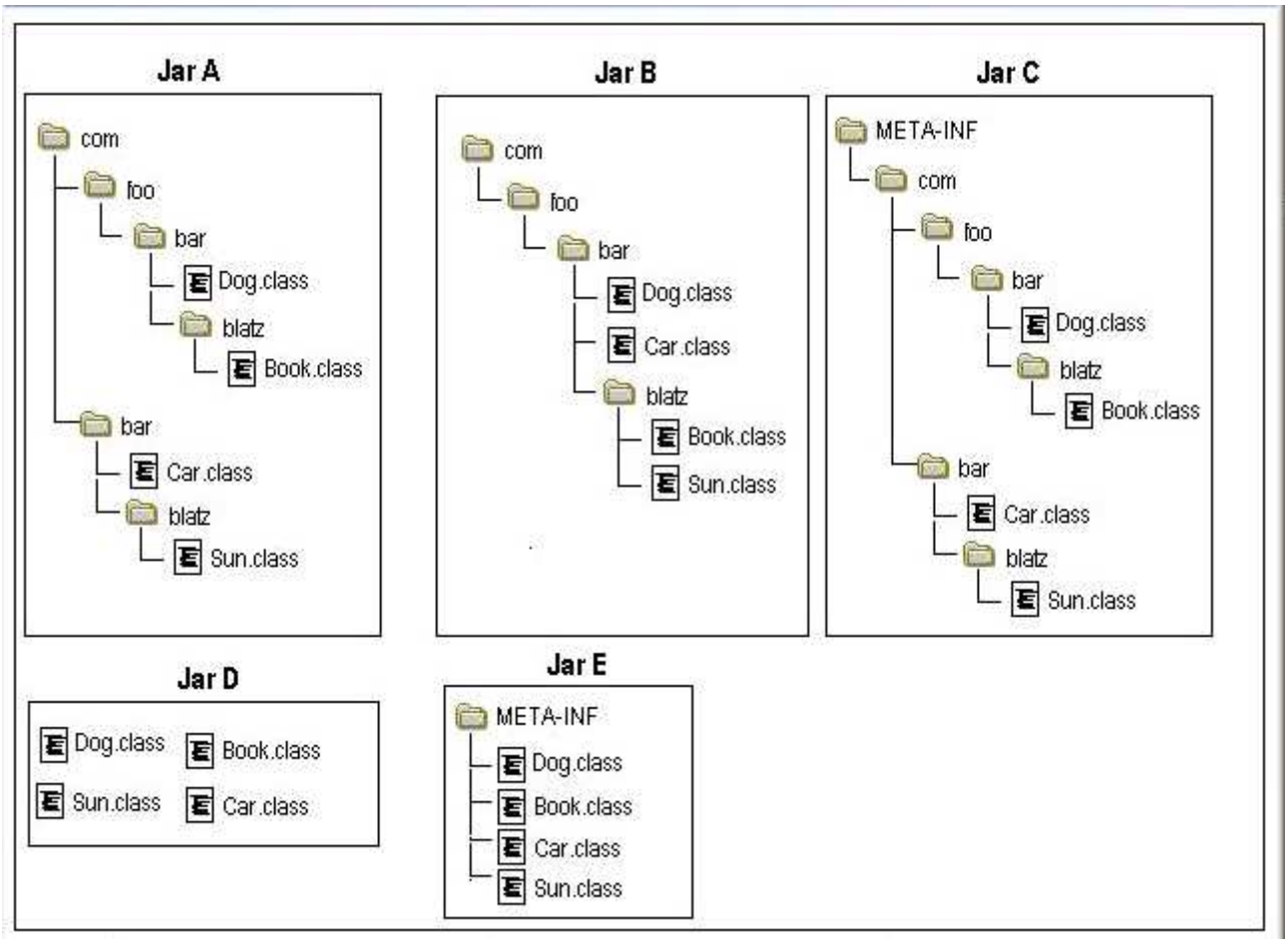
```
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.    public void genNumbers() {
12.         ArrayList numbers = new ArrayList();
13.         for (int i = 0; i < 10; i++) {
14.             int value = i * ((int) Math.random());
15.             Integer intObj = new Integer(value);
16.             numbers.add(intObj);
17.         }
18.         System.out.println(numbers);
19.     }
```

Which line of code marks the earliest point that an object referenced by intObj becomes a candidate for garbage collection?

A. Line 16
B. Line 17
C. Line 18
D. Line 19
E. The object is NOT a candidate for garbage collection.

Answer: D

QUESTION 29
Click the Exhibit button.



Given the fully-qualified class names:

```
com.foo.bar.Dog
com.foo.bar.blatz.Book
com.bar.Car
com.bar.blatz.Sun
```

Which graph represents the correct directory structure for a JAR file from which those classes can be used by the compiler and JVM?

A. Jar A
B. Jar B
C. Jar C
D. Jar D
E. Jar E

Answer: A

QUESTION 30
Given:

```
1. public class GC {
```

```
2.      private Object o;
3.      private void doSomethingElse(Object obj) { o = obj; }
4.      public void doSomething() {
5.          Object o = new Object();
6.          doSomethingElse(o);
7.          o = new Object();
8.          doSomethingElse(null);
9.          o = null;
10.     }
11. }
```

When the doSomething method is called, after which line does the Object created in line 5 become available for garbage collection?

A. Line 5
B. Line 6
C. Line 7
D. Line 8
E. Line 9
F. Line 10

Answer: D

QUESTION 31
Given:

```
public class Spock {
    public static void main(String[] args) {
        Long tail = 2000L;
        Long distance = 1999L;
        Long story = 1000L;
        if ((tail > distance) ^ ((story * 2) == tail))
            System.out.print("1");
        if ((distance + 1 != tail) ^ ((story * 2) == distance))
            System.out.print("2");
    }
}
```

What is the result?

A. 1
B. 2
C. 12
D. Compilation fails.
E. No output is produced.
F. An exception is thrown at runtime.

Answer: E

Exam I

QUESTION 1
Given:

```
1. public class Pass2 {
2.     public void main(String[] args) {
3.         int x = 6;
4.         Pass2 p = new Pass2();
5.         p.doStuff(x);
6.         System.out.print(" main x = " + x);
7.     }
8.
9.     void doStuff(int x) {
10.        System.out.print(" doStuff x = " + x++);
11.    }
12.}
```

And the command-line invocations:

```
javac Pass2.java
java Pass2 5
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. doStuff x = 6 main x = 6
D. doStuff x = 6 main x = 7
E. doStuff x = 7 main x = 6
F. doStuff x = 7 main x = 7

Answer: B

QUESTION 2
Given:

```
1. interface DeclareStuff {
2.     public static final int EASY = 3;
3.
4.     void doStuff(int t);
5. }
6.
7. public class TestDeclare implements DeclareStuff {
8.     public static void main(String[] args) {
9.         int x = 5;
10.        new TestDeclare().doStuff(++x);
11.    }
12.
13.    void doStuff(int s) {
14.        s += EASY + ++s;
15.        System.out.println("s " + s);
16.    }
17.}
```

What is the result?

A. s 14
B. s 16

C. s 10
D. Compilation fails.
E. An exception is thrown at runtime.

Answer: D

QUESTION 3
A class games.cards.Poker is correctly defined in the jar file Poker.jar.
A user wants to execute the main method of Poker on a UNIX system using the command:

```
java games.cards.Poker
```

What allows the user to do this?

A. put Poker.jar in directory /stuff/java, and set the CLASSPATH to include /stuff/java
B. put Poker.jar in directory /stuff/java, and set the CLASSPATH to include /stuff/java/*.jar
C. put Poker.jar in directory /stuff/java, and set the CLASSPATH to include /stuff/java/Poker.jar
D. put Poker.jar in directory /stuff/java/games/cards, and set the CLASSPATH to include /stuff/java
E. put Poker.jar in directory /stuff/java/games/cards, and set the CLASSPATH to include /stuff/java/*.jar
F. put Poker.jar in directory /stuff/java/games/cards, and set the CLASSPATH to include /stuff/java/Poker.jar

Answer: C

QUESTION 4
Given a correctly compiled class whose source code is:

```
1. package com.sun.sjcp;
2.
3. public class Commander {
4.     public static void main(String[] args) {
5.         // more code here
6.     }
7. }
```

Assume that the class file is located in /foo/com/sun/sjcp/, the current directory is /foo/, and that the classpath contains "." (current directory). Which command line correctly runs Commander?

A. java Commander
B. java com.sun.sjcp.Commander
C. java com/sun/sjcp/Commander
D. java -cp com.sun.sjcp Commander
E. java -cp com/sun/sjcp Commander

Answer: B

QUESTION 5
Given:

```
interface DoStuff2 {
    float getRange(int low, int high);
}

interface DoMore {
    float getAvg(int a, int b, int c);
}
```

```
abstract class DoAbstract implements DoStuff2, DoMore {
}

class DoStuff implements DoStuff2 {
    public float getRange(int x, int y) {
        return 3.14f;
    }
}

interface DoAll extends DoMore {
    float getAvg(int a, int b, int c, int d);
}
```

What is the result?

A. The file will compile without error.
B. Compilation fails. Only line 7 contains an error.
C. Compilation fails. Only line 12 contains an error.
D. Compilation fails. Only line 13 contains an error.
E. Compilation fails. Only lines 7 and 12 contain errors.
F. Compilation fails. Only lines 7 and 13 contain errors.
G. Compilation fails. Lines 7, 12, and 13 contain errors.

Answer: A

QUESTION 6
Given:

```
public class Spock {
    public static void main(String[] args) {
        Long tail = 2000L;
        Long distance = 1999L;
        Long story = 1000L;
        if ((tail > distance) ^ ((story * 2) == tail))
            System.out.print("1");
        if ((distance + 1 != tail) ^ ((story * 2) == distance))
            System.out.print("2");
    }
}
```

What is the result?

A. 1
B. 2
C. 12
D. Compilation fails.
E. No output is produced.
F. An exception is thrown at runtime.

Answer: E

QUESTION 7
Given:

```
class Payload {
    private int weight;

    public Payload() {
```

```
    }

    public Payload(int w) {
        weight = w;
    }

    public void setWeight(int w) {
        weight = w;
    }

    public String toString() {
        return Integer.toString(weight);
    }
}

public class TestPayload {
    static void changePayload(Payload p) {
        /* insert code */
    }

    public static void main(String[] args) {
        Payload p = new Payload(200);
        p.setWeight(1024);
        changePayload(p);
        System.out.println("p is " + p);
    }
}
```

Which code fragment, inserted at the end of line 12, produces the output p is 420?

A. p.setWeight(420);
B. p.changePayload(420);
C. p = new Payload(420);
D. Payload.setWeight(420);
E. p = Payload.setWeight(420);

Answer: A

QUESTION 8
Click the Task button.

```
class A {
    String name = "A";

    String getName() {
        return name;
    }

    String greeting() {
        return "class A";
    }
}

class B extends A {
    String name = "B";

    String greeting() {
        return "class B";
    }
}

public class Client {
```

```
    public static void main(String[] args) {
        A a = new A();
        A b = new B();
        System.out.println(a.greeting() + " has name " + a.getName());
        System.out.println(b.greeting() + " has name " + b.getName());
    }
}
```

A.

B.

C.

D.

Answer: A

QUESTION 9
Click the Exhibit button.
What is the result?

```
1. public class SimpleCalc {
2.    public int value;
3.    public void calculate() { value += 7; }
4. }
```

And:

```
1. public class MultiCalc extends
SimpleCalc{
2.    public void calculate() { value -= 3; }
3.    public void calculate(int multiplier) {
4.       calculate();
5.       super.calculate();
6.       value *= multiplier;
7.    }
8.    public static void main(String[] args)
{
9.       MultiCalc calculator = new
MultiCalc();
10.      calculator.calculate(2);
11.      System.out.println("Value is: " +
calculator.value);
12.   }
13. }
```

A. Value is: 8
B. Compilation fails.
C. Value is: 12
D. Value is: -12
E. The code runs with no output.
F. An exception is thrown at runtime.

Answer: A

QUESTION 10
Given:

```
class Line {
    public class Point {
        public int x, y;
    }

    public Point getPoint() {
        return new Point();
    }
}

class Triangle {
    public Triangle() {
        // insert code here
    }
}
```

Which code, inserted at line 16, correctly retrieves a local instance of a Point object?

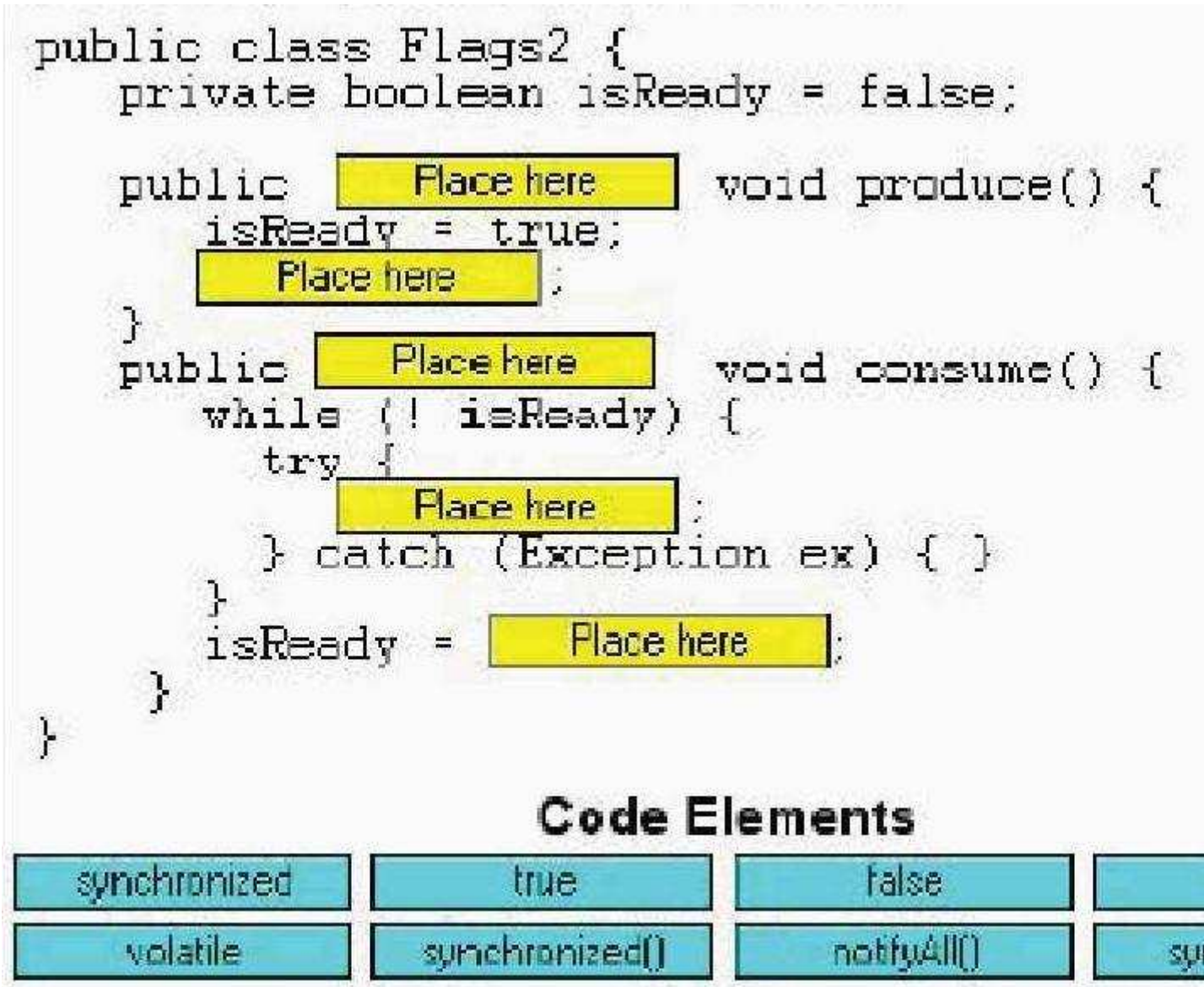
A. `Point p = Line.getPoint();`
B. `Line.Point p = Line.getPoint();`
C. `Point p = (new Line()).getPoint();`
D. `Line.Point p = (new Line()).getPoint();`

Answer: D

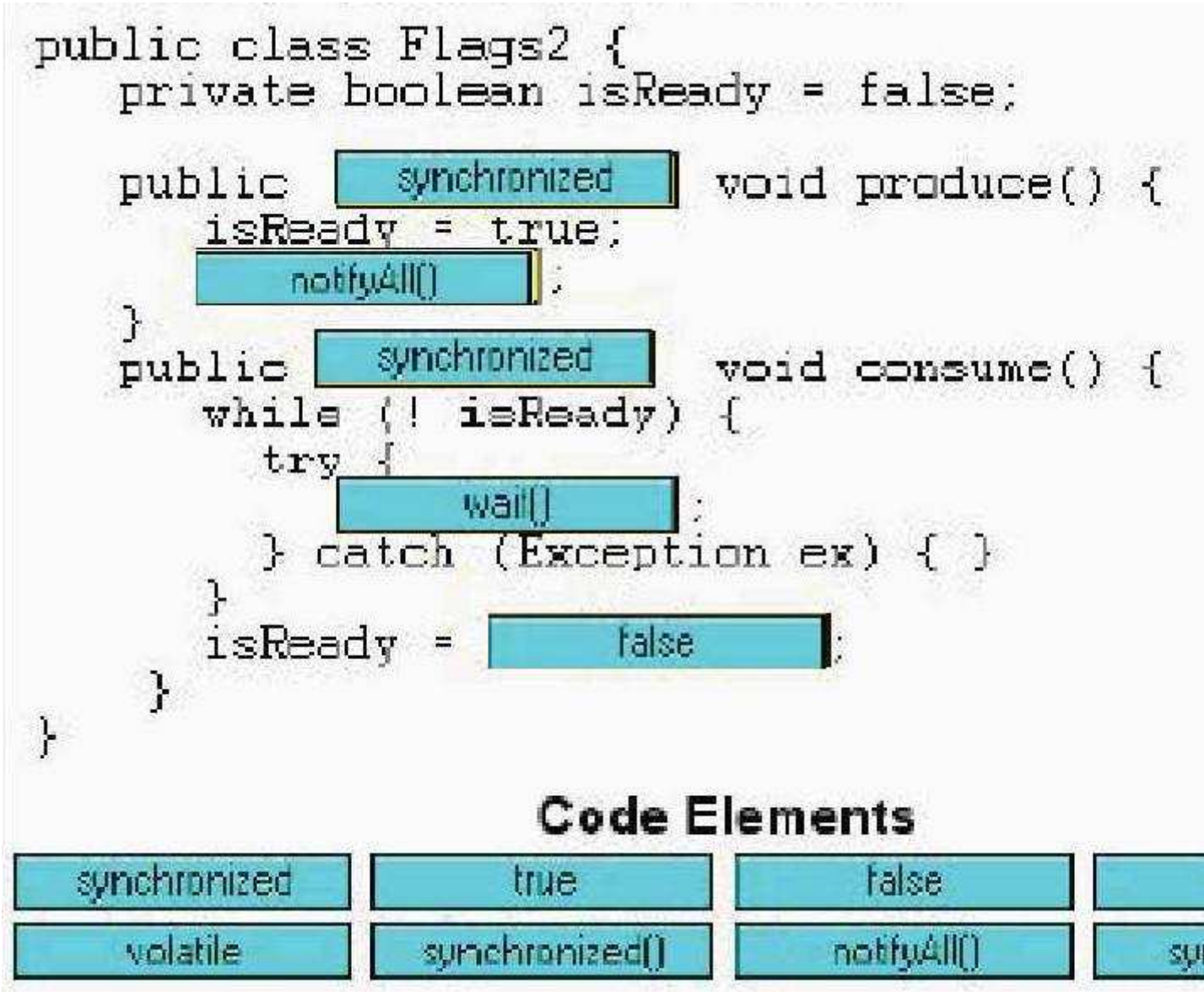
Exam J

QUESTION 1

Place the code elements in position so that the Flag
compile and make appropriate use of the wait/notify
Note: You may reuse code elements.



Answer:



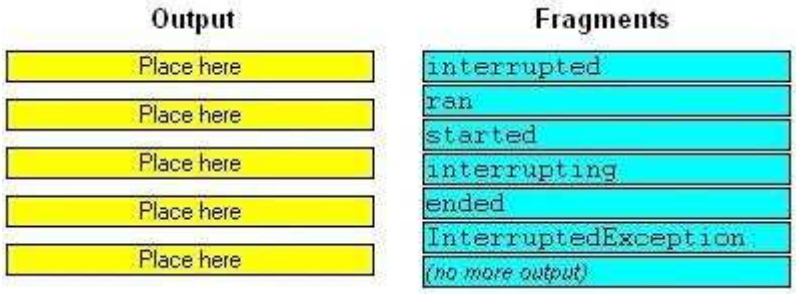
QUESTION 2

Given:

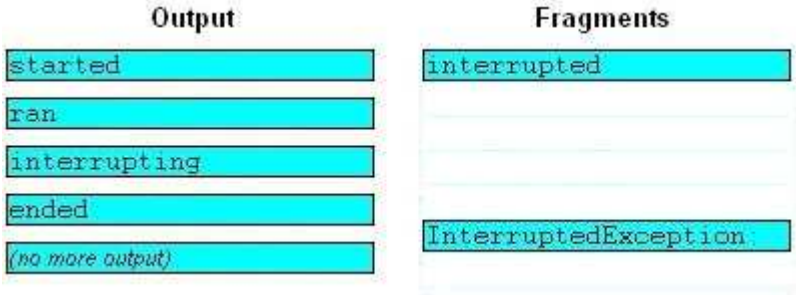
```
10.  Runnable r = new Runnable() {
11.    public void run() {
12.      try {
13.        Thread.sleep(1000);
14.      } catch (InterruptedException e) {
15.        System.out.println("interrupted");
16.      }
17.      System.out.println("ran");
18.    }
19.  };
20.  Thread t = new Thread(r);
21.  t.start();
22.  System.out.println("started");
23.  t.sleep(2000);
24.  System.out.println("interrupting");
25.  t.interrupt();
26.  System.out.println("ended");
```

Assume that sleep(n) executes in exactly n milliseconds, and all other code executes in an insignificant amount of time.

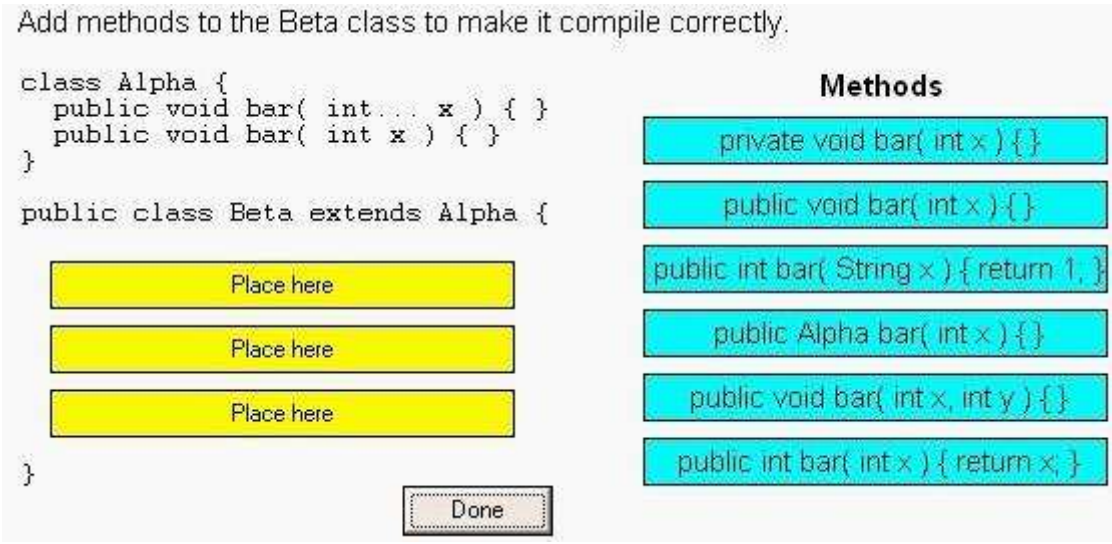
Place the fragments in the output area to show the result of running this code.



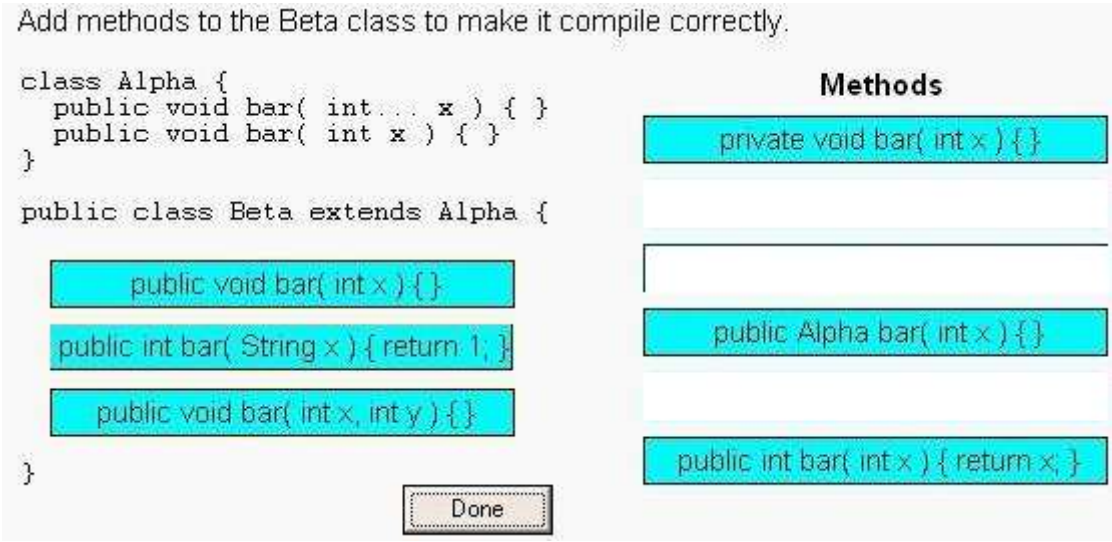
Answer:



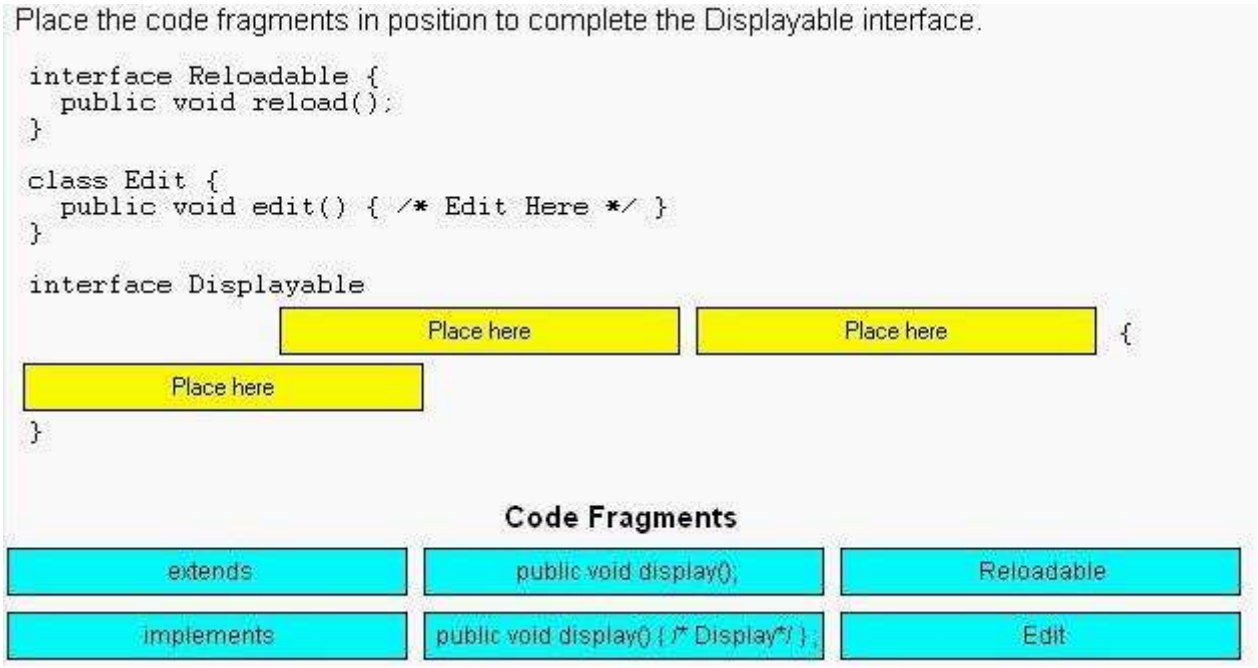
QUESTION 3



Answer:



QUESTION 4



Answer:

Place the code fragments in position to complete the Displayable interface.

```
interface Reloadable {
  public void reload();
}

class Edit {
  public void edit() { /* Edit Here */ }
}

interface Displayable
```

extends | Reloadable | {

public void display();

```
}
```

Code Fragments

implements	public void display() { /* Display*/ } ;	Edit

QUESTION 5

Drag and Drop

Insert six modifiers into the code such that it m

1. It must be possible to create instances of Alp
   they are defined.
2. When an object of type Alpha (or any potenti
   the instance variable alpha may never be cha
3. The value of the instance variable alpha mus

Code

```
package alpha;
[Place here] class Alpha {
    [Place here] String alpha;
    [Place here] Alpha() { this("A"); }
    [Place here] Alpha(String a) { alpha
}

package beta;
[Place here] class Beta extends alpha.
    [Place here] Beta(String a) { super(
}
```

Answer:

Drag and Drop

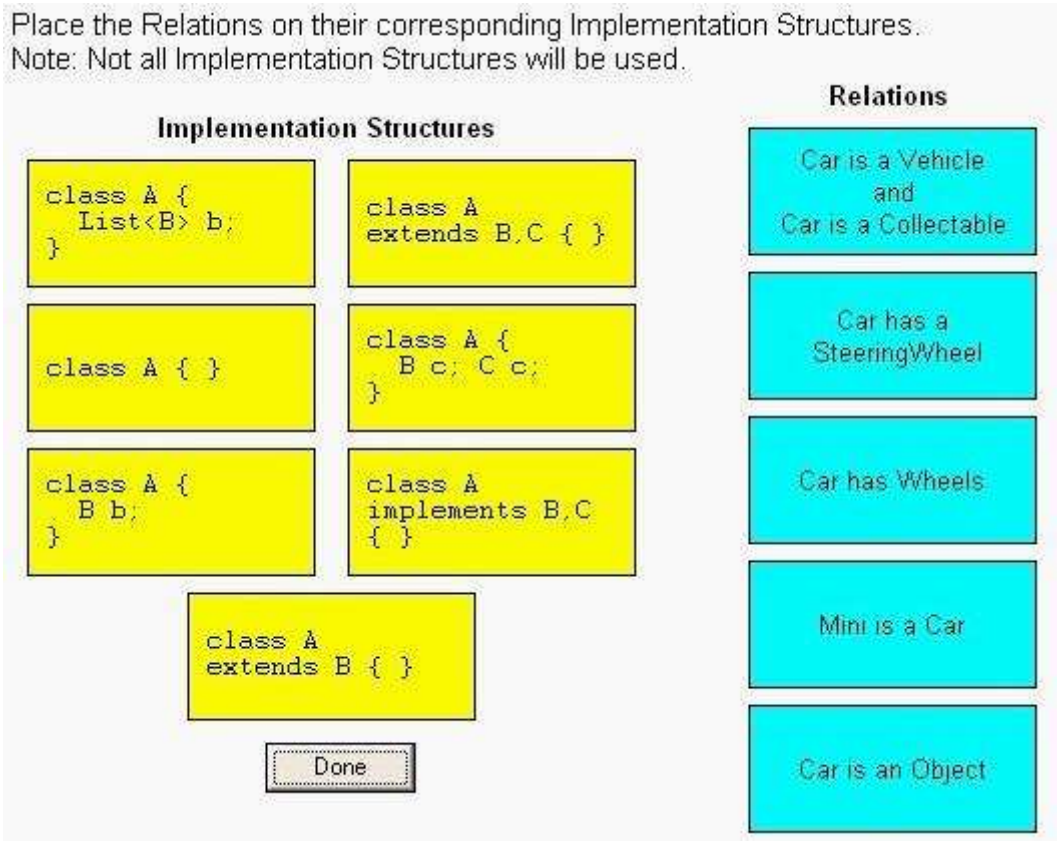
Insert six modifiers into the code such that it m

1. It must be possible to create instances of Alp
   they are defined.
2. When an object of type Alpha (or any potenti
   the instance variable alpha may never be cha
3. The value of the instance variable alpha mus

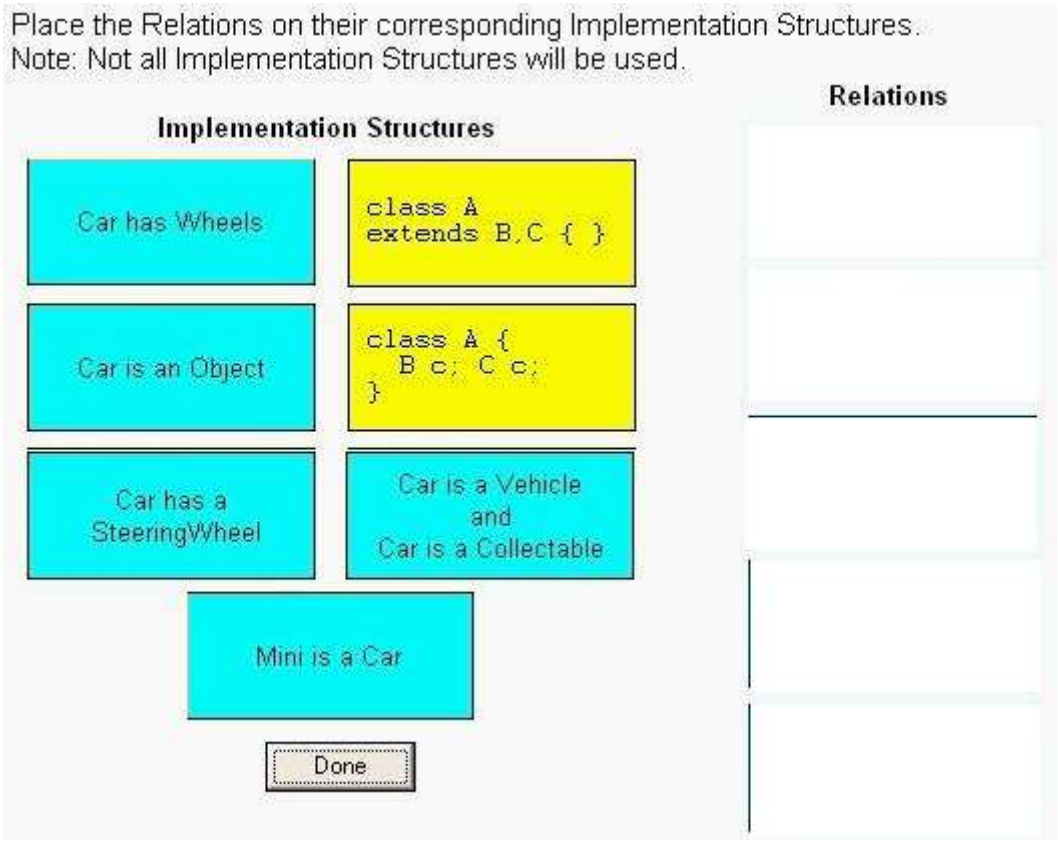
Code

```
package alpha;
[ public ] class Alpha {
    [ private ] String alpha;
    [ public ] Alpha() { this("A"); }
    [ protected ] Alpha(String a) { alpha
}

package beta;
[ public ] class Beta extends alpha.
    [ public ] Beta(String a) { super(
}
```

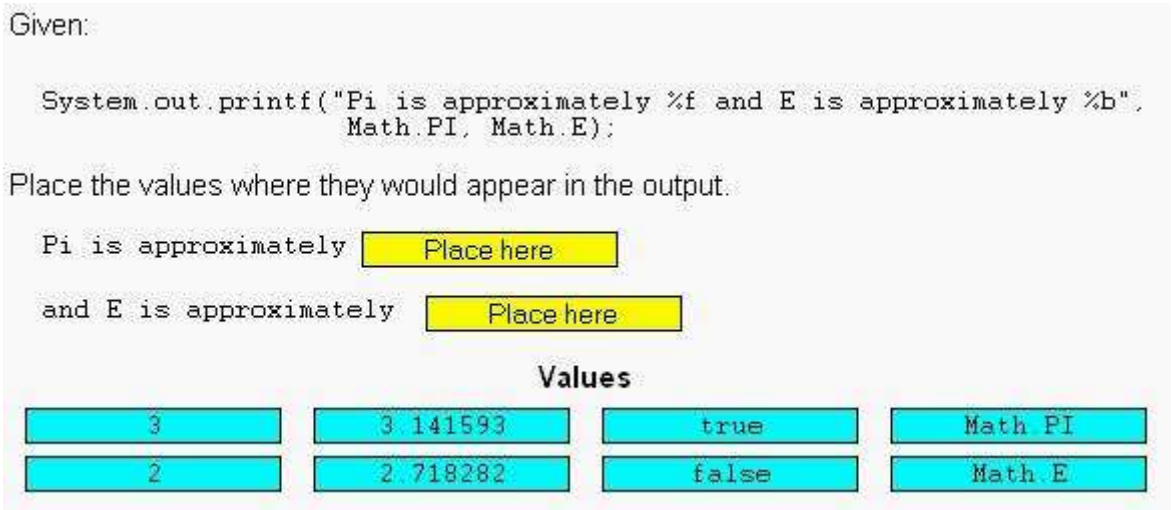
QUESTION 6



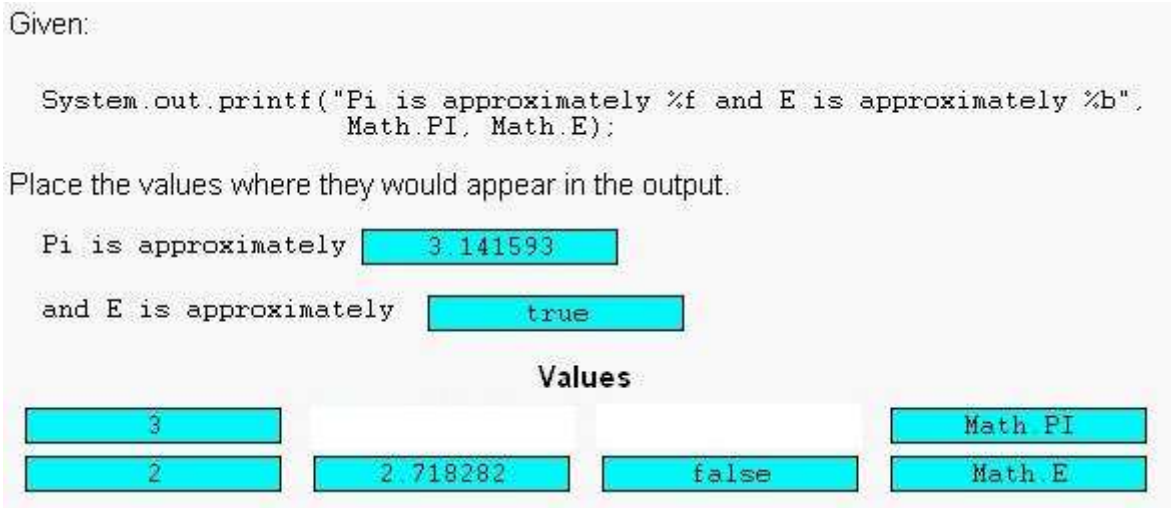
Answer:



QUESTION 7



Answer:



QUESTION 8

Place the correct description of the compiler output on the code fragments to be inserted at lines 4 and 5. The same compiler output may be used more than once.

```
1. import java.util.*;
2. public class X {
3.   public static void main(String[] args) {
4.     // insert code here
5.     // insert code here
6.   }
7.   public static void foo(List<Object> list) {
8.   } }
```

Code

```
ArrayList<String> x1 = new ArrayList<String>();
foo(x1);
```

```
ArrayList<Object> x2 = new ArrayList<String>();
foo(x2);
```

```
ArrayList<Object> x3 = new ArrayList<Object>();
foo(x3);
```

```
ArrayList x4 = new ArrayList();
foo(x4);
```

Compiler Output

- Compilation succeeds
- Compilation fails due to an error in the first statement
- Compilation of the first statement succeeds, but compilation fails due to an error in the second statement

Answer:

Place the correct description of the compiler output on the code fragments to be inserted at lines 4 and 5. The same compiler output may be used more than once.

```
1. import java.util.*;
2. public class X {
3.   public static void main(String[] args) {
4.     // insert code here
5.     // insert code here
6.   }
7.   public static void foo(List<Object> list) {
8.   } }
```

Code

- Compilation of the first statement succeeds, but compilation fails due to an error in the second statement
- Compilation fails due to an error in the first statement
- Compilation succeeds
- Compilation succeeds

Compiler Output

- Compilation succeeds
- Compilation fails due to an error in the first statement
- Compilation of the first statement succeeds, but compilation fails due to an error in the second statement

QUESTION 9

Place code into the class so that it compiles and generates the output `answer=42`. Note: Code options may be used more than once.

Class

```
public class [Place here] {
  private [Place here] object;
  public [Place here] ([Place here] object) {
    this.object = object;
  }
  public [Place here] getObject() {
    return object;
  }

  public static void main(String[] args) {
    Gen<String> str = new Gen<String>("answer");
    Gen<Integer> intg = new Gen<Integer>(42);
    System.out.println(str.getObject() + "=" +
        intg.getObject());
  }
}
```

Code Options

- Gen<T>
- Gen<?>
- Gen
- ?
- T

Answer:

Place code into the class so that it compiles and generates the output `answer=42`. Note: Code options may be used more than once.

Class

```
public class [Gen<T>] {
  private [T] object;
  public [Gen] ([T] object) {
    this.object = object;
  }
  public [T] getObject() {
    return object;
  }

  public static void main(String[] args) {
    Gen<String> str = new Gen<String>("answer");
    Gen<Integer> intg = new Gen<Integer>(42);
    System.out.println(str.getObject() + "=" +
        intg.getObject());
  }
}
```

Code Options

- Gen<T>
- Gen<?>
- Gen
- ?
- T

QUESTION 10

Given the class definitions:

```
class Animal { }
class Dog extends Animal { }
```

and the code:

```
public void go() {
  ArrayList<Dog> aList = new ArrayList<Dog>();
  takeList(aList);
}
// insert definition of the takeList() method here
```

Place the correct Compilation Result on each takeList() method definition to indicate whether or not the go() method would compile given that definition.

takeList() Method Definition

- `public void takeList(ArrayList list) { }`
- `public void takeList(ArrayList<Animal> list) { }`
- `public void takeList(ArrayList<? extends Animal> list) { }`
- `public void takeList(ArrayList<?> list) { }`
- `public void takeList(ArrayList<Object> list) { }`

Compilation Result

- Compilation succeeds.
- Compilation fails.

Answer:

Given the class definitions:

```
class Animal { }
class Dog extends Animal { }
```

and the code:

```
public void go() {
  ArrayList<Dog> aList = new ArrayList<Dog>();
  takeList(aList);
}
// insert definition of the takeList() method here
```

Place the correct Compilation Result on each takeList() method definition to indicate whether or not the go() method would compile given that definition.

takeList() Method Definition

- Compilation succeeds.
- Compilation fails.
- Compilation succeeds.
- Compilation succeeds.
- Compilation fails.

Compilation Result

- Compilation succeeds.
- Compilation fails.

QUESTION 11

Place the code in the appropriate places such that this program will always output [

```
import java.util.*;

public class MyInt Place here Place here {
    public static void main(String[] args) {
      ArrayList<MyInt> list = new ArrayList<MyInt>();
      list.add(new MyInt(2));
      list.add(new MyInt(1));
      Collections.sort(list);
      System.out.println(list);
    }
    private int i;
    public MyInt(int i) { this.i = i; }
    public String toString() { return Integer.toString(i); }

    Place here int Place here {
      MyInt i2 = (MyInt)o;

      return Place here ;
    }
}
```

Code

implements	extends	Sortable	Object	Compe
protected	public	i - i2.i	i	i2.i
compare(MyInt o, MyInt i2)		compare(Object o, Object i2)		
sort(Object o)		sort(MyInt o)		
compareTo(MyInt o)		compareTo(Object o)		

Answer:

Place the code in the appropriate places such that this program will always output [

```
import java.util.*;

public class MyInt [implements] [Comparable] {
    public static void main(String[] args) {
      ArrayList<MyInt> list = new ArrayList<MyInt>();
      list.add(new MyInt(2));
      list.add(new MyInt(1));
      Collections.sort(list);
      System.out.println(list);
    }
    private int i;
    public MyInt(int i) { this.i = i; }
    public String toString() { return Integer.toString(i); }

    [public] int [compareTo(Object o)] {
      MyInt i2 = (MyInt)o;

      return [i - i2.i] ;
    }
}
```

Code

[extends] [Sortable] [Object]

[protected] [i] [i2.i]

[compare(MyInt o, MyInt i2)] [compare(Object o, Object i2)]

[sort(Object o)] [sort(MyInt o)]

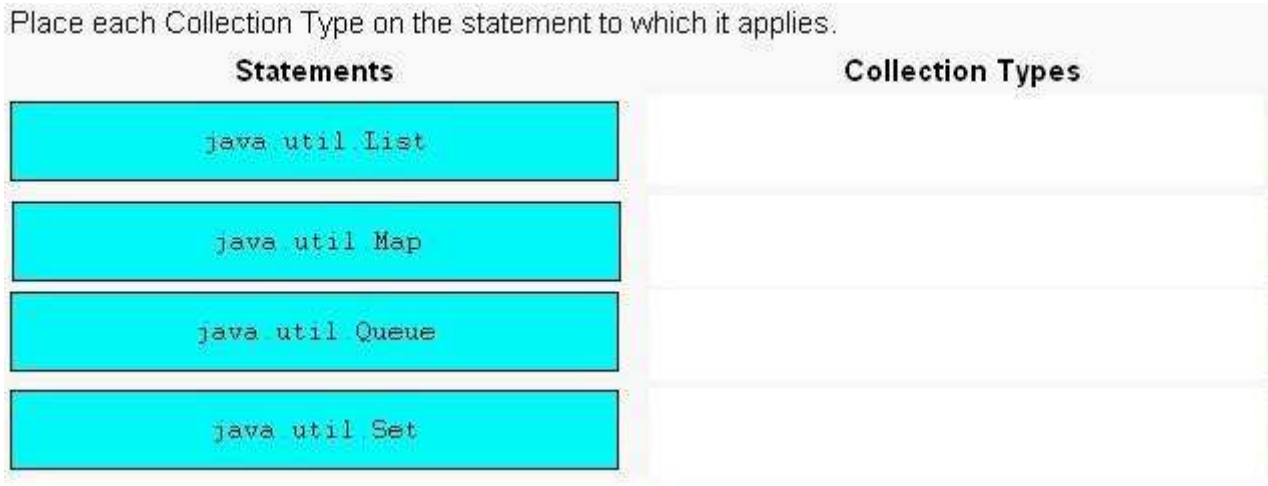
[compareTo(MyInt o)]

QUESTION 12

Place each Collection Type on the statement to which it applies.

Statements	Collection Types
allows access to elements by their integer index	java.util.Map
defines the method: V get(Object key)	java.util.Set
is designed for holding elements prior to processing	java.util.List
contains no pair of elements e1 and e2, such that e1.equals(e2)	java.util.Queue

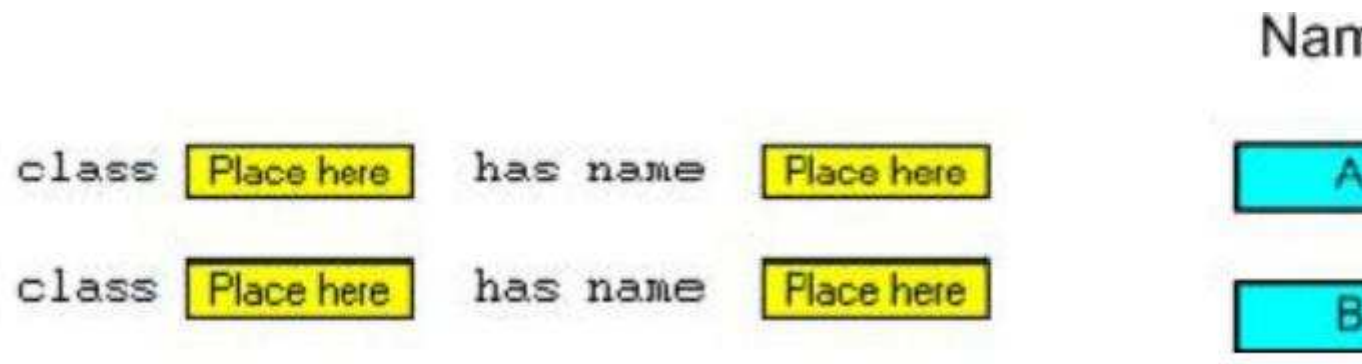
Answer:



QUESTION 13

```
class A {
    String name = "A";

    String getName() {
        return name;
    }

    String greeting() {
        return "class A";
    }
}

class B extends A {
    String name = "B";

    String greeting() {
        return "class B";
    }
}

public class Client {
    public static void main(String[] args) {
        A a = new A();
        A b = new B();
        System.out.println(a.greeting() + " has name " + a.getName());
        System.out.println(b.greeting() + " has name " + b.getName());
    }
}
```

Click the Task button.



Answer:

QUESTION 14

Replace two of the Modifiers that appear in the `Single` class to make the code compile.
Note: Three modifiers will not be used and four modifiers in the code will remain unchanged.

Code

```
public class Single {
   private  static  Single instance;
   public   static  Single getInstance() {
      if (instance == null) instance = create();
      return instance;
    }
   private  Single() { }
   protected Single create() { return new Single(); }
}
class SingleSub extends Single {
}
```

Modifiers

final
protected
private
abstract
static

Done

Answer:

Replace two of the Modifiers that appear in the `Single` class to make the code compile.
Note: Three modifiers will not be used and four modifiers in the code will remain unchanged.

Code

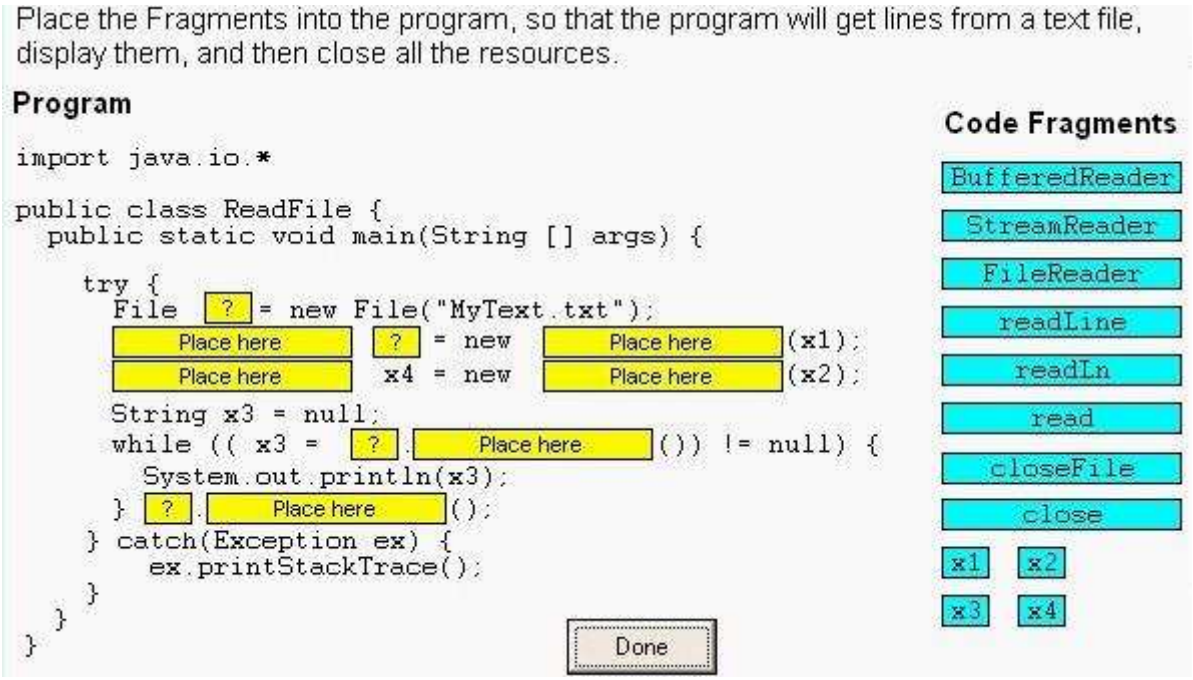
```
public class Single {
   private  static  Single instance;
   public   static  Single getInstance() {
      if (instance == null) instance = create();
      return instance;
    }
   protected Single() { }
   static   Single create() { return new Single(); }
}
class SingleSub extends Single {
}
```

Modifiers

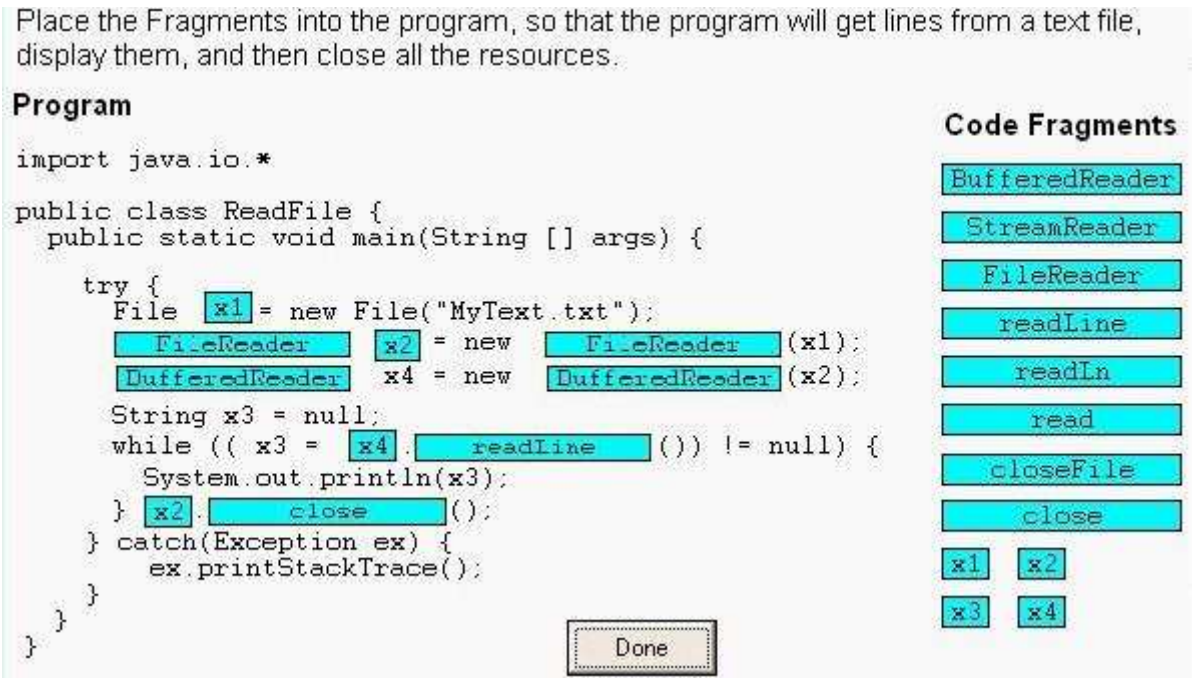
final
private
abstract

Done

QUESTION 15



Answer:



QUESTION 16

Given:

```
public class Doubler {
  public static int doubleMe( Holder h) {
    return h.getAmount() * 2;
  }
}
```

and:

```
public class Holder {
  int amount = 10;
  public void doubleAmount(){ amount = Doubler.doubleMe( this );}
  public int getAmount(){ return amount;}
  //more code here
}
```

Place the code fragments in position to reduce the coupling between Doubler and Holder.

```
public class Doubler {
  public static int doubleMe( [Place here]   h) {
    return [Place here]  * 2;
  }
}

public class Holder {
  int amount = 10;
  public void doubleAmount(){ amount = Doubler.doubleMe( [Place here] );}
  public int getAmount(){ return amount;}
  //more code here
}
```

Code Fragments

void	Holder	int	Doubler
h.getAmount()	h	this	amount

Done

Answer:

Given:

```
public class Doubler {
  public static int doubleMe( Holder h) {
    return h.getAmount() * 2;
  }
}
```

and:

```
public class Holder {
  int amount = 10;
  public void doubleAmount(){ amount = Doubler.doubleMe( this );}
  public int getAmount(){ return amount;}
  //more code here
}
```

Place the code fragments in position to reduce the coupling between Doubler and Holder.

```
public class Doubler {
  public static int doubleMe( [int]   h) {
    return [h]  * 2;
  }
}

public class Holder {
  int amount = 10;
  public void doubleAmount(){ amount = Doubler.doubleMe( [amount] );}
  public int getAmount(){ return amount;}
  //more code here
}
```

Code Fragments

void	Holder		Doubler
h.getAmount()		this	

Done

QUESTION 17

Place the code elements into the class so that the code compiles and prints "Run. Run. dolt." in exactly that order. Note that there may be more than one correct solution.

```
public class TesTwo extends Thread {
 public static void main (String[] a) throws Exception {
    TesTwo t = new TesTwo();
    t.start();
    [Place here]
    [Place here]
  } [Place here]
  public void run() {
    System.out.print("Run. ");
  }
  public void doIt() {
    System.out.print("doIt. ");
  }
}
```

Code Elements

`t.start();` `t.join();` `t.pause(10);` `run();`
`t.run();` `t.doIt();` `doIt();`

Answer:

Place the code elements into the class so that the code compiles and prints "Run. Run. dolt." in exactly that order. Note that there may be more than one correct solution.

```
public class TesTwo extends Thread {
 public static void main (String[] a) throws Exception {
    TesTwo t = new TesTwo();
    t.start();
    t.run();
    t.join();
  } t.doIt();
  public void run() {
    System.out.print("Run. ");
  }
  public void doIt() {
    System.out.print("doIt. ");
  }
}
```

Code Elements

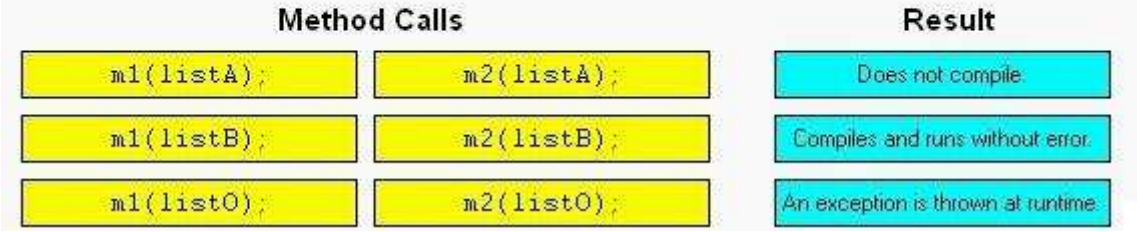
`t.start();` `t.pause(10);` `run();`
`doIt();`

QUESTION 18

Given:

```
1. import java.util.*;
2. class A { }
3. class B extends A { }
4. public class Test {
5.   public static void main(String[] args) {
6.     List<A> listA = new LinkedList<A>();
7.     List<B> listB = new LinkedList<B>();
8.     List<Object> listO = new LinkedList<Object>();
9.     // insert code here
10.  }
11.  public static void m1(List<? extends A> list) { }
12.  public static void m2(List<A> list) { }
13. }
```

Place a result onto each method call to indicate what would happen if the method call were inserted at line 9. Note: Results can be used more than once.

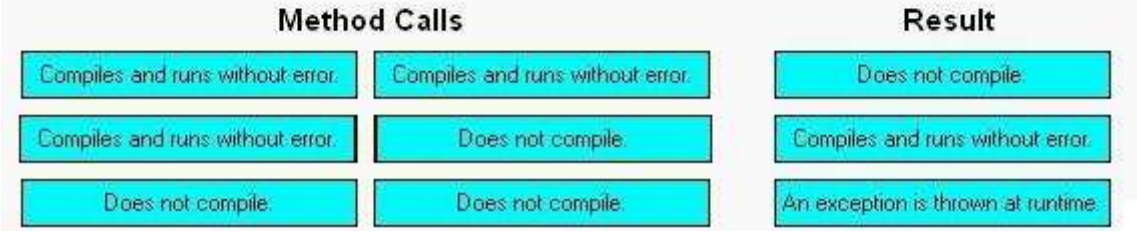


Answer:

Given:

```
1. import java.util.*;
2. class A { }
3. class B extends A { }
4. public class Test {
5.   public static void main(String[] args) {
6.     List<A> listA = new LinkedList<A>();
7.     List<B> listB = new LinkedList<B>();
8.     List<Object> listO = new LinkedList<Object>();
9.     // insert code here
10.  }
11.  public static void m1(List<? extends A> list) { }
12.  public static void m2(List<A> list) { }
13. }
```

Place a result onto each method call to indicate what would happen if the method call were inserted at line 9. Note: Results can be used more than once.



QUESTION 19

Given:
```
NumberNames nn = new NumberNames();
nn.put("one", 1);
System.out.println(nn.getNames());
```

Place the code into position to create a class that maps from Strings to integer values. The result of execution must be [one]. Some options may be used more than once.

```
public class NumberNames {
  private HashMap< Place here , Place here > map =
      new HashMap< Place here , Place here Place here ;
  public void put(String name, int value) {
    map.put( Place here , Place here );
  }
  public Place here getNames() {
    return map.keySet();
  }
}
```

Code

Set<int>	Set<Integer>	HashSet
Set<Integer,String>	Set<int, String>	Set<String,Integer>
Set<String, int>	Set<String>	NumberNames
String	Integer	int	>
>()	name	value	map

Answer:

Given:
```
NumberNames nn = new NumberNames();
nn.put("one", 1);
System.out.println(nn.getNames());
```

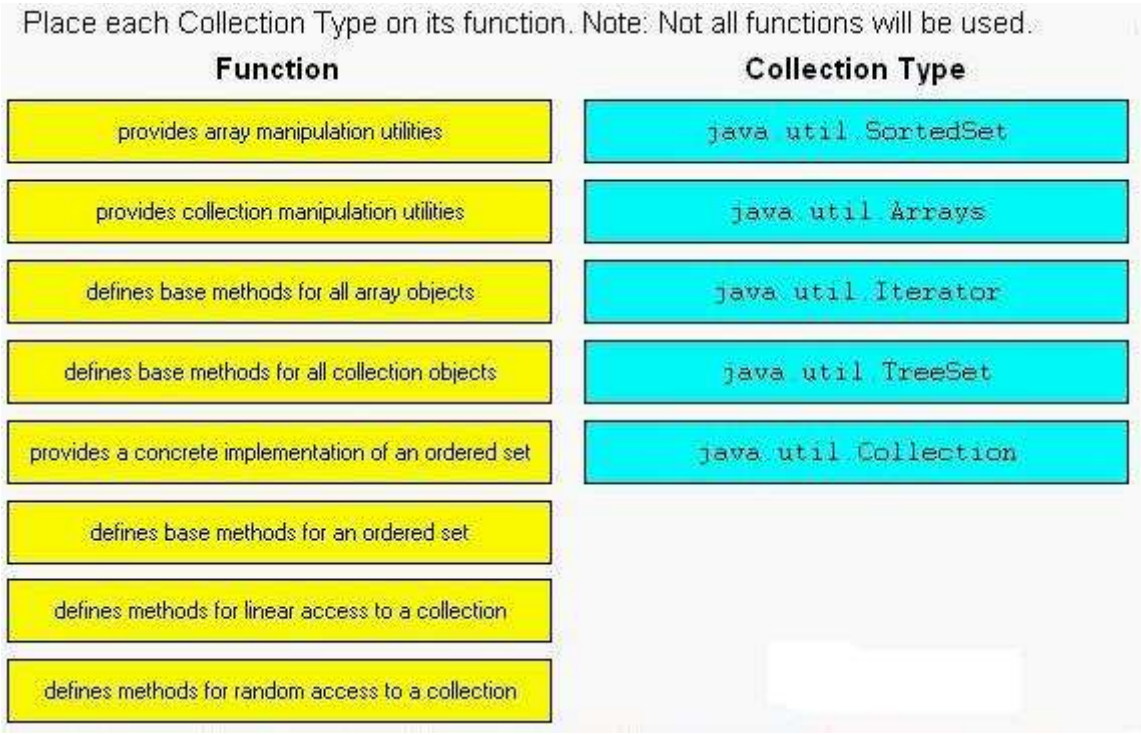
Place the code into position to create a class that maps from Strings to integer values. The result of execution must be [one]. Some options may be used more than once.

```
public class NumberNames {
  private HashMap< String , Integer > map =
      new HashMap< String , Integer >() ;
  public void put(String name, int value) {
    map.put( name , value );
  }
  public Set<String> getNames() {
    return map.keySet();
  }
}
```

Code

Set<int>	Set<Integer>	HashSet
Set<Integer,String>	Set<int, String>	Set<String,Integer>
Set<String, int>	Set<String>	NumberNames
String	Integer	int	>
>()	name	value	map

QUESTION 20



Answer:

QUESTION 21

Chain these constructors to create objects to read from a file named "in" and to write to a file named "out."

```
reader = [Place here] [Place here] "in" ));
writer = [Place here] [Place here] [Place here] "out" )));
```

Constructors

new FileReader(	new PrintReader(	new BufferedReader(
new BufferedWriter(	new FileWriter(	new PrintWriter(

Answer:

Chain these constructors to create objects to read from a file named "in" and to write to a file named "out."

```
reader = [new BufferedReader(] [new FileReader(] "in" ));
writer = [new PrintWriter(] [new BufferedWriter(] [new FileWriter(] "out" )));
```

Constructors

	new PrintReader(	

QUESTION 22

Place the lines in the correct order to complete the enum.

```
enum Element {
```

1st

2nd

3rd

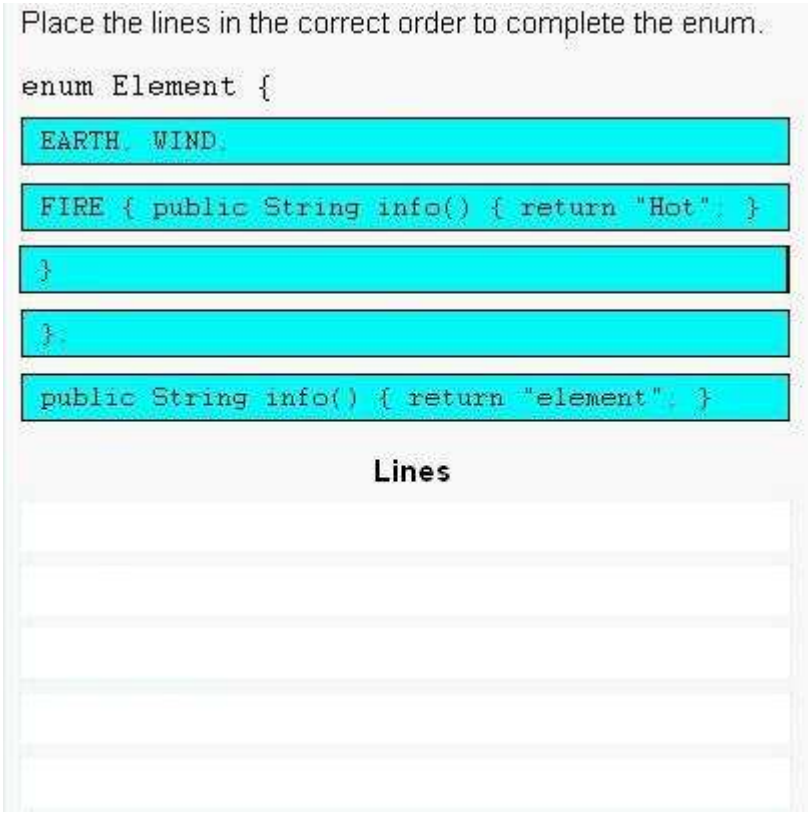
4th

5th

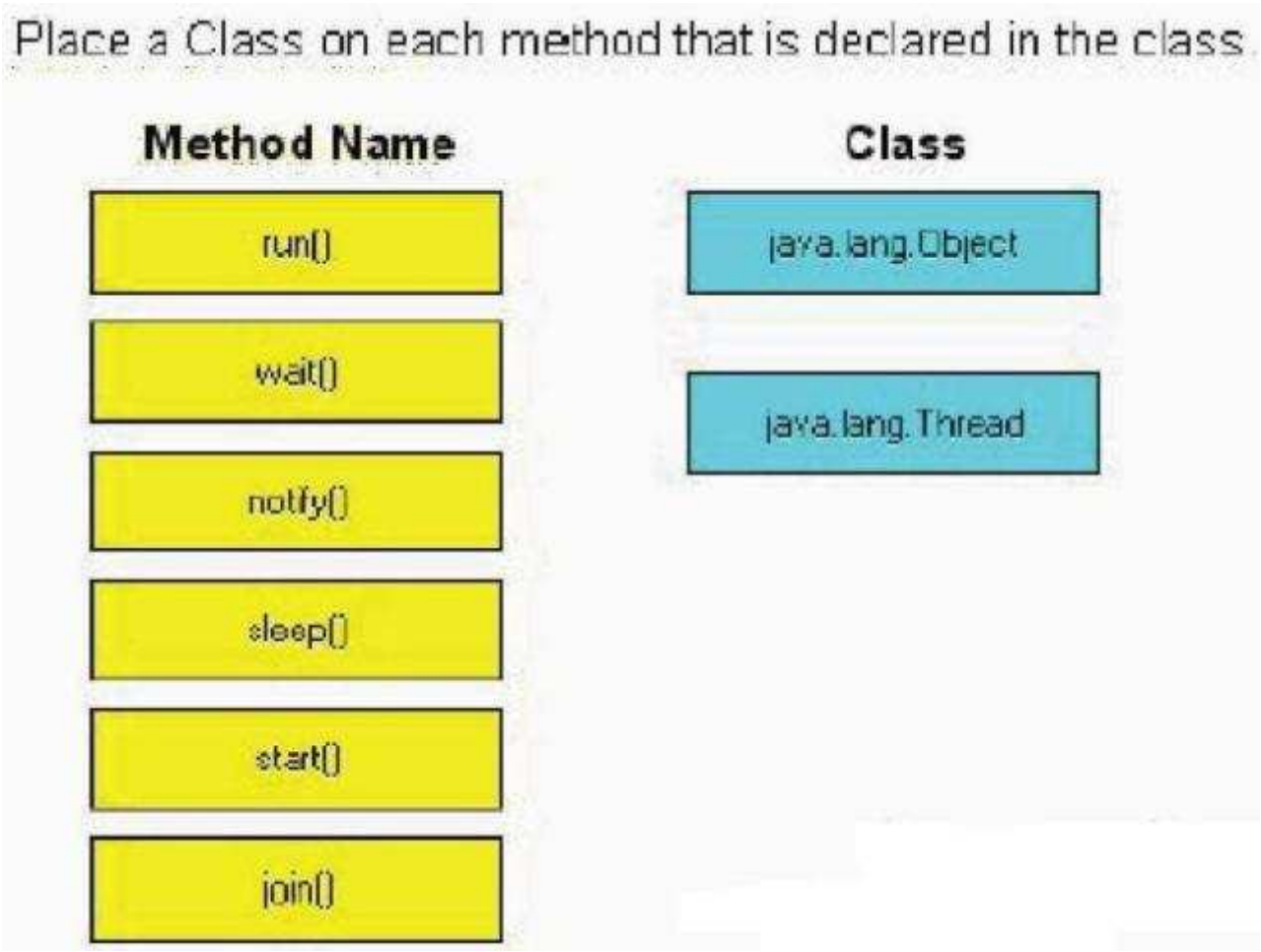
Lines

```
public String info() { return "element"; }
};
FIRE { public String info() { return "Hot"; }
EARTH, WIND,
}
```

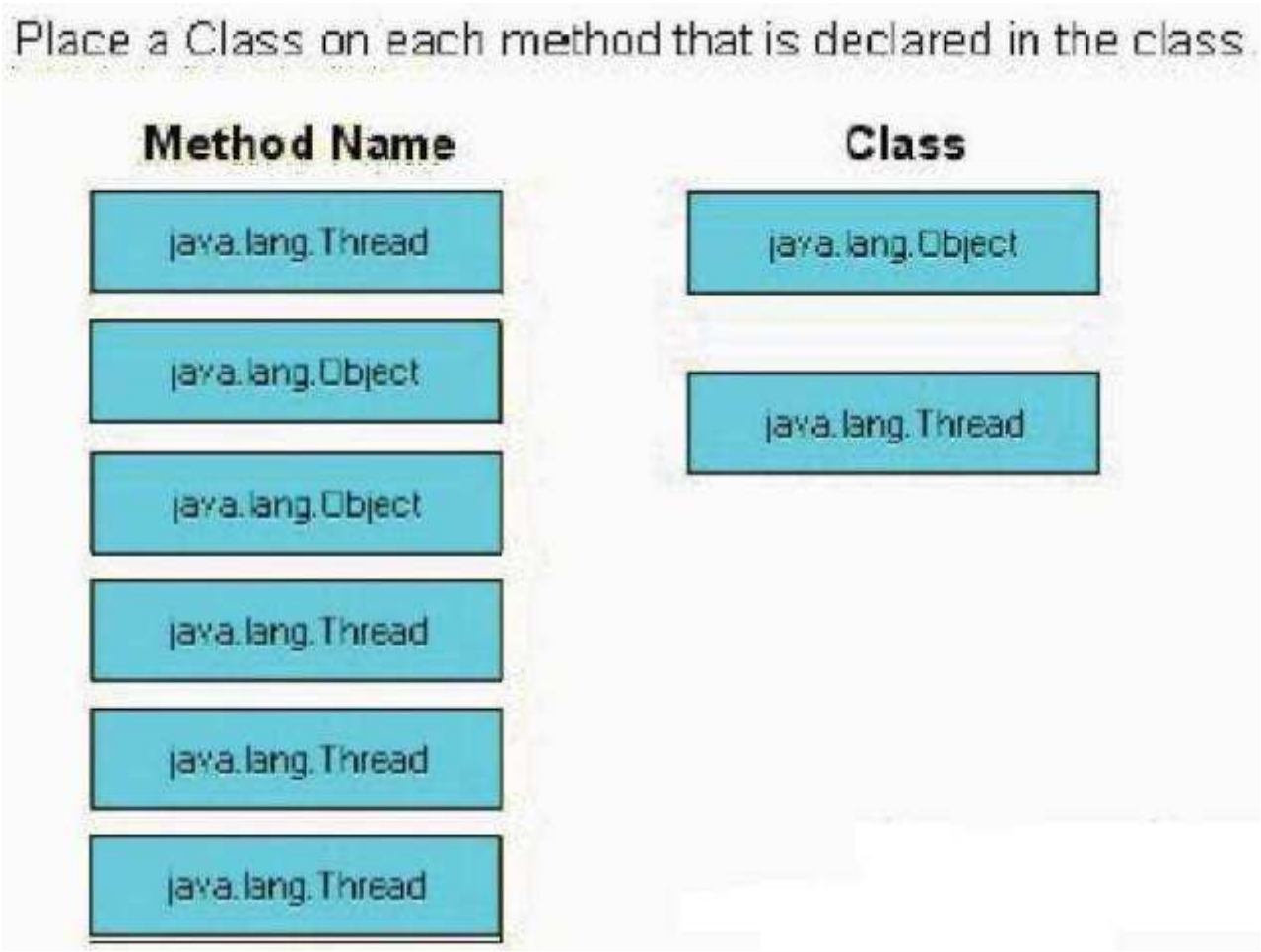
Answer:



QUESTION 23


Place a Class on each method that is declared in the class
Method Name
Class
run()
wait()
notify()
sleep()
start()
join()
java.lang.Object
java.lang.Thread

Answer:


Place a Class on each method that is declared in the class
Method Name
Class
java.lang.Thread
java.lang.Object
java.lang.Object
java.lang.Thread
java.lang.Thread
java.lang.Thread
java.lang.Object
java.lang.Thread

QUESTION 24

The doesFileExist method takes an array of directory names representing a path from the root filesystem and a file name. The method returns true if the file exists, false if it does not.

Place the code fragments in position to complete this method.

```
public static boolean doesFileExist(String[] directories, String filename) {
    Place here
    for ( String dir : directories ) {
        Place here
    }
    Place here

    Place here
}
```

Code Fragments

path = path.getSubdirectory(dir);	return ! file.isNew();	return (file != null);
String path = "";	path = path.getFile(filename);	File path = new File("");
return file.exists();	return path.isFile();	File file = new File(path, filename);
path = new File(path, dir);	File path = new File(File.separator);	path = path + File.separator + dir;

Answer:

The doesFileExist method takes an array of directory names representing a path from the root filesystem and a file name. The method returns true if the file exists, false if it does not.

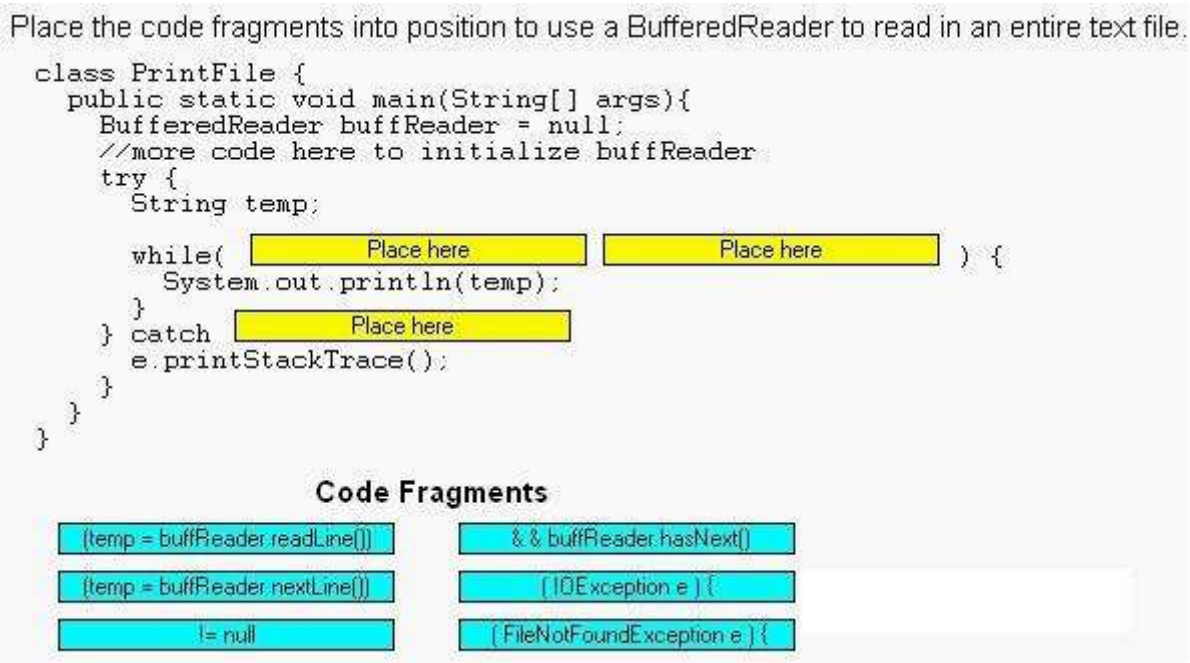
Place the code fragments in position to complete this method.

```
public static boolean doesFileExist(String[] directories, String filename) {
    String path = "";
    for ( String dir : directories ) {
        path = path + File.separator + dir;
    }
    File file = new File(path, filename);

    return file.exists();
}
```

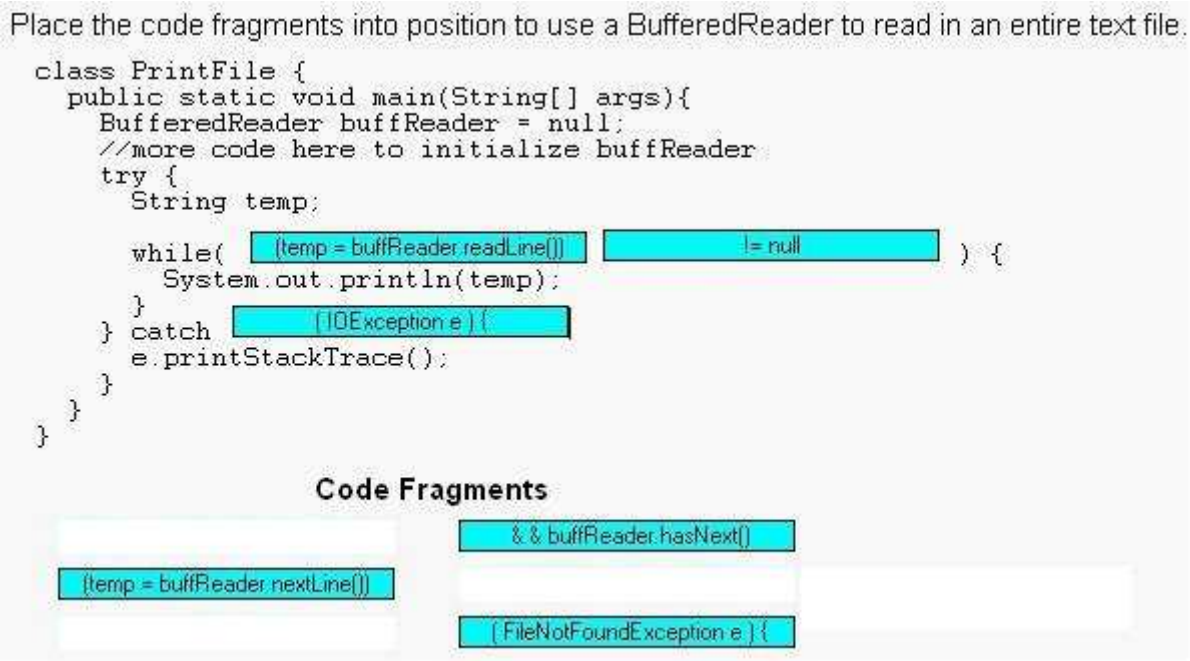
Code Fragments

path = path.getSubdirectory(dir);	return ! file.isNew();	return (file != null);
	path = path.getFile(filename);	File path = new File("");
	return path.isFile();	
path = new File(path, dir);	File path = new File(File.separator);	

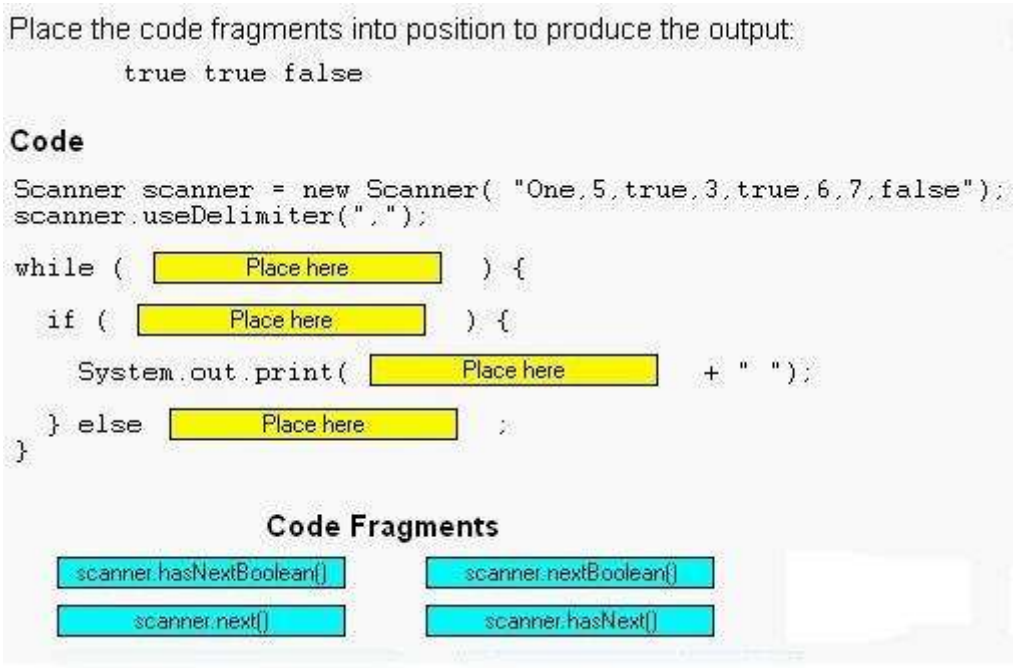
QUESTION 25



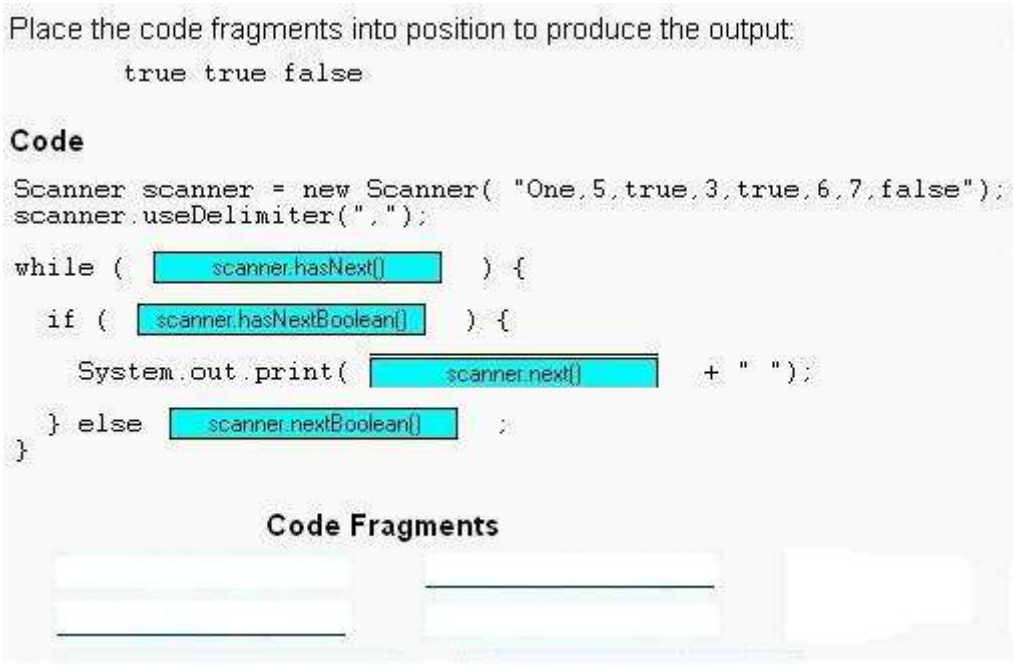
Answer:



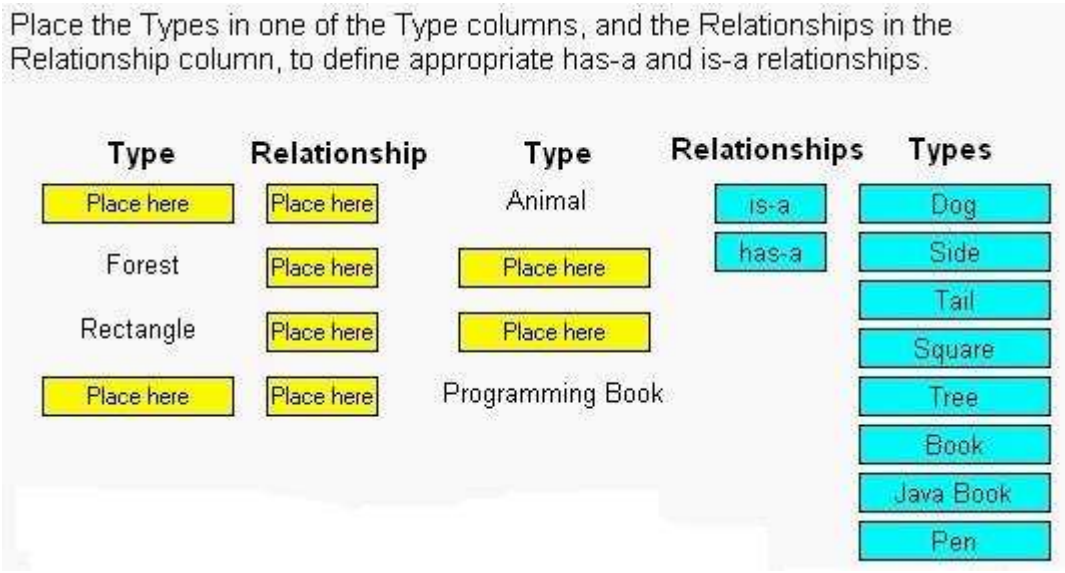
QUESTION 26



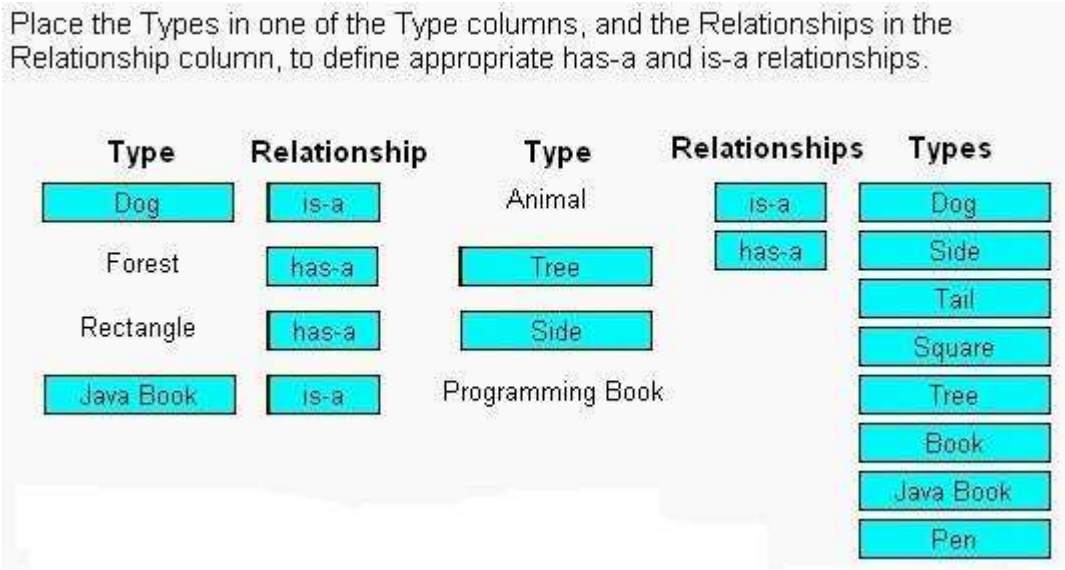
Answer:



QUESTION 27



Answer:



QUESTION 28

Given:

```
1. import java.util.*;
2. public class TestGenericConversion {
3.   public static void main(String[] args) {
4.     List list = new LinkedList();
5.     list.add("one");
6.     list.add("two");
7.     System.out.print(((String)list.get(0)).length());
8.   }
9. }
```

Refactor this class to use generics without changing the code's behavior.

```
1. import java.util.*;
2. public class TestGenericConversion {
3.   public static void main(String[] args) {
4.     Place here
5.     list.add("one");
6.     list.add("two");
7.     Place here
8.   }
9. }
```

Code

List list = new LinkedList();	System.out.print(list.get(0).length());
List<String> list = new LinkedList<String>();	System.out.print(list.get<String>(0).length());
List<String> list = new LinkedList();	System.out.print(<String>list.get(0).length());
List list = new LinkedList<String>();	System.out.print(((List<String>)list.get(0)).length());

Answer:

Given:

```
1. import java.util.*;
2. public class TestGenericConversion {
3.   public static void main(String[] args) {
4.     List list = new LinkedList();
5.     list.add("one");
6.     list.add("two");
7.     System.out.print(((String)list.get(0)).length());
8.   }
9. }
```

Refactor this class to use generics without changing the code's behavior.

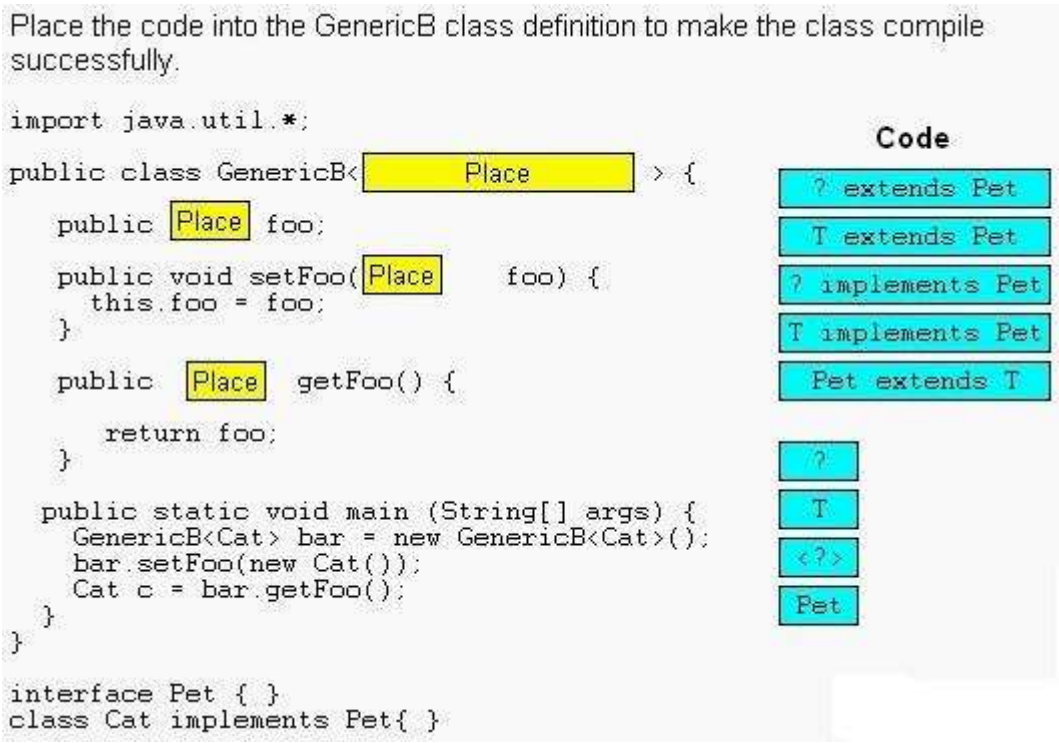
```
1. import java.util.*;
2. public class TestGenericConversion {
3.   public static void main(String[] args) {
4.     List<String> list = new LinkedList<String>();
5.     list.add("one");
6.     list.add("two");
7.     System.out.print( list.get(0).length() );
8.   }
9. }
```

Code

List list = new LinkedList();	
	System.out.print(list.get<String>(0).length());
List<String> list = new LinkedList();	System.out.print(<String>list.get(0).length());
List list = new LinkedList<String>();	System.out.print(((List<String>)list.get(0)).length());

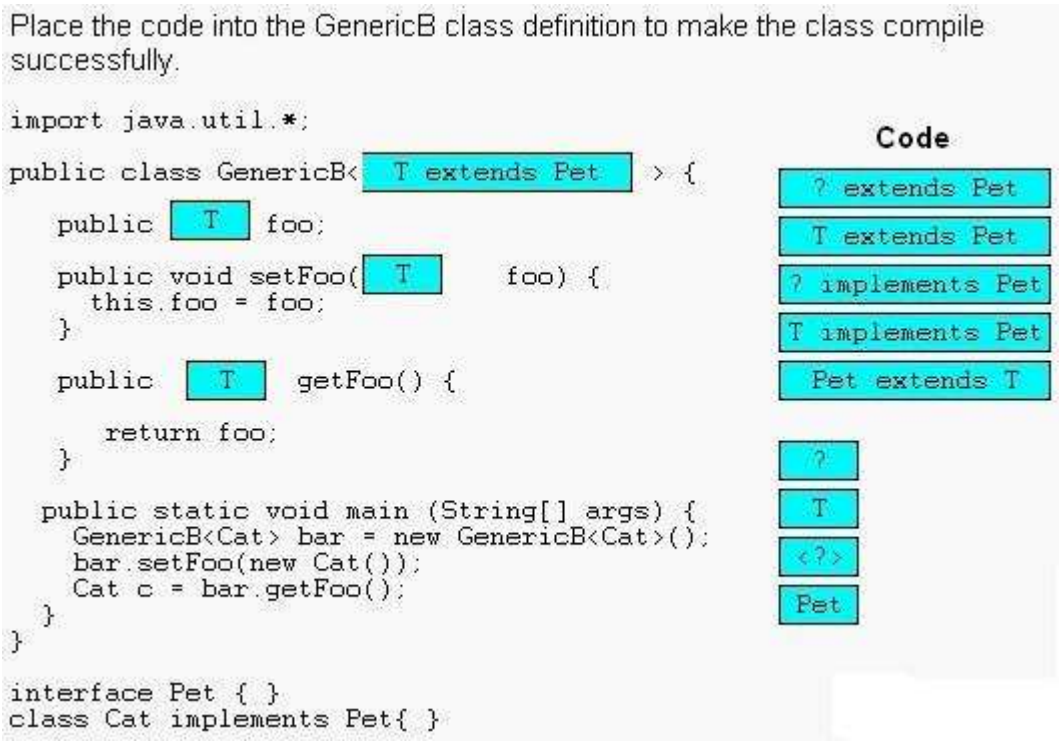
QUESTION 29

Place the code into the GenericB class definition to make the class compile successfully.



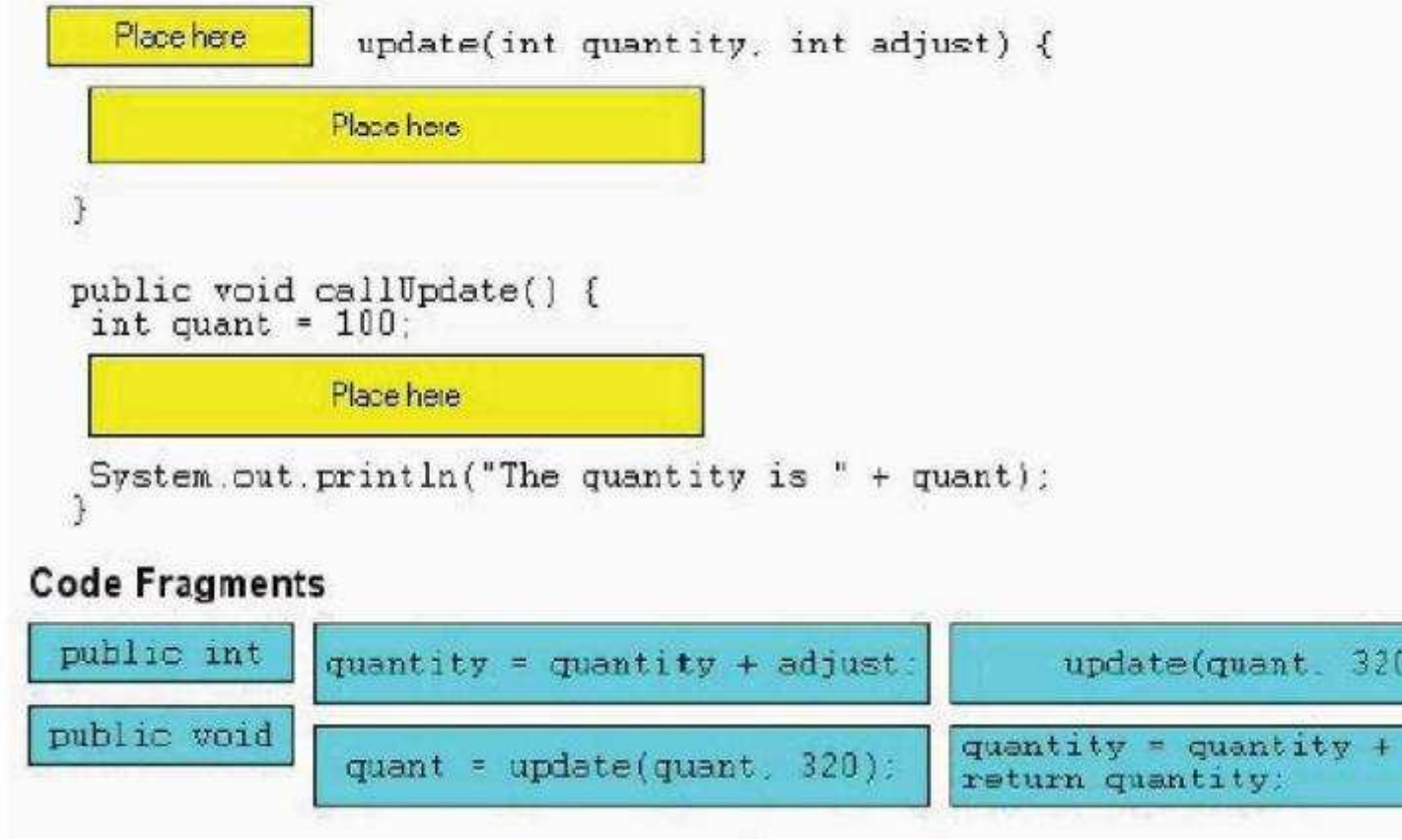
Answer:

Place the code into the GenericB class definition to make the class compile successfully.



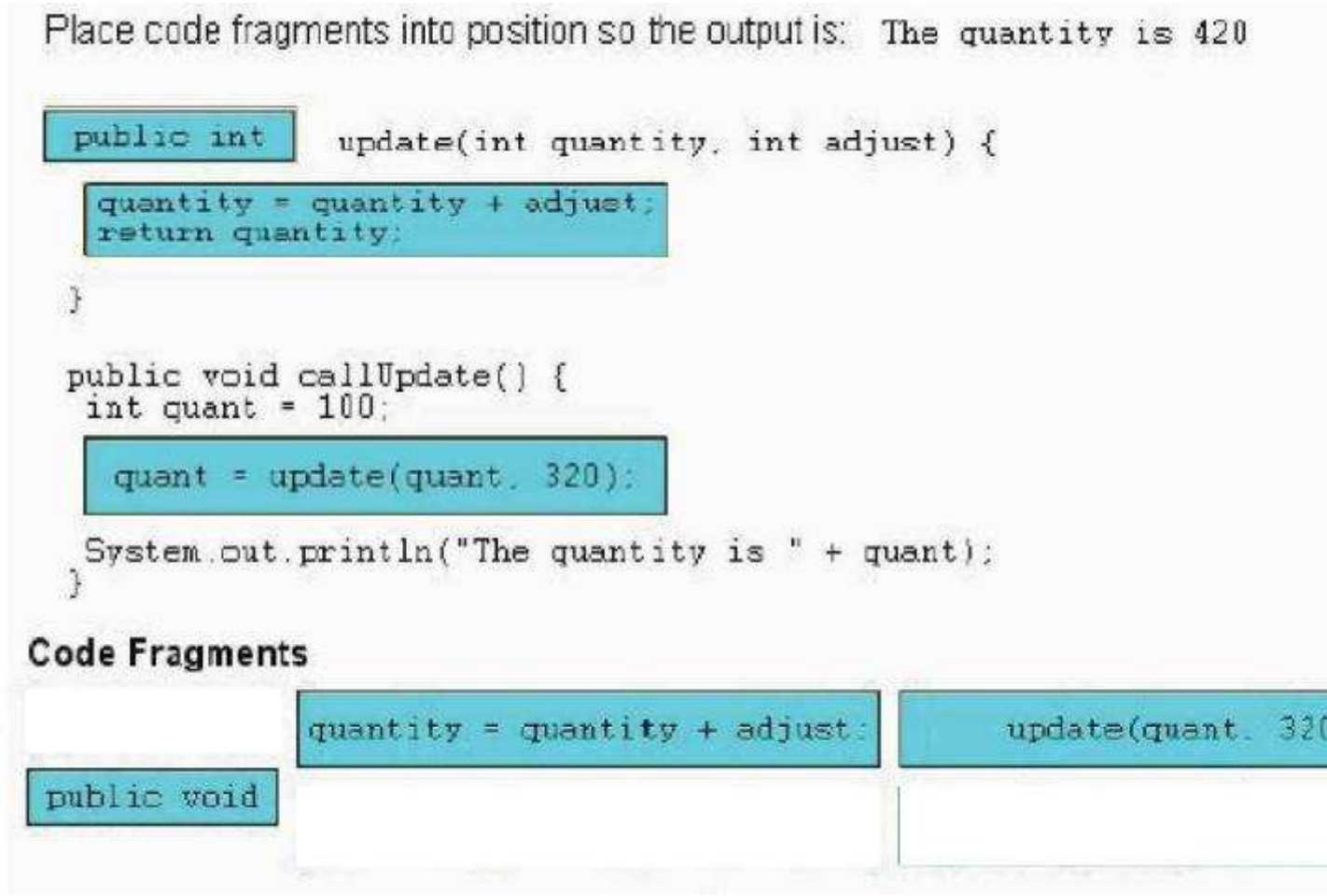
QUESTION 30

Place code fragments into position so the output is: `The quantity is 420`



Code Fragments

Answer:



QUESTION 31
Given:

```
import java.util.TreeSet;
public class Explorer2 {
    public static void main(String[] args) {
        TreeSet<Integer> s = new TreeSet<Integer>();
        TreeSet<Integer> subs = new TreeSet<Integer>();
        for(int i = 606; i < 613; i++)
            if(i%2 == 0) s.add(i);
        subs = (TreeSet)s.subSet(608, true, 611, true);
        s.add(629);
        System.out.println(s + " " + subs);
    }
}
```

What is the result?

A. Compilation fails.
B. An exception is thrown at runtime.
C. [608, 610, 612, 629] [608, 610]
D. [608, 610, 612, 629] [608, 610, 629]
E. [606, 608, 610, 612, 629] [608, 610]
F. [606, 608, 610, 612, 629] [608, 610, 629]

Answer: E

QUESTION 32
Which can appropriately be thrown by a programmer using Java SE technology to create a desktop application?

A. ClassCastException
B. NullPointerException
C. NoClassDefFoundError
D. NumberFormatException
E. ArrayIndexOutOfBoundsException

Answer: D