1. Language Fundamentals

Q: 1 Given
10. class Foo {
11. static void alpha() { /* more code here */ }
12. void beta() { /* more code here */ }Page 2 of 14Attention:
13. }

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: B, C

Q: 2 Given:
12. public class Yippee2 {
13.
14. static public void main(String [] yahoo) {
15. for(int x = 1; x < yahoo.length; x++) {
16. System.out.print(yahoo[x] + " ");
17. }
18. }
19. }
and the command line invocation:
java Yippee2 a b c

What is the result?
A. a b
B. b c
C. a b c
D. Compilation fails.
E. An exception is thrown at runtime.
Answer: B

Q: 3 Given:
15. public class Yippee {
16. public static void main(String [] args) {
17. for(int x = 1; x < args.length; x++) {
18. System.out.print(args[x] + " ");
19. }
20. }
21. }
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

Q: 4 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. // insert code here
2.
3. public class Demo {
4. public static void main(String[] args) {
5. System.out.println(twice("pizza"));
6. }
7. }
```

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

Q: 5 A JavaBeans component has the following field:
```
11. private boolean enabled;
```
Which two pairs of method declarations follow the JavaBeans standard for accessing this field? (Choose two.)
A. public void setEnabled(boolean enabled)
public boolean getEnabled()

B. public void setEnabled(boolean enabled)
public void isEnabled()
C. public void setEnabled(boolean enabled)
public boolean isEnabled()

D. public boolean setEnabled(boolean enabled)
public boolean getEnabled()

Answer: A, C

Q: 6
Given classes defined in two different files:
1. package util;
2. public class BitUtils {
3. public static void process(byte[]) { /* 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

Q: 7 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

Q: 8 Given:
11. public abstract class Shape {
12. private int x;
13. private int y;
14. public abstract void draw();

```
15. public void setAnchor(int x, int y) {
16. this.x = x;
17. this.y = y;
18. }
19. }
```

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: B, E

Q: 09 Given:

10. class Nav{
11. public enum Direction { NORTH, SOUTH, EAST, WEST }
12. }
13. public class Sprite{
14. // insert code here
15. }

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

Q: 10 Click the Exhibit button.
Which three statements are true? (Choose three.)

```
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[] argv
) {
32.     new Beta().testFoo();
33.   }
34. }
```

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: B, E, F

Q: 11 Click the Task button.

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
                [Place here]  [Place here]  {
  [Place here]
}
```

Code Fragments

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

Solution:

```
interface Reloadable{
   public void reload();
   }
class Edit{
   public void edit(){/* Edit Here*/}
}
 interface Displayable
                  extends   Reloadable {
    public void display();
 }
```

Q:12 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: A, D

Q: 13 Given:

```
55. int [] x = {1, 2, 3, 4, 5};
56. int y[] = x;
57. System.out.println(y[2]);
```

Which statement is true?

A. Line 57 will print the value 2.
B. Line 57 will print the value 3.
C. Compilation will fail because of an error in line 55.
D. Compilation will fail because of an error in line 56.

Answer: B

Q: 14

A programmer needs to create a logging method that can accept an arbitrary number of arguments. For example, it may be called in these ways:

```
logIt("log message1");
logIt("log message2","log message3");
logIt("log message4","log message5","log message6");
```

Which declaration satisfies this requirement?

A. public void logIt(String * msgs)
B. public void logIt(String [] msgs)
C. public void logIt(String... msgs)
D. public void logIt(String msg1, String msg2, String msg3)

Answer: C

Q: 15
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: A, B

Q: 16 Given:
```
11. public static void main(String[] args) {
12. String str = "null";
13. if (str == null) {
14. System.out.println("null");
15. } else (str.length() == 0) {
16. System.out.println("zero");
17. } else {
18. System.out.println("some");
19. }
20. }
```

What is the result?
A. null
B. zero
C. some
D. Compilation fails.
E. An exception is thrown at runtime.
Answer: D

Q: 17 Click the Exhibit button.
Given:
```
34. Test t = new Test();
35. t.method(5);
```
What is the output from line 5 of the Test class?

```
1. public class Test {
2.   int x = 12;
3.   public void method(int x) {
4.     x+=x;
5.     System.out.println(x);
6.   }
7. }
```

A. 5
B. 10
C. 12
D. 17

E. 24 **Answer: B**

Q: 18 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: A, B, D

Question: 19
A programmer is designing a class to encapsulate the information about an inventory item. A JavaBeans component is needed to do this. The Inventoryltem class has private instance variables to store the item information:
10. private int itemId;
11. private String name;
12. private String description;
Which method signature follows the JavaBeans naming standards for modifying the itemld instance variable?
A. itemID(int itemId)
B. update(int itemId)
C. setItemId(int itemId)
D. mutateItemId(int itemId)
E. updateItemID(int itemId)

Answer: C

Question:20
Given a file GrizzlyBear.java:
1. package animals.mammals;
2.

3. public class GrizzlyBear extends Bear {
4. void hunt() {
5. Salmon s = findSalmon();
6. s.consume();
7. }
8. }
and another file, Salmon.java:
1. package animals.fish;
2.
3. public class Salmon extends Fish {
4. void consume() { /* do stuff */ }
5. }
Assume both classes are defined in the correct directories for theft packages, and that the Mammal class correctly defines the findSalmon() method. Which two changes allow this code to compile correctly? (Choose two.)
A. add public to the start of line 4 in Salmon.java
B. add public to the start of line 4 in GrizzlyBear.java
C. add import animals.mammals.*; at line 2 in Salmon.java
D. add import animals.fish.*; at line 2 in GrizzlyBear.java
E. add import animals.fish.Salmon.*; at line 2 in GrizzlyBear.java
F. add import animals.mammals.GrizzlyBear.*;at line 2 in Salmon.java

Answer: AD

Question:21
Given:
11. public class Barn {
12. public static void main(String[] args) {
13. new Barn().go("hi", 1);
14. new Barn().go("hi", "world", 2);
15. }
16. public void go(String... y, int x) {
17. System.out.print(y[y.length - 1] + " ");
18. }
19. }
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:22
Given:
11. class Mud {
12. // insert code here
13. 14. }
System.out.println("hi");
15. }

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 12, compile?
A. 0
B. 1
C. 2
D. 3
E. 4
F. 5
Answer: D

Question:23
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

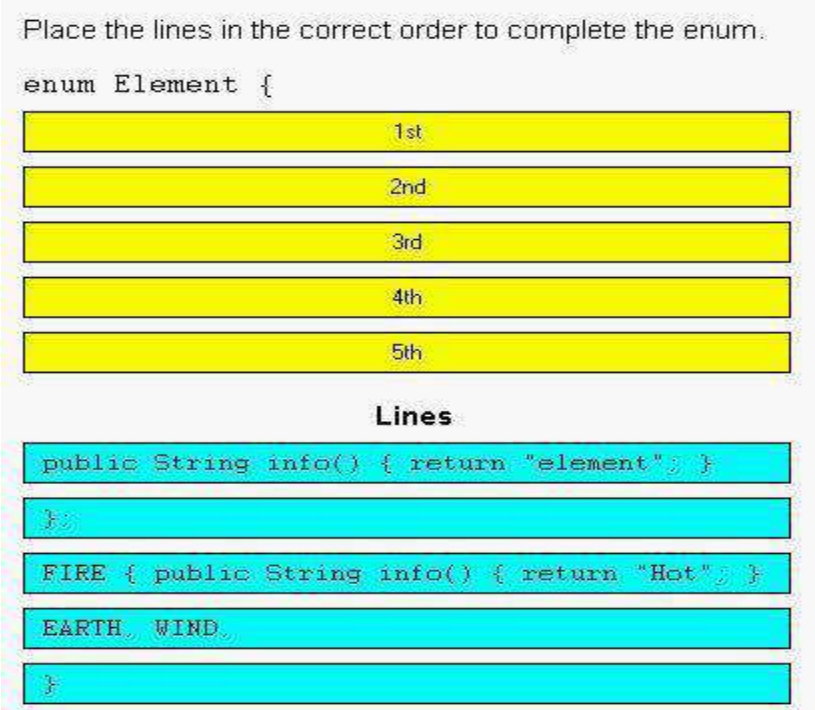
Question:24
```
1. public class Venus {
2. public static void main(String[] args) {
3. int [] x = {1,2,3};
4. int y[] = {4,5,6};
5. new Venus().go(x,y);
6. }
7. void go(int[]... z) {
8. for(int[] a : z)
9. System.out.print(a[0]);
10. }
11. } What is the result?
```
A. 1
B. 12
C. 14

D. 123
E. Compilation fails.
F. An exception is thrown at runtime.
Answer: C

Question:25
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: A,B

2. Declarations and Access Control

Q: 1 Click the Task button.



Solution:

```
enum Element{
   EARTH,WIND,
   FIRE{public String info(){return "Hot";}
   };
   public String info(){return "element";}
}
```

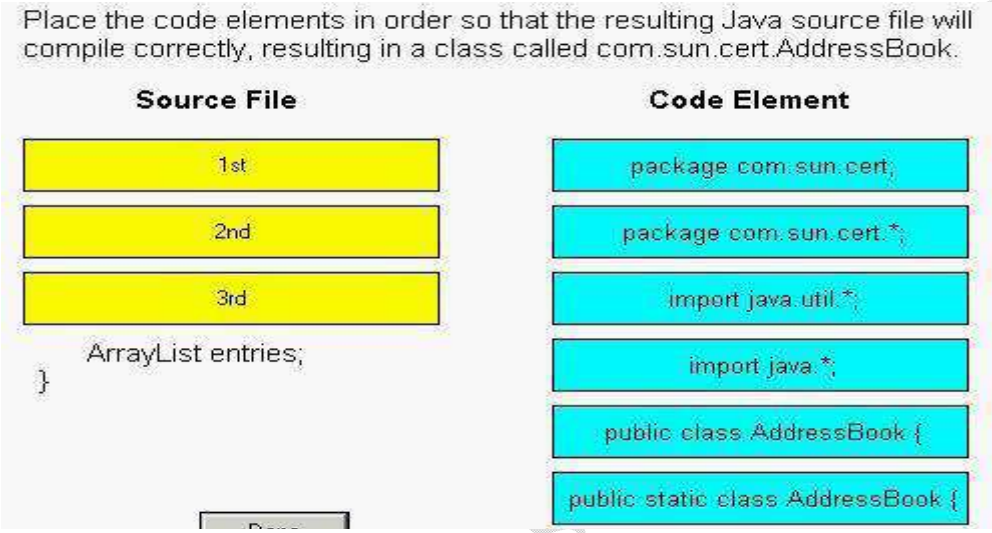
Q: 2 Given:
10. package com.sun.scjp;
11. public class Geodetics {
12. public static final double DIAMETER = 12756.32; // kilometers
13. }

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: A, C

Q: 3 Click the Task button.



Solution:

```
package com.sun.cert;
import java.util.*;
public class AddressBook{
   ArrayList entries;
}
```

Q: 4 Which two classes correctly implement both the java.lang.Runnable and the java.lang.Clonable interfaces? (Choose
A. public class Session
implements Runnable, Clonable {
public void run();
public Object clone();
}
B. public class Session
extends Runnable, Clonable {
public void run() { /* do something */ }
public Object clone() { /* make a copy */ }
C. public class Session
implements Runnable, Clonable {

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

Answer: C, D

Q: 5 Given classes defined in two different files:
1. package util;
2. public class BitUtils {
3. private static void process(byte[] b) {}
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. 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

Q: 6 Given:
11. class Cup { }
12. class PoisonCup extends Cup { }
...
21. public void takeCup(Cup c) {
22. if (c instanceof PoisonCup) {
23. System.out.println("Inconceivable!");
24. } else if (c instanceof Cup) {
25. System.out.println("Dizzying intellect!");
26. } else {
27. System.exit(0);
28. }
29. }
And the execution of the statements:
Cup cup = new PoisonCup();
takeCup(cup);
What is the output?
A. Inconceivable!
B. Dizzying intellect!
C. The code runs with no output.
D. An exception is thrown at runtime.
E. Compilation fails because of an error in line 22.

Answer: A

Q: 7 Click the Exhibit button.

```
public class A
{
    private int counter=0;
    public static int getInstanceCount()
   {
      return counter;
   }
   public A()
   {
     counter++;
   }
}
```

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?
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

Q:8 Given:

```
11. String[] elements = { "for", "tea", "too" };
12. 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

Q:09 Given:

```
11. interface DeclareStuff {
12. public static final int EASY = 3;
13. void doStuff(int t); }
14. public class TestDeclare implements DeclareStuff {
15. public static void main(String [] args) {
16. int x = 5;
17. new TestDeclare().doStuff(++x);
18. }
19. void doStuff(int s) {
20. s += EASY + ++s;
21. System.out.println("s " + s);
22. }
23. }
```

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

Q: 10 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

Q: 11 Given:
```
11. class Converter {
12. public static void main(String[] args) {
13. Integer i = args[0];
14. int j = 12;
15. System.out.println("It is " + (j==i) + " that j==i.");
16. }
17. }
```
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

Q: 12 Given:
```
10. int x = 0;
11. int y = 10;
12. do {
13. y--;
14. ++x;
15. } while (x < 5);
16. System.out.print(x + "," + y);
```
What is the result?
A. 5,6
B. 5,5
C. 6,5
D. 6,6
Answer: B
Q: 13 Given:
```
1. public interface A {
2. String DEFAULT_GREETING = "Hello World";
```

3. public void method1();
4. }
A programmer wants to create an interface called B that has A as its parent. Which interface declaration is correct?
A. public interface B extends A {}
B. public interface B implements A {}
C. public interface B instanceOf A {}
D. public interface B inheritsFrom A {}
Answer: A

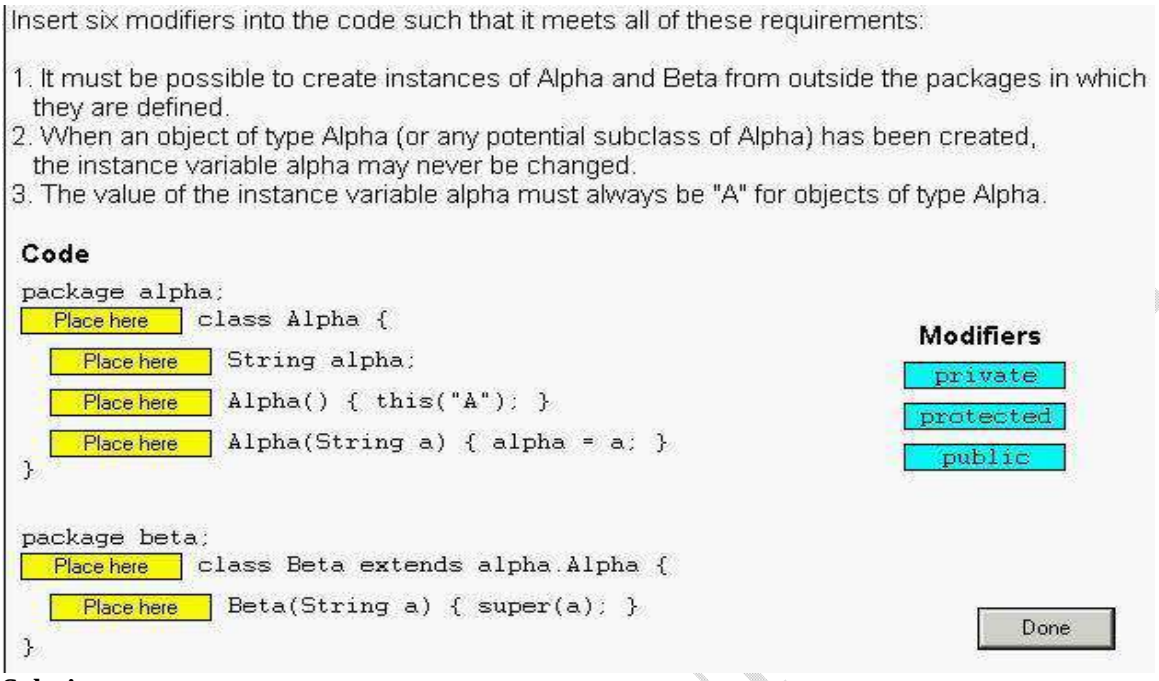
Q: 14 Given:
11. public enum Title {
12. MR("Mr."), MRS("Mrs."), MS("Ms.");
13. private final String title;
14. private Title(String t) { title = t; }
15. public String format(String last, String first) {
16. return title + " " + first + " " + last;
17. }
18. }
19. public static void main(String[] args) {
20. System.out.println(Title.MR.format("Doe", "John"));
21. }
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

Q: 15 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

Q: 16 Given:
11. public class Ball{
12. public enum Color { RED, GREEN, BLUE };
13. public void foo(){
14. // insert code here
15. { System.out.println(c); }
16. }
17. }
Which code inserted at line 14 causes the foo method to print RED, GREEN, and BLUE?

A. for(Color c : Color.values())
B. for(Color c = RED; c <= BLUE; c++)
C. for(Color c ; c.hasNext() ; c.next())
D. for(Color c = Color[0]; c <= Color[2]; c++)
E. for(Color c = Color.RED; c <= Color.BLUE; c++)
Answer: A

17 Click the Task button.



Solution:

```
package alpha;
public class Alpha{
private String alpha;
public  Alpha( ){ this("A") ; }
protected Alpha(String a){ alpha=a;  }
}
package beta;
public class Beta extends alpha.Alpha{
private Beta(String a){ super(a);  }
}
```

Q: 18 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. }
```

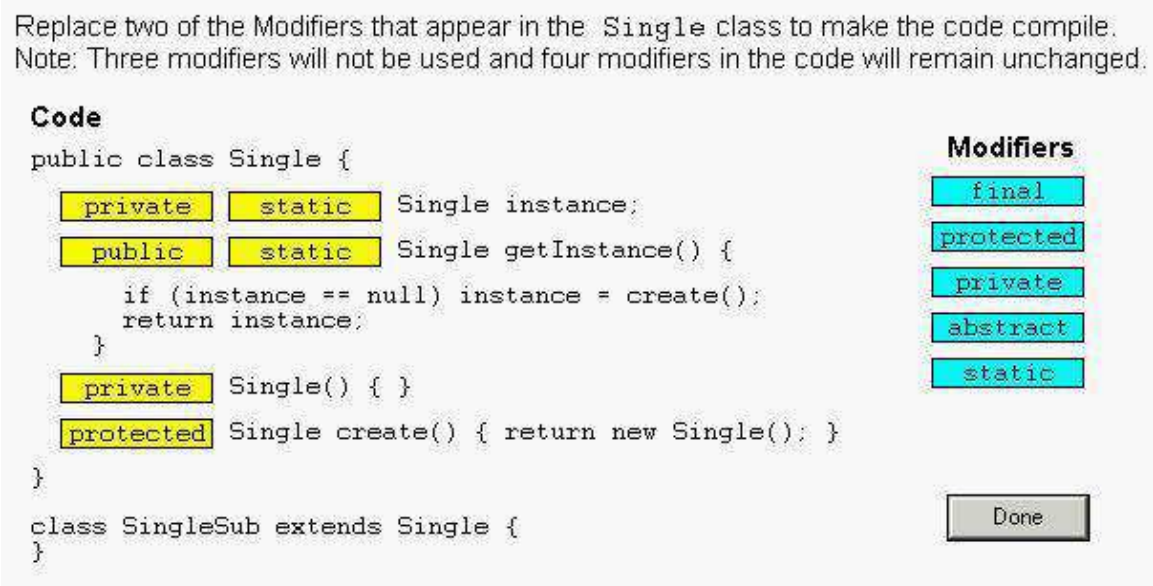
Which change can you make to Target without affecting Client?

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

Q: 19 Click the Task button.



Solution:

```
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 Shape{
  }
```

Q: 20 Given:

```
12. public class Test {
13. public enum Dogs {collie, harrier};
14. public static void main(String [] args) {
15. Dogs myDog = Dogs.collie;
16. switch (myDog) {
17. case collie:
18. System.out.print("collie ");
19. case harrier:
20. System.out.print("harrier ");
21. }
22. }
23. }
```

What is the result?

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

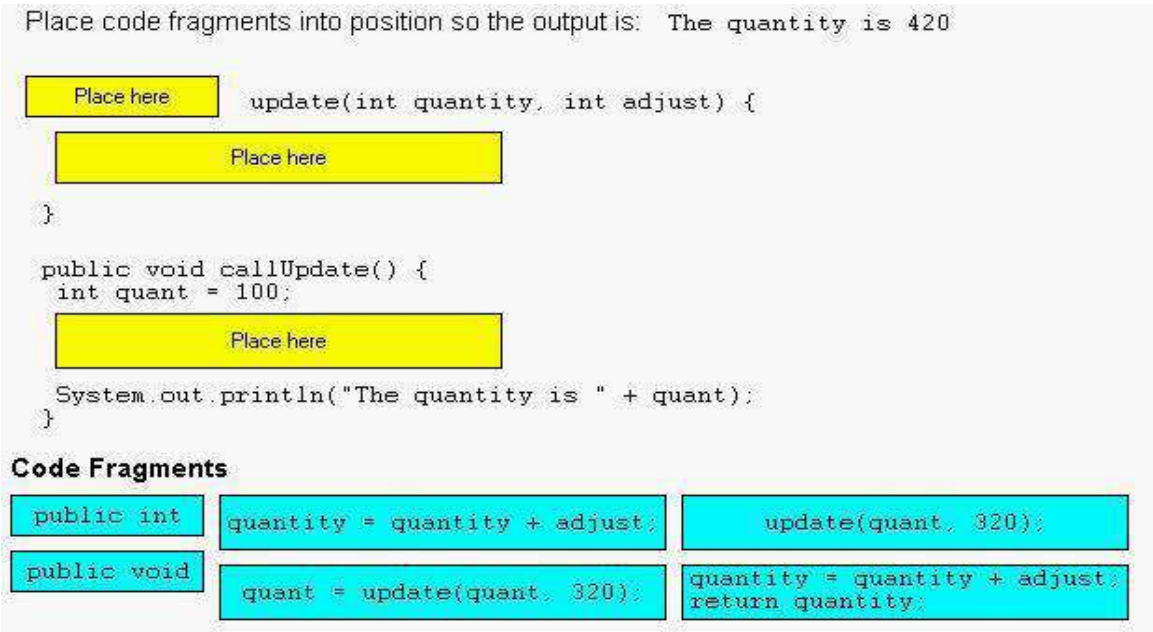
Q: 21 Click the Exhibit button.
Given:
ClassA a = new ClassA();
a.methodA();
What is the result?

```
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. }
```

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

Answer: D

Q: 22 Click the Task button.



Solution:

```
public int update(int quantity,int adjust){
quantity=quantity+adjust;
return quantity;
}
public void call Update( ) {
int quant=100;
quant=update(quant,320);
System.out.println("the quantity is " +quant);
}
```

Q: 23 Given:

```
1. package sun.scjp;
2. public enum Color { RED, GREEN, BLUE }
1. package sun.beta;
2. // insert code here
3. public class Beta {
4. Color g = GREEN;
5. public static void main( String[] argv)
6. { System.out.println( GREEN); }
7. }
```

The class Beta and the enum Color are in different packages.
Which two code fragments, inserted individually at line 2 of the Beta declaration, will allow this code to compile? (Choose two.)

A. import sun.scjp.Color.*;

B. import static sun.scjp.Color.*;
C. import sun.scjp.Color; import static sun.scjp.Color.*;
D. import sun.scjp.*; import static sun.scjp.Color.*;
E. import sun.scjp.Color; import static sun.scjp.Color.GREEN;

Answer: CE

Question 24
Given:

```
10. public class Fabric
11. public enum Color {
12. RED(0xff0000), GREEN(0x00ff00), BLUE(0x0000ff);
13. private final int rgb;
14. Color( int rgb) { this.rgb = rgb; }
15. public int getRGB() { return rgb; }
16. };
17. public static void main( String[] argv) {
18. // insert code here
19. }
20. }
```

Which two code fragments, inserted independently at line 18, allow the Fabric class to compile? (Choose two.)

A. Color skyColor = BLUE;
B. Color treeColor = Color.GREEN;
C. Color purple = new Color(0xff00ff);
D. if(RED.getRGB() < BLUE.getRGB()) {}
E. Color purple = Color.BLUE + Color.RED;
F. if(Color.RED.ordinal() < Color.BLUE.ordinal()) {}

Answer: BF

Question 25
Given:

```
11. public class Rainbow {
12. public enum MyColor {
13. RED(0xff0000), GREEN(0x00ff00), BLUE(0x0000ff);
14. private final int rgb;
15. MyColor(int rgb) { this.rgb = rgb; }
16. public int getRGB() { return rgb; }
17. };
18. public static void main(String[] args) {
19. // insert code here
20. }
21. }
```

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 26
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

3. Operators

Q: 01 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

Q: 02 Given the command line java Pass2 and:

```
15. public class Pass2 {
16. public void main(String [] args) {
17. int x = 6;
18. Pass2 p = new Pass2();
19. p.doStuff(x);
20. System.out.print(" main x = " + x);
21. }
22.
23. void doStuff(int x) {
24. System.out.print(" doStuff x = " + x++);
25. }
26. }
```

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

Q: 03 Given:

```
13. public class Pass {
14. public static void main(String [] args) {
15. int x = 5;
16. Pass p = new Pass();
17. p.doStuff(x);
18. System.out.print(" main x = " + x);
19. }
20.
21. void doStuff(int x) {
22. System.out.print(" doStuff x = " + x++);
23. }
24. }
```

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: 04

Given:

```
42. public class ClassA {
43. public int getValue() {
44.int value=0;
45. boolean setting = true;
46. String title="Hello";
47. if (value || (setting && title == "Hello")) { return 1; }
48. if (value == 1 & title.equals("Hello")) { return 2; }
49. }
50. }
```

And:

```
70. ClassA a = new ClassA();
```

71. a.getValue();
What is the result?
A. 1
B. 2
C. Compilation fails.
D. The code runs with no output.
E. An exception is thrown at runtime.
Answer: C

Question: 05
Given:
```
3. public class Batman {
4. int squares = 81;
5. public static void main(String[] args) {
6. new Batman().go();
7. }
8. void go() {
9. incr(++squares);
10. System.out.println(squares);
11. }
12. void incr(int squares) { squares += 10; }
13. }
```
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: 06
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: 07
Given:

```
3. public class Spock {
4. public static void main(String[] args) {
5. Long tail = 2000L;
6. Long distance = 1999L;
7. Long story = 1000L;
8. if((tail > distance) ^ ((story * 2) == tail))
9. System.out.print("1");
10. if((distance + 1 != tail) ^ ((story * 2) == distance))
11. System.out.print("2");
12. }
13. }
```

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.

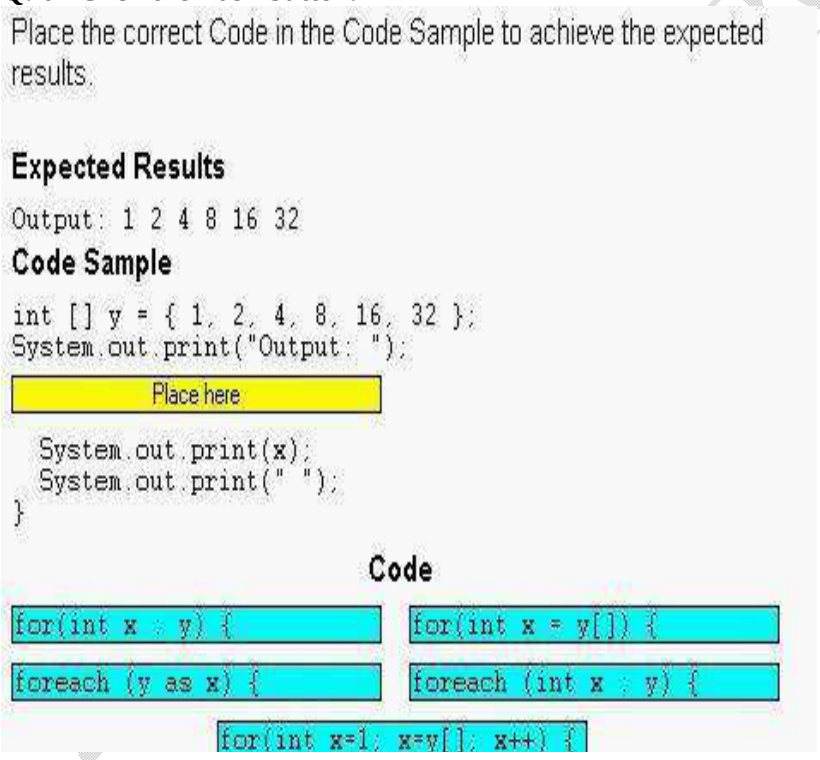
Answer: E

4. Flow Control

Q: 01 Given:
10. public class Bar {
11. static void foo(int... x) {
12. // insert code here
13. }
14. }
Which two code fragments, inserted independently at line 12, will allow the class to compile? (Choose two.)
A. foreach(x) System.out.println(z);
B. for(int z : x) System.out.println(z);
C. while(x.hasNext()) System.out.println(x.next());
D. for(int i=0; i< x.length; i++) System.out.println(x[i]);

Answer: B, D

Q: 02 Click the Task button.



Solution:
int [ ] y={1,2,4,8,16,32};
System.out.print("output : ");
for(int x : y) {
System.out.println(x);
System.out.println(" ");

Q: 03 Given:
25. int x = 12;
26. while (x < 10) {
27. x--;
28. }
29. System.out.print(x);
What is the result?
A. 0
B. 10
C. 12
D. Line 29 will never be reached.
Answer: C

Q: 04 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

Q: 05 Given:
11. public static void main(String[] args) {
12. for (int i = 0; i <= 10; i++) {

13. if (i > 6) break;
14. }
15. System.out.println(i);
16. }
What is the result?
A. 6
B. 7
C. 10
D. 11
E. Compilation fails.
F. An exception is thrown at runtime.
Answer: E

Q: 06 Given:
11. public static void main(String[] args) {
12. Integer i = new Integer(1) + new Integer(2);
13. switch(i) {
14. case 3: System.out.println("three"); break;
15. default: System.out.println("other"); break;
16. }
17. }
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
Q: 07 Given:
10. public class ClassA {
11. public void count(int i) {
12. count(++i);
13. }
14. }
And:
20. ClassA a = new ClassA();
21. a.count(3);
Which exception or error should be thrown by the virtual machine?
A. StackOverflowError
B. NullPointerException
C. NumberFormatException
D. IllegalArgumentException
E. ExceptionInInitializerError

Answer: A
Q: 08 Given:
22. public void go() {
23. String o = "";
24. z:

```
25. for(int x = 0; x < 3; x++) {
26. for(int y = 0; y < 2; y++) {
27. if(x==1) break;
28. if(x==2 && y==1) break z;
29. o = o + x + y;
30. }
31. }
32. System.out.println(o);
33. }
```

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

Q: 09 Given:

```
3. public class Breaker {
4. static String o = "";
5. public static void main(String[] args) {
6. z:
7. o = o + 2;
8. for(int x = 3; x < 8; x++) {
9. if(x==4) break;
10. if(x==6) break z;
11. o = o + x;
12. }
13. System.out.println(o);
14. }
15. }
```

What is the result?

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

G. Compilation fails.
Answer: G
Q: 10 Given:
35. int x = 10;
36. do { 37. x--;
38. } while (x < 10);
How many times will line 37 be executed?
A. ten times
B. zero times
C. one to nine times
D. more than ten times
Answer: D

5. Exception Handling

Q: 01 Given:

```
11. public static void parse(String str) {
12. try {
13. float f = Float.parseFloat(str);
14. } catch (NumberFormatException nfe) {
15. f = 0;
16. } finally {
17. System.out.println(f);
18. }
19. }
20. public static void main(String[] args) {
21. parse("invalid");
22. }
```

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

Q: 02 Given:

```
84. try {
85. ResourceConnection con = resourceFactory.getConnection();
86. Results r = con.query("GET INFO FROM CUSTOMER");
87. info = r.getData();
88. con.close();
89. } catch (ResourceException re) {
90. errorLog.write(re.getMessage());
91. }
92. 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

Q: 03 Given:

```
31. // some code here
32. try {
33. // some code here
34. } catch (SomeException se) {
35. // some code here
36. } finally {
37. // some code here
```

38. }

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: B, C, E

Q: 04 Given:
```
11. class A {
12. public void process() { System.out.print("A,"); }
13. class B extends A {
14. public void process() throws IOException {
15. super.process();
16. System.out.print("B,");
17. throw new IOException();
18. }
19. public static void main(String[] args) {
20. try { new B().process(); }
21. catch (IOException e) { System.out.println("Exception"); }}
```
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

Q: 05 Given:
```
11. static void test() throws Error {
12. if (true) throw new AssertionError();
13. System.out.print("test ");
14. }
15. public static void main(String[] args) {
16. try { test(); }
17. catch (Exception ex) { System.out.print("exception "); }
18. System.out.print("end ");
19. }
```
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

Q: 06 Given:

```
11. Float pi = new Float(3.14f);
12. if (pi > 3) {
13. System.out.print("pi is bigger than 3. ");
14. }
15. else {
16. System.out.print("pi is not bigger than 3. ");
17. }
18. finally {
19. System.out.println("Have a nice day.");
20. }
```

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

Q: 07 Given:

```
11. public static void main(String[] args) {
12. try {
13. args = null;
14. args[0] = "test";
15. System.out.println(args[0]);
16. } catch (Exception ex) {
17. System.out.println("Exception");
18. } catch (NullPointerException npe) {
19. System.out.println("NullPointerException");
20. }
21. }
```

What is the result?

A. test

B. Exception
C. Compilation fails.
D. NullPointerException
Answer: C

Q:08 Click the Exhibit button.
Given:

```
25. try {
26. A a = new A();
27. a.method1();
28. } catch (Exception e) {
29. System.out.print("an error occurred");
30. }
```

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

```
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. }
```

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: B, E

Q:09 Given:
11. static void test() throws RuntimeException {
12. try {
13. System.out.print("test ");
14. throw new RuntimeException();
15. }

16. catch (Exception ex) { System.out.print("exception "); }
17. }
18. public static void main(String[] args) {
19. try { test(); }
20. catch (RuntimeException ex) { System.out.print("runtime "); }
21. System.out.print("end ");
22. }
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

Q:10 Given:
33. try {
34. // some code here
35. } catch (NullPointerException e1) {
36. System.out.print("a");
37. } catch (RuntimeException e2) {
38. System.out.print("b");
39. } finally {
40. System.out.print("c");
41. }
What is the result if a NullPointerException occurs on line 34?
A. c
B. a
C. ab
D. ac
E. bc
F. abc
Answer: D

Q:11 Given:
10. public class Foo {
11. static int[] a;
12. static { a[0]=2; }
13. public static void main(String[] args) {}
14. }
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

Q: 12 Given:
```
11. static void test() {
12. try {
13. String x = null;
14. System.out.print(x.toString() + " ");
15. }
16. finally { System.out.print("finally "); }
17. }
18. public static void main(String[] args) {
19. try { test(); }
20. catch (Exception ex) { System.out.print("exception "); }
21. }
```

What is the result?
A. null
B. finally
C. null finally
D. Compilation fails.
E. finally exception

Answer: E

Q: 13 Click the Exhibit button.
Given:
```
31. public void method() {
32. A a = new A();
33. a.method1();
34. }
```
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.     }
6.   }
7. }

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

1. public 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

Q: 14 Click the Exhibit button.
Which statement is true about the two classes?

SomeException:

```
1. public class SomeException {
2. }
```

Class A:

```
1. public class A {
2.    public void doSomething() { }
3. }
```

Class B:

```
1. public class B extends A {
2.    public void doSomething() throws
SomeException { }
3. }
```

A. Compilation of both classes will fail.
B. Compilation of both classes will succeed.
C. Compilation of class A will fail. Compilation of class B will succeed.
D. Compilation of class B will fail. Compilation of class A will succeed.
Answer: D

Question: 15
Click the Exhibit button.

Class TestException
1. public class TestException extends Exception {
2. }
Class A:
1. public class A {
2.
3. public String sayHello(String name) throws TestException {
4.
5. if(name == null) {
6. throw new TestException();
7. }
8.
9. return "Hello "+ name;
10. }
11.
12. }
A programmer wants to use this code in an application:
***45.* A a=new A();**
46. System.out.println(a.sayHello("John"));
Which two are true? (Choose two.)
A. Class A will not compile.
B. Line 46 can throw the unchecked exception TestException.
C. Line *45* can throw the unchecked exception TestException.
D. Line 46 will compile if the enclosing method throws a TestException.
E. Line 46 will compile if enclosed in a try block, where TestExceptionis caught**.**

Answer: DE
Question:16
Given:
11.classA *{*
12. public void process() *{* System.out.print("A "); *} }*
13. class B extends A *{*
14. public void process() throws RuntimeException *{*
15. super.process();
16. if (true) throw new RuntimeException();
17. System.out.print("B"); *}}*
18. public static void main(String[] args) *{*
19. try *{* ((A)new B()).process(); *}*
20. catch (Exception e) *{* System.out.print("Exception "); *}*
21. *}*
What is the result?
A. Exception
B. A Exception
C. A Exception B
D. A B Exception
E. Compilation fails because of an error in line 14.
F. Compilation fails because of an error in line 19.
Answer: B
Question:17
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: D,F
Question:18
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

6. Asserions

Q: 01 Given:
8. public class test {
9. public static void main(String [] a) {
10. assert a.length == 1;
11. }
12. }
Which two will produce an AssertionError? (Choose two.)
A. java test
B. java -ea test
C. java test file1
D. java -ea test file1
E. java -ea test file1 file2
F. java -ea:test test file1
Answer: B, E

Q: 02 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

Q: 03 Given:
23. int z = 5;
24.
25. public void stuff1(int x) {
26. assert (x > 0);
27. switch(x) {
28. case 2: x = 3;
29. default: assert false; } }
30.
31. private void stuff2(int y) { assert (y < 0); }
32.
33. private void stuff3() { assert (stuff4()); }
34.

35. private boolean stuff4() { z = 6; return false; }

Which statement is true?
A. All of the assert statements are used appropriately.
B. Only the assert statement on line 31 is used appropriately.
C. The assert statements on lines 29 and 31 are used appropriately.
D. The assert statements on lines 26 and 29 are used appropriately.
E. The assert statements on lines 29 and 33 are used appropriately.
F. The assert statements on lines 29, 31, and 33 are used appropriately.
G. The assert statements on lines 26, 29, and 31 are used appropriately.
Answer: C

Question: 04
Click the Exhibit button.

```
1. public class Test {
2.
3. public static void main(String [] args) {
4. boolean assert = true;
5. if(assert) {
6. System.out.println(”assert is true”);
7. }
8. }
9.
10. }
```

Given:
javac -source 1.3 Test.java

What is the result?
A. Compilation fails.
B. Compilation succeeds with errors.
C. Compilation succeeds with warnings.
D. Compilation succeeds without warnings or errors.
Answer: C

Question: 05
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: 06
Given:
1. public class Donkey2 {
2. public static void main(String[] args) {
3. boolean assertsOn = true;
4. assert (assertsOn) : assertsOn = true;
5. if(assertsOn) {
6. System.out.println("assert is on");
7. }
8. }
9. }
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: 07
Given:
1. public class Donkey {
2. public static void main(String[] args) {
3. boolean assertsOn = false;
4. assert (assertsOn) : assertsOn = true;
5. if(assertsOn) {
6. System.out.println("assert is on");
7. }
8. }
9. }
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: 08
Given:
11. public void go(int x) {
12. assert (x > 0);
13. switch(x) {
14. case 2: ;
15. default: assert false;
16. }
17. }
18. private void go2(int x) { assert (x < 0); }
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

7. Garbage Collections

Q: 01 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

Q: 02 Given:

```
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

Q: 03 Given:
11. rbo = new ReallyBigObject();
12. // more code here
13. rbo = null;
14. /* insert code here */
Which statement should be placed at line 14 to suggest that the virtual machine expend effort toward
recycling the memory used by the object rbo?
A. System.gc();
B. Runtime.gc();
C. System.freeMemory();
D. Runtime.getRuntime().growHeap();
E. Runtime.getRuntime().freeMemory();
Answer: A

Q: 04 Given:
11. class Snoochy {
12. Boochy booch;
13. public Snoochy() { booch = new Boochy(this); }
14. }
15.
16. class Boochy {
17. Snoochy snooch;
18. public Boochy(Snoochy s) { snooch = s; }
19. }
And the statements:
21. public static void main(String[] args) {
22. Snoochy snoog = new Snoochy();
23. snoog = null;
24. // more code here
25. }
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: 05
Which two are true? (Choose two.)
A. A finalizer may NOT be invoked explicitly.
B. The finalize method declared in class Object takes no action.
C. super.finalize() is called implicitly by any overriding finalize method.
D. The finalize method for a given object will be called no more than
once by the garbage collector.
E. The order in which finalize will be called on two objects is based on

the order in which the two objects became finalizable.
Answer: BD
Question: 06
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: 07
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();
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: 07
Given:
5. public class Tahiti {

```
6. Tahiti t;
7. public static void main(String[] args) {
8. Tahiti t = new Tahiti();
9. Tahiti t2 = t.go(t);
10. t2 = null;
11. // more code here
12. }
13. Tahiti go(Tahiti t) {
14. Tahiti t1 = new Tahiti(); Tahiti t2 = new Tahiti();
15. t1.t = t2; t2.t = t1; t.t = t2;
16. return t1;
17. }
18. }
```

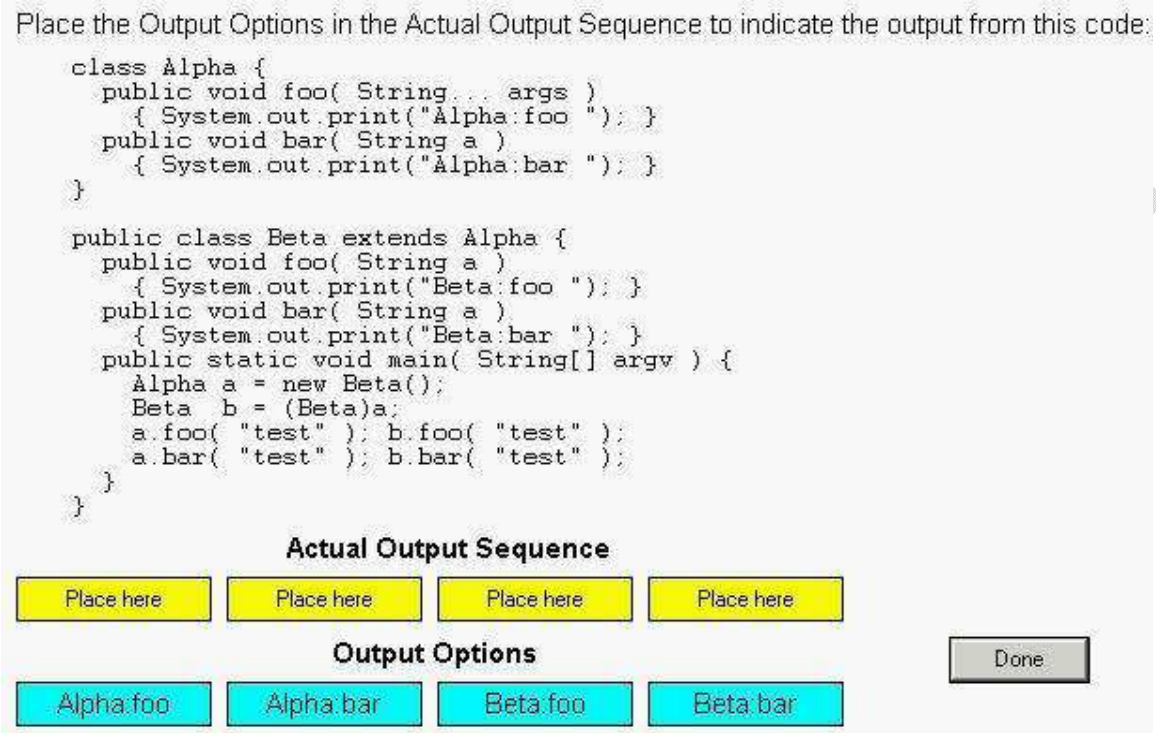
When line 11 is reached, how many objects are eligible for garbage collection?

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

Answer: A

8.OOPs

Q: 01 Click the Task button.



Solution:
Alpha.foo Beta.bar Beta.foo Beta.bar

Q: 02 Given:
1. public class Plant {
2. private String name;
3. public Plant(String name) { this.name = name; }
4. public String getName() { return name; }
5. }
1. public class Tree extends Plant {
2. public void growFruit() { }
3. public void dropLeaves() { }
4. }
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

Q: 03 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.
6.   public String execute() {
7.     // more code here
8.   }
9. }

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

Q: 04 Given:
11. public class Yikes {
12.
13. public static void go(Long n) {System.out.println("Long ");}
14. public static void go(Short n) {System.out.println("Short ");}
15. public static void go(int n) {System.out.println("int ");}
16. public static void main(String [] args) {
17. short y = 6;
18. long z = 7;
19. go(y);
20. go(z);
21. }
22. }
What is the result?
A. int Long
B. Short Long
C. Compilation fails.
D. An exception is thrown at runtime.

Answer: A

Q: 05 Click the Task button.

Given:

```
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());
  }
}
```

Place the names "A" and "B" in the following output.

class [Place here] has name [Place here]

class [Place here] has name [Place here]

Names: [A] [B]

[Done]

Solution:

class A has name A
class B hasname A

Q: 06 Which two statements are true about has-a and is-a relationships? (Choose two.)

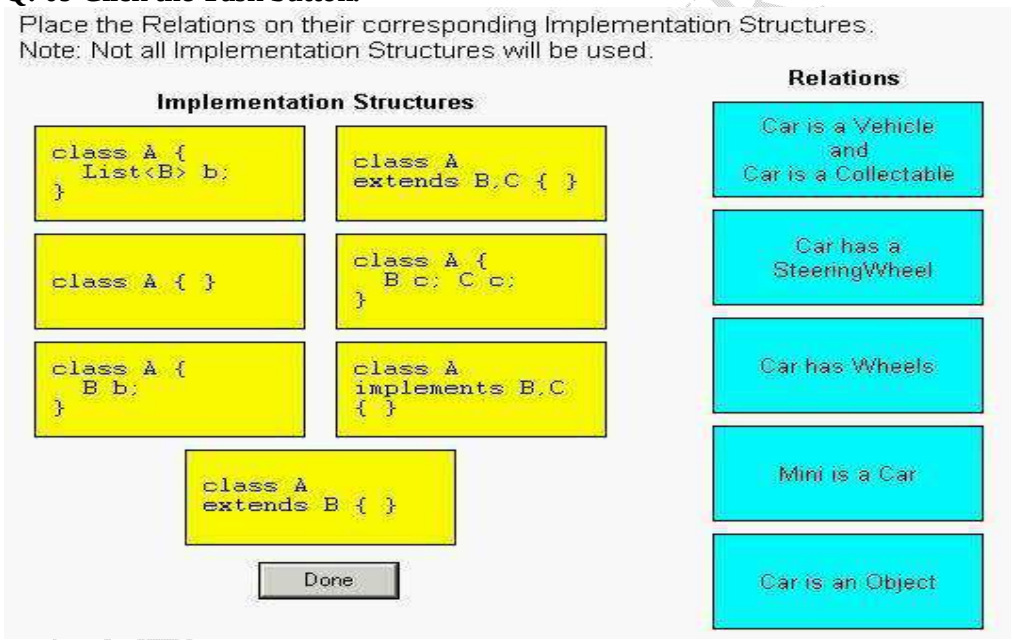
A. Inheritance represents an is-a relationship.
B. Inheritance represents a has-a relationship.
C. Interfaces must be used when creating a has-a relationship.

D. Instance variables can be used when creating a has-a relationship.
Answer: A, D

Q: 07 Given:
```
10: public class Hello {
11: String title;
12: int value;
13: public Hello() {
14: title += " World";
15: }
16: public Hello(int value) {
17: this.value = value;
18: title = "Hello";
19: Hello();
20: }
21: }
```
and:
```
30: Hello c = new Hello(5);
31: 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

Q: 08 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: C, D

Q: 09 Click the Task button.



Solution:

Car is a Vehicle and car is a Collectable < ==========> **class A implements B , C { }**

Car has a Steering Wheel < ==========> **class A { B b; }**

car has Wheels **< ==========> class A{ List <B> b; }**

Mini is a Car **< ==========> class A extends B{ }**

Car is an Object **< ==========> class A { }**

Q: 10 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

Q: 11 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

Q: 12 Given:
```
1. public class Base {
2. public static final String FOO = "foo";
3. public static void main(String[] args) {
4. Base b = new Base();
5. Sub s = new Sub();
6. System.out.print(Base.FOO);
7. System.out.print(Sub.FOO);
8. System.out.print(b.FOO);
9. System.out.print(s.FOO);
10. System.out.print(((Base)s).FOO);
11. } }
12. 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

Q: 13 Which two statements are true? (Choose two.)
A. An encapsulated, public class promotes re-use.
B. Classes that share the same interface are always tightly encapsulated.
C. An encapsulated class allows subclasses to overload methods, but does NOT allow overriding methods.
D. An encapsulated class allows a programmer to change an implementation without affecting outside code.
Answer: A, D

Q: 14 Given:

```
11. public static void test(String str) {
12. if (str == null | str.length() == 0) {
13. System.out.println("String is empty");
14. } else {
15. System.out.println("String is not empty");
16. }
17. }
```

And the invocation:

```
31. test(null);
```

What is the result?

A. An exception is thrown at runtime.
B. "String is empty" is printed to output.
C. Compilation fails because of an error in line 12.
D. "String is not empty" is printed to output.

Answer: A

Q: 15 Given:

```
12. public class Wow {
13. public static void go(short n) {System.out.println("short");}
14. public static void go(Short n) {System.out.println("SHORT");}
15. public static void go(Long n) {System.out.println(" LONG");}
16. public static void main(String [] args) {
17. Short y = 6;
18. int z = 7;
19. go(y);
20. go(z);
21. }
22. }
```

What is the result?

A. short LONG
B. SHORT LONG
C. Compilation fails.
D. An exception is thrown at runtime.

Answer: C

Q: 16 Click the Exhibit button.

Which three code fragments, added individually at line 29, produce the output 100? (Choose three.)

```
10. class Inner {
11.   private int x;
12.   public void setX( int x ) { this.x = x;
}
13.   public int getX() { return x; }
14. }
15.
16. class Outer {
17.   private Inner y;
18.   public void setY( Inner y ) { this.y =
y; }
19.   public Inner getY() { return y; }
20. }
21.
22. public class Gamma {
23.   public static void main( String[] args
) {
24.     Outer o = new Outer();
25.     Inner i = new Inner();
26.     int n = 10;
27.     i.setX( n );
28.     o.setY( i );
29.     // insert code here
30.   System.out.println( o.getY().getX() );
31.   }
32. }
```

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: B, C, F

Q: 17 Given:
10. class One {
11. public One() { System.out.print(1); }
12. }
13. class Two extends One {
14. public Two() { System.out.print(2); }

15. }
16. class Three extends Two {
17. public Three() { System.out.print(3); }
18. }
19. public class Numbers{
20. public static void main(String[] argv) { new Three(); }
21. }
What is the result when this code is executed?
A. 1
B. 3
C. 123
D. 321
E. The code runs with no output.

Answer: C

Q: 18 Click the Exhibit button.
What is the outcome of the code?

```
 1. public class Item {
 2.   private String desc;
 3.   public String getDescription() { return
desc; }
 4.   public void setDescription(String d) {
desc = d; }
 5.
 6.   public static void modifyDesc(Item
item, String desc) {
 7.     item = new Item();
 8.     item.setDescription(desc);
 9.   }
10.   public static void main(String[] args)
{
11.     Item it = new Item();
12.     it.setDescription("Gobstopper");
13.     Item it2 = new Item();
14.     it2.setDescription("Fizzylifting");
15.     modifyDesc(it,
"Scrumdiddlyumptious");
16.
System.out.println(it.getDescription());
17.
System.out.println(it2.getDescription());
18.   }
19. }
```

A. Compilation fails.
B. Gobstopper
Fizzylifting
C. Gobstopper
Scrumdiddlyumptious
D. Scrumdiddlyumptious
Fizzylifting
E. Scrumdiddlyumptious

Answer: B

Q: 19 Given:

```
10. class One {
11. public One foo() { return this; }
12. }
13. class Two extends One {
14. public One foo() { return this; }
15. }
16. class Three extends Two {
17. // insert method here
18. }
```

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: C, D

Q: 20 Click the Exhibit button.

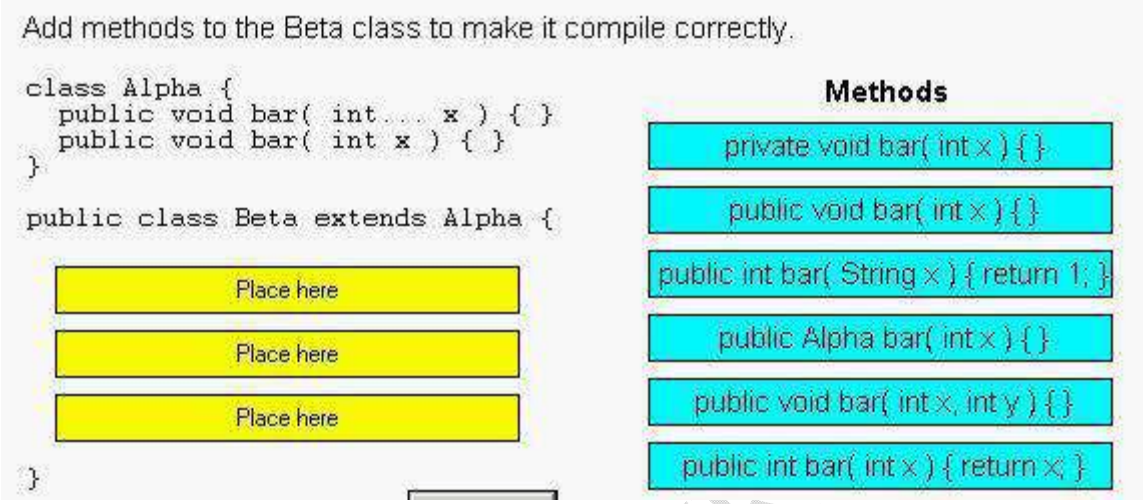
What is the output of the program shown in the exhibit?

```
10. class Foo {
11.  private int x;
12.  public Foo( int x ) { this.x = x; }
13.  public void setX( int x ) { this.x = x;
}
14.  public int getX() { return x; }
15. }
16.
17. public class Gamma {
18.
19.    static Foo fooBar( Foo foo ) {
20.      foo = new Foo( 100 );
21.      return foo;
22.    }
23.
24.    public static void main( String[] args
) {
25.    Foo foo = new Foo( 300 );
26.    System.out.print( foo.getX() + "-" );
27.
28.    Foo fooFoo = fooBar( foo );
29.    System.out.print( foo.getX() + "-" );
30.    System.out.print( fooFoo.getX() + "-"
);
31.
32.    foo = fooBar( fooFoo );
33.    System.out.print( foo.getX() + "-" );
34.    System.out.print( fooFoo.getX() );
35.    }
36. }
```

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

Q: 21 Click the Task button.



Solution:

public void bar(int x){ }
public int bar(String x){ return 1; }
public void bar(int x,int y) { }

Q: 22 Given:
10. interface A { public int getValue(); }
11. class B implements A {
12. public int getValue() { return 1; }
13. }
14. class C extends B {
15. // insert code here
16. }
Which three code fragments, inserted individually at line 15, make use of polymorphism? (Choose three.)
A. public void add(C c) { c.getValue(); }
B. public void add(B b) { b.getValue(); }
C. public void add(A a) { a.getValue(); }
D. public void add(A a, B b) { a.getValue(); }
E. public void add(C c1, C c2) { c1.getValue(); }

Answer: B, C, D

Q: 23 Click the Exhibit button.
What is the result?

```
11. public class Bootchy {
12.   int bootch;
13.   String snootch;
14.
15.   public Bootchy() {
16.     this("snootchy");
17.     System.out.print("first ");
18.   }
19.
20.   public Bootchy(String snootch) {
21.     this(420, "snootchy");
22.     System.out.print("second ");
23.   }
24.
25.   public Bootchy(int bootch, String
snootch) {
26.     this.bootch = bootch;
27.     this.snootch = snootch;
28.     System.out.print("third ");
29.   }
30.
31.   public static void main(String[] args)
{
32.     Bootchy b = new Bootchy();
33.     System.out.print(b.snootch + " " +
b.bootch);
34.   }
35. }
```

A. snootchy 420 third second first
B. snootchy 420 first second third
C. first second third snootchy 420
D. third second first snootchy 420
E. third first second snootchy 420
F. first second first third snootchy 420

Answer: D

Q: 24 Given:
10. abstract class A {
11. abstract void a1();
12. void a2() { }
13. }
14. class B extends A {
15. void a1() { }
16. void a2() { }
17. }

18. 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: A, B, D, F

Q: 25 Click the Exhibit button.

What is the result?

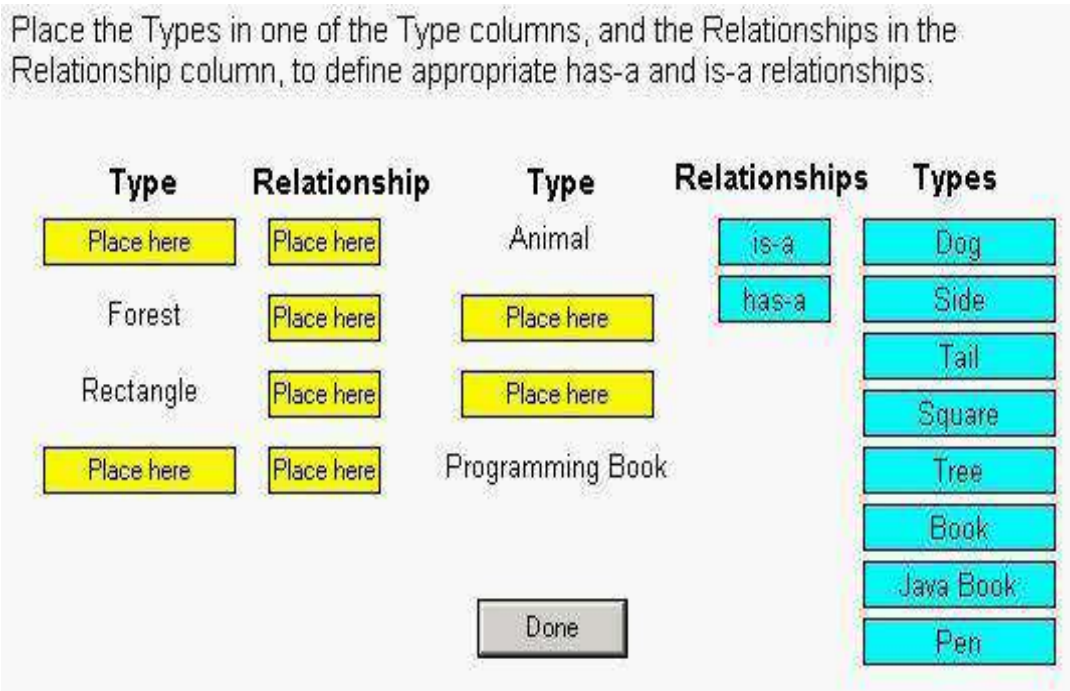
```
 1. public class SimpleCalc {
 2.   public int value;
 3.   public void calculate() { value += 7; }
 4. }

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

Q: 26 Given:
20. public class CreditCard {
21.
22. private String cardID;
23. private Integer limit;
24. public String ownerName;
25.

26. public void setCardInformation(String cardID,
27. String ownerName,
28. Integer limit) {
29. this.cardID = cardID;
30. this.ownerName = ownerName;
31. this.limit = limit;
32. }
33. }
Which statement is true?
A. The class is fully encapsulated.
B. The code demonstrates polymorphism.
C. The ownerName variable breaks encapsulation.
D. The cardID and limit variables break polymorphism.
E. The setCardInformation method breaks encapsulation.
Answer: C

Q: 27Given:
11. class Animal { public String noise() { return "peep"; } }
12. class Dog extends Animal {
13. public String noise() { return "bark"; }
14. }
15. class Cat extends Animal {
16. public String noise() { return "meow"; }
17. }
...
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
Q: 28 Click the Task button.



Solution:
Dog is-a Animal
Forest has-a Tree
Rectangle has-a Side
JavaBook is-a ProgrammingBook

Q: 29 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 A only if the subclass is in the same
package as X.
Answer: B, E, F
Q: 30 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: C, D, E, G

Q: 31Given:
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: B, C, F

Q: 32 Click the Exhibit button.
What two must the programmer do to correct the compilation errors? (Choose two.)

```
 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. }
```

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: D, E

Q: 33 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
4
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

Q: 34 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: A, C, E, F, G

Q: 35 Given:
```
1. class Pizza {
2. java.util.ArrayList toppings;
3. public final void addTopping(String topping) {
4. toppings.add(topping);
5. }
6. }
7. public class PepperoniPizza extends Pizza {
8. public void addTopping(String topping) {
9. System.out.println("Cannot add Toppings");
10. }
11. public static void main(String[] args) {
12. Pizza pizza = new PepperoniPizza();
13. pizza.addTopping("Mushrooms");
14. }
15. }
```
What is the result?

Given:

```
10. public class Pizza {
11.   ArrayList toppings;
12.
13.   public final void addTopping(String
topping) {
14.     toppings.add(topping);
15.   }
16.
17.   public void removeTopping(String
topping) {
18.     toppings.remove(topping);
19.   }
20. }
```

And:

```
30. class PepperoniPizza extends Pizza {
31.  public void addTopping(String topping) {
32.    System.out.println("Cannot add
Toppings");
33.  }
34.
35.  public void removeTopping(String
topping) {
36.    System.out.println("Cannot remove
Pepperoni");
37.  }
38.}
```

And:

```
50. Pizza pizza = new PepperoniPizza();
51. pizza.addTopping("Mushrooms");
52. pizza.removeTopping("Pepperoni");
```

A. Compilation fails.
B. Cannot add Toppings
C. The code runs with no output.
D. A NullPointerException is thrown in Line 4.
Answer: A

Q: 36 Given:
1. interface DoStuff2 {
2. float getRange(int low, int high); }
3.
4. interface DoMore {
5. float getAvg(int a, int b, int c); }
6.
7. abstract class DoAbstract implements DoStuff2, DoMore { }
8.
9. class DoStuff implements DoStuff2 {
10. public float getRange(int x, int y) { return 3.14f; } }
11.
12. interface DoAll extends DoMore {
13. 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

Q: 37 Click the Exhibit button.
Given:
25. A a = new A();
26. System.out.println(a.doit(4, 5));
What is the result?

```
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. }
```

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

Q: 38 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

Q: 39 Given:
1. interface TestA { String toString(); }
2. public class Test {
3. public static void main(String[] args) {

```
4. System.out.println(new TestA() {
5. public String toString() { return "test"; }
6. });
7. }
8. }
```

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

Q: 40 Given:

```
11. public class ItemTest {
12. private final int id;
13. public ItemTest(int id) { this.id = id; }
14. public void updateId(int newId) { id = newId; }
15.
16. public static void main(String[] args) {
17. ItemTest fa = new ItemTest(42);
18. fa.updateId(69);
19. System.out.println(fa.id);
20. }
21. }
```

What is the result?

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

Answer: A

Q: 41 Given:

```
10. class One {
11. void foo() { }
12. }
13. class Two extends One {
14. //insert method here
15. }
```

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: B, C, E

Q: 42 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

Q: 43 Given:
11. public abstract class Shape {
12. int x;
13. int y;
14. public abstract void draw();
15. public void setAnchor(int x, int y) {
16. this.x = x;
17. this.y = y;
18. }
19. }
and a class Circle that extends and fully implements the Shape class.
Which is correct?
A. Shape s = new Shape();
s.setAnchor(10,10);
s.draw();
B. Circle c = new Shape();
c.setAnchor(10,10);
c.draw();
C. Shape s = new Circle();
s.setAnchor(10,10);
s.draw();
D. Shape s = new Circle();

s->setAnchor(10,10);
s->draw();
E. Circle c = new Circle();
c.Shape.setAnchor(10,10);
c.Shape.draw();
Answer: C

Q: 44 Click the Exhibit button.
What is the result?

```
11. class Person {
12.   String name = "No name";
13.   public Person(String nm) { name = nm; }
14. }
15.
16. 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

Q: 45 Given:
10. interface Foo {}
11. class Alpha implements Foo {}
12. class Beta extends Alpha {}
13. class Delta extends Beta {
14. public static void main(String[] args) {
15. Beta x = new Beta();
16. // insert code here

17. }
18. }
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

Q: 46 Given:
1. class SuperClass {
2. public A getA() {
3. return new A();
4. }
5. }
6. class SubClass extends SuperClass {
7. public B getA(){
8. return new B();
9. }
10. }
Which statement is true?
A. Compilation will succeed if A extends B.
B. Compilation will succeed if B extends A.
C. Compilation will always fail because of an error in line 7.
D. Compilation will always fail because of an error in line 8.

Answer: B

Q: 47 Given:
11. static class A {
12. void process() throws Exception { throw new Exception(); }
13. }
14. static class B extends A {
15. void process() { System.out.println("B"); }
16. }
17. public static void main(String[] args) {
18. new B().process();
19. }
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

Q: 48 Given:
11. class ClassA {}
12. class ClassB extends ClassA {}
13. class ClassC extends ClassA {}

and:
21. ClassA p0 = new ClassA();
22. ClassB p1 = new ClassB();
23. ClassC p2 = new ClassC();
24. ClassA p3 = new ClassB();
25. 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: A, E, F

Q: 49 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()
25. + ", " + 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

Q: 50 Given code in separate source files:

10. public class Foo {
11. public int a;
12. public Foo() { a = 3; }
13. public void addFive() { a += 5;}
14. } and: 20. public class Bar extends Foo {
21. public int a;
22. public Bar() { a = 8; }
23. public void addFive() { this.a += 5; }
24. } invoked with:
30. Foo foo = new Bar();
31. foo.addFive();
32. System.out.println("Value: " + foo.a);
What is the result?

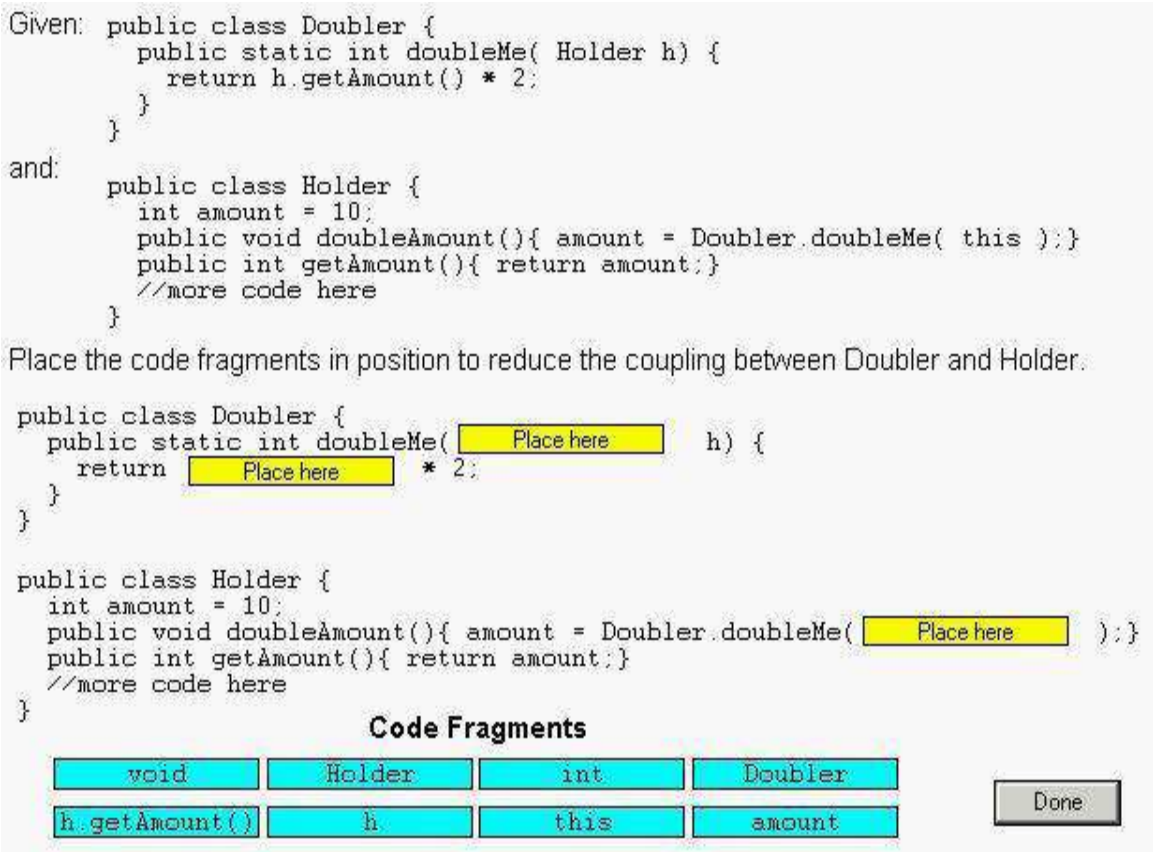
A. Value: 3
B. Value: 8
C. Value: 13
D. Compilation fails.
E. The code runs with no output.
F. An exception is thrown at runtime.
Answer: A

Q: 51 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

Q: 52 Given:
10. interface Foo { int bar(); }
11. public class Sprite {
12. public int fubar(Foo foo) { return foo.bar(); }
13. public void testFoo() {
14. fubar(
15. // insert code here
16.);
17. }
18. }

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

Q: 53 Click the Task button.



Solution:

1. int 2. h 3. amount.

Q: 54 Given classes defined in two different files:

1. package packageA;
2. public class Message {
3. String getText() { return "text"; }
4. }
and:
1. package packageB;
2. public class XMLMessage extends packageA.Message {
3. String getText() { return "<msg>text</msg>";}
4. public static void main(String[] args) {
5. System.out.println(new XMLMessage().getText());
6. }
7. }
What is the result of executing XMLMessage.main?
A. text
B. An exception is thrown at runtime.
C. Compilation fails because of an error in line 2 of XMLMessage.
D. Compilation fails because of an error in line 3 of XMLMessage.

Answer: D

Q: 55 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: 56
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() { System.out.println("go in Sente."); }
11. }
12.
13. class Goban extends Sente {
14. public void go() { System.out.println("go in Goban"); }
15. }
16.
17. class Stone extends Goban implements Go { }
18.
19. 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: 57
Click the Exhibit button.

```
1. public class Employee {
2. String name;
3. double baseSalary;
4. Employee(String name, double baseSalary) {
5. this.name = name;
6. this.baseSalary = baseSalary;
7. }
8. }
```

And:

```
1. public class Salesperson extends Employee {
2. double commission;
3. public Salesperson(String name, double baseSalary,
4. double commission) {
5. // insert code here
6. }
7. }
```

Which code, inserted at line 7, completes the Salesperson constructor?
A. this.commission = commission;
B. superb();
commission = commission;
C. this.commission = commission;
superb();
D. super(name, baseSalary);
this.commission = commission;
E. super();
this.commission = commission;
F. this.commission = commission;
super(name, baseSalary);

Answer: D

Question: 58
Given:

```
1. public class Team extends java.util.LinkedList {
2. public void addPlayer(Player p) {
3. add(p);
```

```
4. }
5. public void compete(Team opponent) { /* more code here */ }
6. }
7. class Player { /* more code here */ }
```

Which two are true? (Choose two.)
A. This code will compile.
B. This code demonstrates proper design of an is-a relationship.
C. This code demonstrates proper design of a has-a relationship.
D. A Java programmer using the Team class could remove Player objects from a Team object.
Answer: AD

Question: 59
Given:

```
5. class Atom {
6. Atom() { System.out.print("atom "); }
7. }
8. class Rock extends Atom {
9. Rock(String type) { System.out.print(type); }
10. }
11. public class Mountain extends Rock {
12. Mountain() {
13. super("granite ");
14. new Rock("granite ");
15. }
16. public static void main(String[] a) { new Mountain(); }
17. }
```

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: 60
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: 61
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 urchased 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: B,C

Question: 62
Given:
31. class Foo {
32. public int a = 3;
33. public void addFive() { a += 5; System.out.print("f "); }
34. }
35. class Bar extends Foo {
36. public int a = 8;
37. public void addFive() { this.a += 5; System.out.print("b "); }
38. }
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: 63
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: 64
Given:
5. class Thingy { Meter m = new Meter(); }
6. class Component { void go() { System.out.print("c"); } }
7. class Meter extends Component { void go() { System.out.print("m"); } }
8.
9. class DeluxeThingy extends Thingy {
10. public static void main(String[] args) {
11. DeluxeThingy dt = new DeluxeThingy();
12. dt.m.go();
13. Thingy t = new DeluxeThingy();
14. t.m.go();
15. }
16. }
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: A,F

Question: 65
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: 66
Given:
```
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: A,B,E,F

Question: 67
Given:
11. public interface A { public void m1(); }
12.
13. class B implements A { }
14. class C implements A { public void m1() { } }
15. class D implements A { public void m1(int x) { } }
16. abstract class E implements A { }
17. abstract class F implements A { public void m1() { } }
18. 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: 68
Given:
3. interface Fish { }
4. class Perch implements Fish { }
5. class Walleye extends Perch { }
6. class Bluegill { }
7. public class Fisherman {
8. public static void main(String[] args) {
9. Fish f = new Walleye();
10. Walleye w = new Walleye();
11. Bluegill b = new Bluegill();
12. if(f instanceof Perch) System.out.print("f-p ");
13. if(w instanceof Fish) System.out.print("w-f ");
14. if(b instanceof Fish) System.out.print("b-f ");
15. }
16. }
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: 69
11. public interface A111 {
12. String s = "yo";
13. public void method1();
14. }
17. interface B { }
20. interface C extends A111, B {
21. public void method1();
22. public void method1(int x);
23. } 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: 70
10. import java.io.*;
11. class Animal {
12. Animal() { System.out.print("a"); }
13. }
14. class Dog extends Animal implements Serializable {
15. Dog() { System.out.print("d"); }
16. }
17. 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: 71
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: 72
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: A,C

Question: 73
```
11. class Alpha {
12. public void foo() { System.out.print("Afoo "); }
13. }
14. public class Beta extends Alpha {
15. public void foo() { System.out.print("Bfoo "); }
16. public static void main(String[] args) {
17. Alpha a = new Beta();
18. Beta b = (Beta)a;
19. a.foo(); 20. b.foo();
21. }
22. }
```
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: 74
Click the Exhibit button.
```
11. class Payload {
12. private int weight;
13. public Payload(int wt) { weight = wt; }
13. public void setWeight(mt w) { weight = w; }
15. public String toString { return Integer.toString(weight); }
16. }
17.
18. public class TestPayload {
19. static void changePayload(Payload p) {
20. /* insert code here */
21. }
```

22.
23. public static void main(String[] args) {
24. Payload p = new Payload();
25. p.setWeight(1024);
26. changePayload(p);
27. System.out.println("The value of p is "+ p);
28. }
29. }
Which statement, placed at line 20, causes the code to print "The value of 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);
F. p = new Payload();
p.setWeight(420);
Answer: A

.

9. Multi-Threading

Q: 01 Click the Exhibit button.
What is the result?

```
 1.  class Computation extends Thread {
 2.
 3.    private int num;
 4.    private boolean isComplete;
 5.    private int result;
 6.
 7.    public Computation(int num) { this.num
= num; }
 8.
 9.    public synchronized void run() {
10.      result = num * 2;
11.      isComplete = true;
12.      notify();
13.    }
14.
15.    public synchronized int getResult() {
16.      while (!isComplete) {
17.        try {
18.          wait();
19.        } catch (InterruptedException e)
{}
20.      }
21.      return result;
22.    }
23.
24.    public static void main(String[] args)
{
25.      Computation[] computations = new
Computation[4];
26.      for (int i = 0; i <
computations.length; i++) {
27.        computations[i] = new
Computation(i);
28.        computations[i].start();
29.      }
30.      for (Computation c : computations)
31.        System.out.print(c.getResult() + "
");
32.    }
33.  }
```

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

Q: 02 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: D, E

Q: 03 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

Q: 04 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

Q: 05 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: A, C, E

Q: 06 Given:
7. void waitForSignal() {
8. Object obj = new Object();
9. synchronized (Thread.currentThread()) {
10. obj.wait();
11. obj.notify();
12. }
13. }
Which statement is true?
A. This code may throw an InterruptedException.
B. This code may throw an IllegalStateException.
C. This code may throw a TimeoutException after ten minutes.
D. This code will not compile unless "obj.wait()" is replaced with "((Thread) obj).wait()".
E. Reversing the order of obj.wait() and obj.notify() may cause this method to complete normally.
F. A call to notify()or notifyAll() from another thread may cause this method to complete normally.
Answer: B

Q: 07 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: D, F

Q: 08 Given:
1. public class TestOne implements Runnable {
2. public static void main (String[] args) throws Exception {
3. Thread t = new Thread(new TestOne());
4. t.start();
5. System.out.print("Started");
6. t.join();
7. System.out.print("Complete");
8. }
9. public void run() {
10. for (int i = 0; i < 4; i++) {

11. System.out.print(i);
12. }
13. }
14. }
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

Q: 09Given:
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

Q: 10 Given:
11. public class Test {
12. public enum Dogs {collie, harrier, shepherd};
13. public static void main(String [] args) {
14. Dogs myDog = Dogs.shepherd;
15. switch (myDog) {
16. case collie:

```
17. System.out.print("collie ");
18. case default:
19. System.out.print("retriever ");
20. case harrier:
21. System.out.print("harrier ");
22. }
23. }
24. }
```

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

Q: 11 Given:

```
11. Runnable r = new Runnable() {
12. public void run() {
13. System.out.print("Cat");
14. }
15. };
16. Thread t = new Thread(r) {
17. public void run() {
18. System.out.print("Dog");
19. }
20. };
21. 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

Q: 12 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

Q: 13 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. } }
```

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: A, D

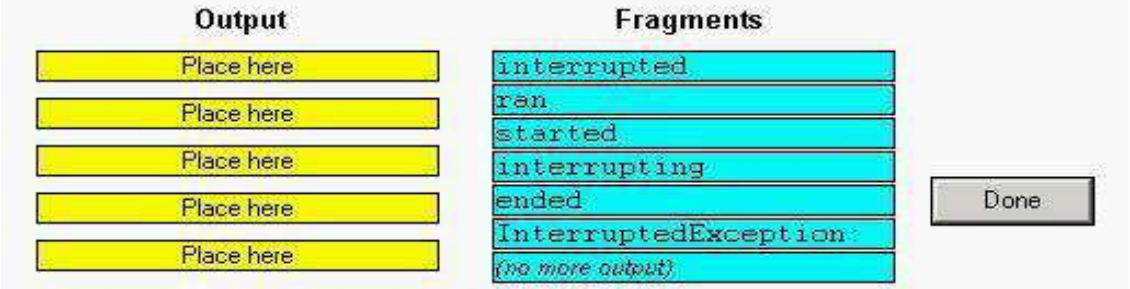
Q: 14 Click the Task button.

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.



Solution:
1.started
2.ran
3.interrupting
4.ended
5.(no more out put)

15 Click the Exhibit button.

What is the output if the main() method is run?

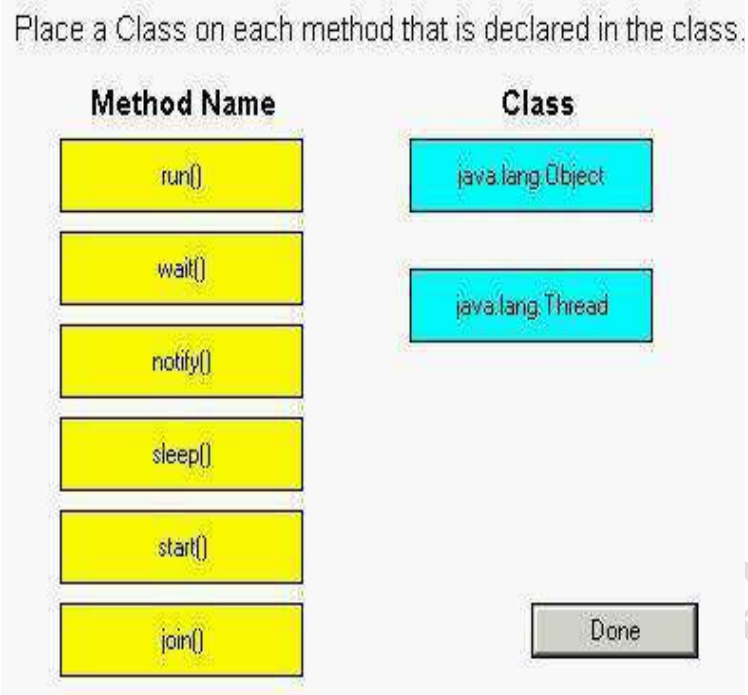
Given:

```
10.  public class Starter extends Thread {
11.    private int x = 2;
12.    public static void main(String[] args)
throws Exception {
13.      new Starter().makeItSo();
14.    }
15.    public Starter() {
16.      x = 5;
17.      start();
18.    }
19.    public void makeItSo() throws
Exception {
20.      join();
21.      x = x - 1;
22.      System.out.println(x);
23.    }
24.    public void run() { x *= 2; }
25.  }
```

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

Q: 16 Click the Task button.



Solution:
java.lang.object ---------- wait( ); notify( );
java.lang.Thread----------run(), sleep( ); start( ); join ( )

Q: 17 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

Q: 18 Given:
1. public class MyLogger {
2. private StringBuilder logger = new StringBuuilder();
3. public void log(String message, String user) {
4. logger.append(message);
5. logger.append(user);
6. }
7. }

The programmer must guarantee that a single MyLogger object works properly for a multi-threaded system.
How must this code be changed to be thread-safe?
A. synchronize the log method
B. replace StringBuilder with StringBuffer
C. replace StringBuilder with just a String object and use the string concatenation (+=) within the log method
D. No change is necessary, the current MyLogger code is already thread-safe.

Answer: A

Q: 19 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

Q:20 Click the Exhibit button.
Which two statements are true if this class is compiled and run? (Choose two.)

```
1.  import java.util.*;
2.
3.  public class NameList {
4.    private List names = new ArrayList();
5.    public synchronized void add(String
name) { names.add(name); }
6.    public synchronized void printAll() {
7.      for (int i = 0; i < names.size();
i++) {
8.        System.out.print(names.get(i) + "
");
9.      }
10.   }
11.   public static void main(String[] args)
{
12.     final NameList sl = new NameList();
13.     for (int i = 0; i < 2; i++) {
14.       new Thread() {
15.         public void run() {
16.           sl.add("A");
17.           sl.add("B");
18.           sl.add("C");
19.           sl.printAll();
20.         }
21.       }.start();
22.     }
23.   }
24. }
```

A. An exception may be thrown at runtime.
B. The code may run with no output, without exiting.
C. The code may run with no output, exiting normally.
D. The code may run with output "A B A B C C ", then exit.
E. The code may run with output "A B C A B C A B C ", then exit.
F. The code may run with output "A A A B C A B C C ", then exit.
G. The code may run with output "A B C A A B C A B C ", then exit.

Answer: E, G

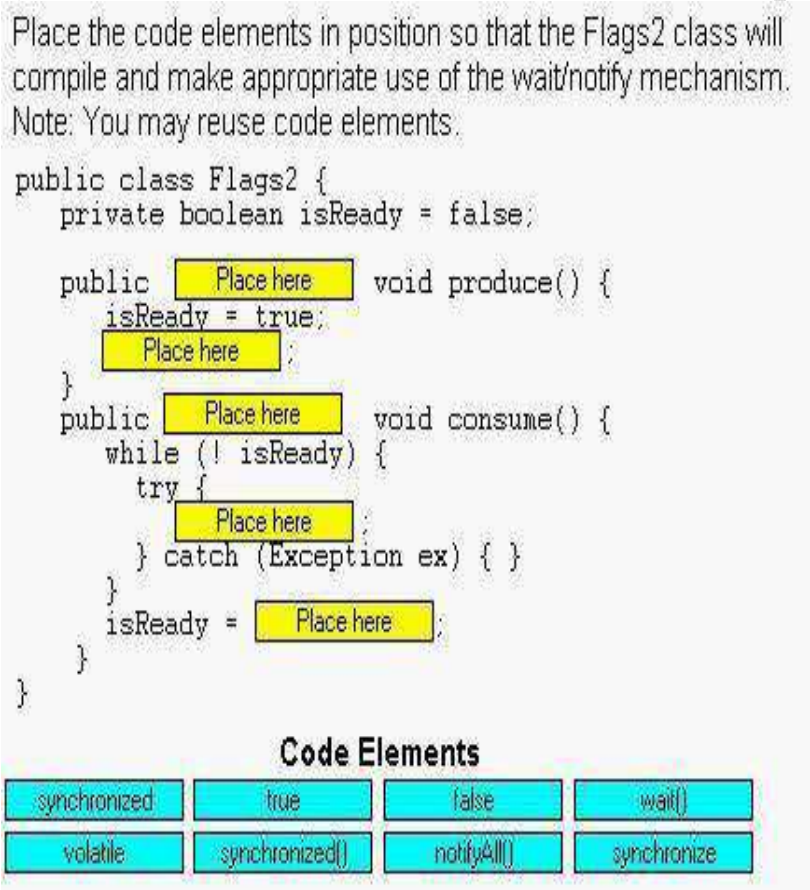
Q: 21 Given:
1. public class Threads5 {
2. public static void main (String[] args) {
3. new Thread(new Runnable() {
4. public void run() {
5. System.out.print("bar");
6. }}).start();
7. }
8. }

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

Q: 22 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: C, E, F

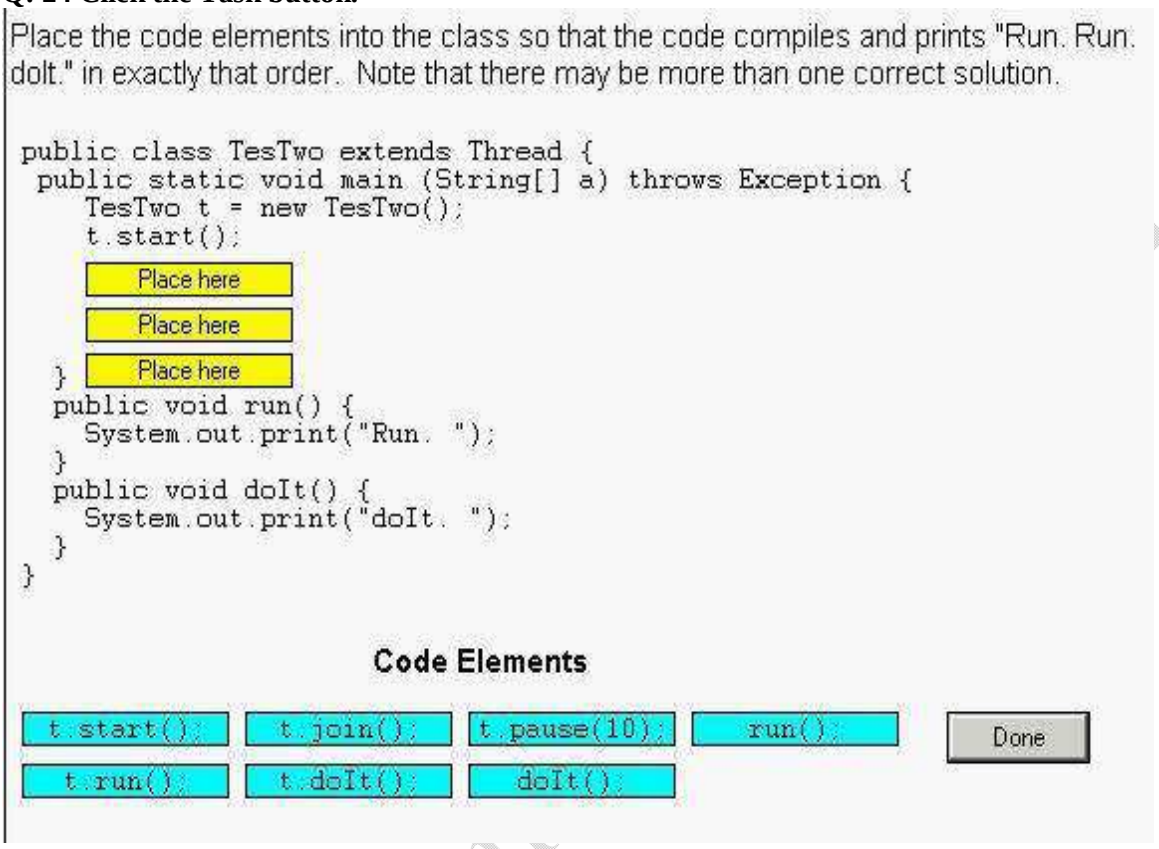
Q: 23 Click the Task button.



Solution:
1.synchronized
2.notifyAll( )
3.synchronized

4.wait( )
5.false

Q: 24 Click the Task button.



Solution:

t.join( );
t.run( );
t.doIt( );

Q: 25 Click the Exhibit button.
Which two are possible results? (Choose two.)

```
 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.print(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.}
```

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: A, C

Question: 26
Click the Exhibit button.
Given:
1**. public class TwoThreads {**
2
3. private static Object resource = new Object();
4.
5. private static void delay(long n) {
6. try { Thread.sleep(n); }
7. catch (Exception e) { System.out.print("Error "); }

```
8. }
9
10. public static void main(String[] args) {
11. System.out.print("StartMain ");
12. new Thread1().start();
13. delay(1000);
14. Thread t2 = new Thread2();
15. t2.start();
16. delay(1000);
17. t2.interrupt
18. delay(1000);
19. System.out.print("EndMain ");
20. }
21.
22. static class Thread 1 extends Thread {
23. public void run() {
24. synchronized (resource) {
25. System.out.print("Startl ");
26. delay(6000);
27. System.out.print("End1 ");
28. }
29. }
30. }
31.
32. static class Thread2 extends Thread {
33. public void run() {
34. synchronized (resource) {
35. System.out.print("Start2 ");
36. delay(2000);
37. System.out.print("End2 ");
38. }
39. }
40. }
41. }
```

Assume that sleep(n) executes in exactly m milliseconds, and all other code executes in an insignificant amount of time. What is the output if the main() method is run?

A. Compilation fails.
B. Deadlock occurs.
C. StartMain Start1 Error EndMain End1
D. StartMain Start1 EndMain End1 Start2 End2
E. StartMain Start1 Error Start2 EndMain End2 End1
F. StartMain Start1 Start2 Error End2 EndMain End1
G. StartMain Start1 EndMain End1 Start2 Error End2

Answer: G

Question: 27
Click the Exhibit button.

```
10. public class Transfers {
11. public static void main(String[] args) throws Exception {
12. Record r1 = new Record();
13. Record r2 = new Record();
14. doTransfer(r1, r2, 5);
15. doTransfer(r2, r1, 2);
16. doTransfer(r1, r2, 1);
17. // print the result
18. System.out.println("rl = " + r1.get() +", r2=" + r2.get());
19. }
20. private static void doTransfer(
21. final Record a, final Record b, final int amount) {
22. Thread t = new Thread() {
23. public void run() {
24. new Clerk().transfer(a, b, amount);
25. }
26. };
27. t.start();
28. }
29. }
30. class Clerk {
31. public synchronized void transfer(Record a, Record b, int amount){
32. synchronized (a) {
33. synchronized (b) {
34. a.add(-amount);
35. b.add(amount);
36. }
37. }
38. }
39. }
40. class Record {
41.int num=10;
42. public int get() { return num; }
43. public void add(int n) { num = num + n; }
44. }
```

If Transfers.main() is run, which three are true? (Choose three.)
A. The output may be "r1 = 6, r2 = 14".
B. The output may be "r1 = *5*, r2 = *15*".

C. The output may be "r1 = 8, r2 = 12".
D. The code may run (and complete) with no output.
E. The code may deadlock (without completing) with no output.
F. M IllegalStateException or InterruptedException may be thrown at runtime.
Answer: ABE

Question: 28
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: A, F

Question: 29
Given:

```
11. class PingPong2 {
12. synchronized void hit(long n) {
13. for(int i = 1; i < 3; i++)
14. System.out.print(n + "-" + i + " ");
15. }
16. }
17. public class Tester implements Runnable {
18. static PingPong2 pp2 = new PingPong2();
19. public static void main(String[] args) {
20. new Thread(new Tester()).start();
21. new Thread(new Tester()).start();
22. }
23. public void run() { pp2.hit(Thread.currentThread().getId()); }
24. }
```

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: 30
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: 31
Given that Triangle implements Runnable, and:

```
31. void go() throws Exception {
32. Thread t = new Thread(new Triangle());
33. t.start();
34. for(int x = 1; x < 100000; x++) {
35. //insert code here
36. if(x%100 == 0) System.out.print("g");
37. } }
38. public void run() {
39. try {
40. for(int x = 1; x < 100000; x++) {
41. // insert the same code here
42. if(x%100 == 0) System.out.print("t");
43. }
44. } catch (Exception e) { }
45. }
```

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: C,D

10. Java.lang Package

Q:01 Given:

```
11. public class Person {
12. private String name, comment;
13. private int age;
14. public Person(String n, int a, String c) {
15. name = n; age = a; comment = c;
16. }
17. public boolean equals(Object o) {
18. if (! (o instanceof Person)) return false;
19, Person p = (Person)o;
20. return age == p.age && name.equals(p.name);
21. }
22. }
```

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

Q: 02 Given this method in a class:

```
21. public String toString() {
22. StringBuffer buffer = new StringBuffer();
23. buffer.append('<');
24. buffer.append(this.name);
25. buffer.append('>');
26. return buffer.toString();
27. }
```

Which statement is true?
A. This code is NOT thread-safe.
B. The programmer can replace StringBuffer with StringBuilder with no other changes.
C. This code will perform poorly. For better performance, the code should be rewritten:
return "<" + this.name + ">";
D. This code will perform well and converting the code to use StringBuilder will not enhance the performance.
Answer: B

Q: 03 Given:

```
11. public void testIfA() {
12. if (testIfB("True")) {
13. System.out.println("True");
14. } else {
15. System.out.println("Not true");
16. }
```

```
17. }
18. public Boolean testIfB(String str) {
19. return Boolean.valueOf(str);
20. }
```

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

Q: 04 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

Q: 05 Given:

```
1. public class TestString3 {
2. public static void main(String[] args) {
3. // insert code here
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");
s.delete(0,3).replace(1,3,"24").delete(4,6);
C. StringBuffer s = new StringBuffer("123456789");

s.substring(3,6).delete(1,3).insert(1, "24");
D. StringBuilder s = new StringBuilder("123456789");
s.substring(3,6).delete(1,2).insert(1, "24");
E. StringBuilder s = new StringBuilder("123456789");
s.delete(0,3).delete(1,3).delete(2,5).insert(1, "24");
Answer: B, E

Q: 06 Given:

```
11. public static void test(String str) {
12. int check = 4;
13. if (check = str.length()) {
14. System.out.print(str.charAt(check -= 1) +", ");
15. } else {
16. System.out.print(str.charAt(0) + ", ");
17. }
18. }
```

and the invocation:

```
21. test("four");
22. test("tee");
23. 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

Q: 07 Given:

```
11. public class Person {
12. private String name;
13. public Person(String name) {
14. this.name = name;
15. }
16. public boolean equals(Object o) {
17. if ( ! o instanceof Person ) return false;
18. Person p = (Person) o;
19. return p.name.equals(this.name);
20. }
```

21. }
Which statement is true?

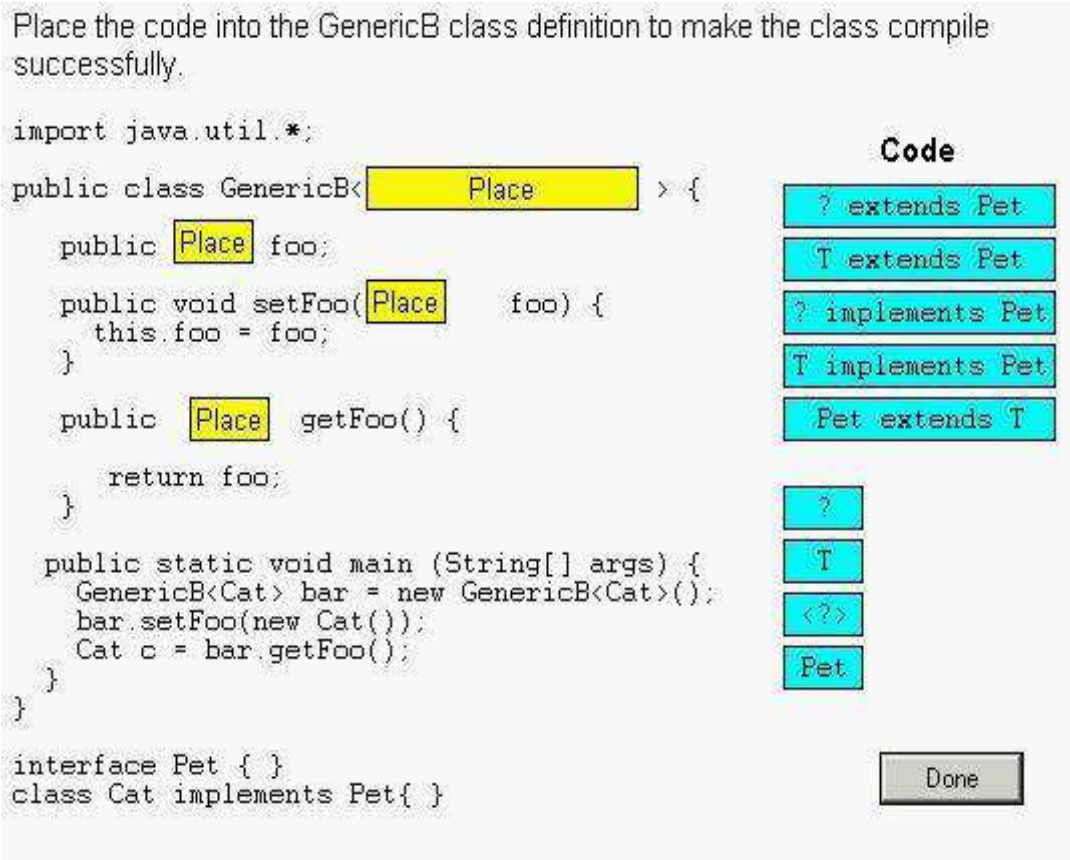
A. Compilation fails because the hashCode method is not overridden.
B. A HashSet could contain multiple Person objects with the same name.
C. All Person objects will have the same hash code because the hashCode method is not overridden.
D. If a HashSet contains more than one Person object with name="Fred",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

Answer: B

Q: 08 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: C, E

Q: 09 Click the Task button.



1.<T extends Pet>
2. T
3.T
4.T
Q: 10 Given:
10. public class MyClass {
11.
12. public Integer startingI;
13. public void methodA() {
14. Integer i = new Integer(25);
15. startingI = i;
16. methodB(i);
17. }
18. private void methodB(Integer i2) {
19. i2 = i2.intValue();
20.
21. }
22. }
If methodA is invoked, which two are true at line 20? (Choose two.)
A. i2 == startingI returns true.

B. i2 == startingI returns false.
C. i2.equals(startingI) returns true.
D. i2.equals(startingI) returns false.
Answer: B, C
Question: 11
Given:
11. public String makinStrings() {
12. String s = "Fred";
13. s = s + "47";
14. s = s.substring(2, 5);
15. s = s.toUpperCase();
16. return s.toString();
17. }
How many String objects will be created when this method is invoked?
A. 1 B. 2
C. 3 D. 4
E. 5 F. 6
Answer: E

Q: 12 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

Q: 13 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

Q: 14 Given:

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

Q: 15 Given:

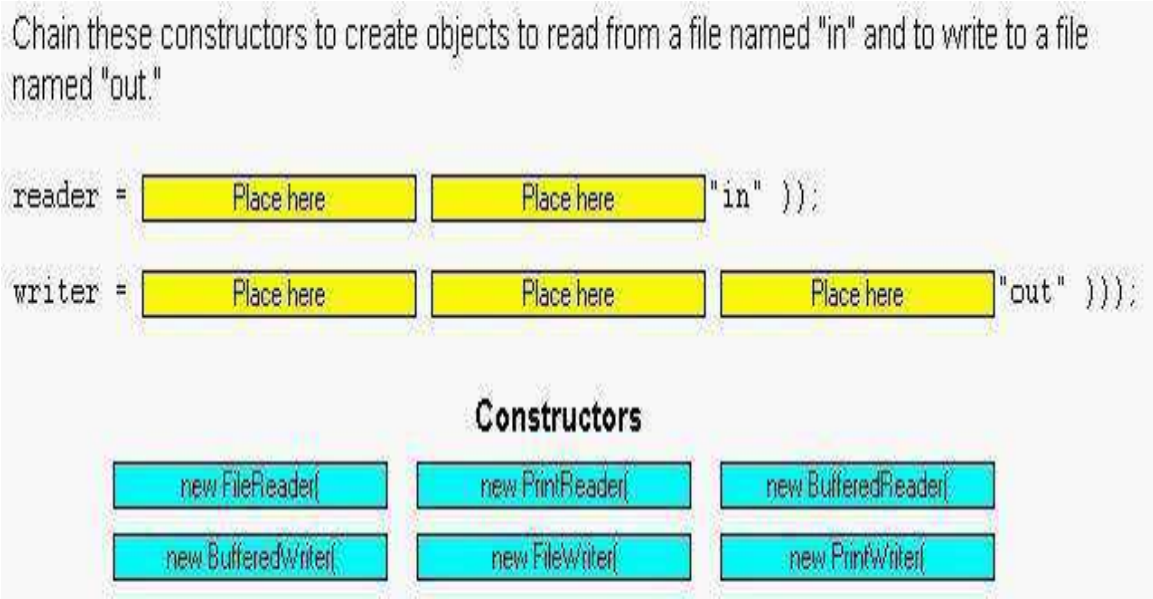
Which two scenarios are NOT safe to replace a StringBuffer object with a StringBuilder object? (Choose two.)

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: A,B

11. java.io package and Serialization

Q: 01 Click the Task button.



Solution:
reader = new BufferedReader(new FileReader("in");
writer = new PrintWriter (new BufferedWriter (new FileWriter("out")));

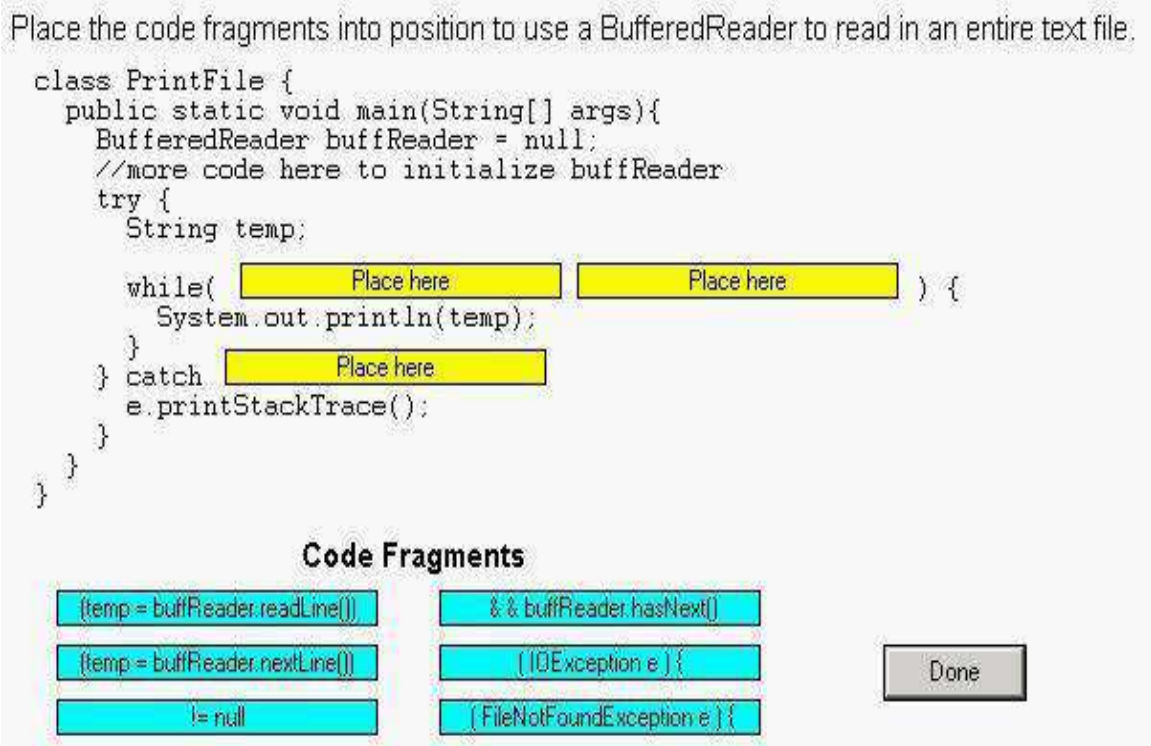
Q: 02 Given:

```
12. import java.io.*;
13. public class Forest implements Serializable {
14. private Tree tree = new Tree();
15. public static void main(String [] args) {
16. Forest f = new Forest();
17. try {
18. FileOutputStream fs = new FileOutputStream("Forest.ser");
19. ObjectOutputStream os = new ObjectOutputStream(fs);
20. os.writeObject(f); os.close();
21. } catch (Exception ex) { ex.printStackTrace(); }
22. } }
23.
24. 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

Q: 03 Click the Task button.



Solution:

1. **(temp = buffReader.readLine())**
2. **!= null**
3. **(IOException e){**

Q: 04 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

Q: 05 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: B, D, E

Q: 06 Assuming that the serializeBanana2() and the deserializeBanana2() methods will correctly use Java serialization and given:

```
13. import java.io.*;
14. class Food {Food() { System.out.print("1"); } }
15. class Fruit extends Food implements Serializable {
16. Fruit() { System.out.print("2"); } }
17. public class Banana2 extends Fruit { int size = 42;
18. public static void main(String [] args) {
19. Banana2 b = new Banana2();
20. b.serializeBanana2(b); // assume correct serialization
21. b = b.deserializeBanana2(b); // assume correct
22. System.out.println(" restored " + b.size + " "); }
23. // more Banana2 methods
24. }
```

What is the result?
A. Compilation fails.
B. 1 restored 42
C. 12 restored 42
D. 121 restored 42
E. 1212 restored 42
F. An exception is thrown at runtime.
Answer: D

Q: 7 When comparing java.io.BufferedWriter to java.io.FileWriter, which capability exists as a method in only one of the two?
A. closing the stream
B. flushing the stream
C. writing to the stream
D. marking a location in the stream
E. writing a line separator to the stream
Answer: E

Question: 8
Given:

```
10. class MakeFile {
11. public static void main(String[] args) {
12. try {
13. File directory = new File("d");
```

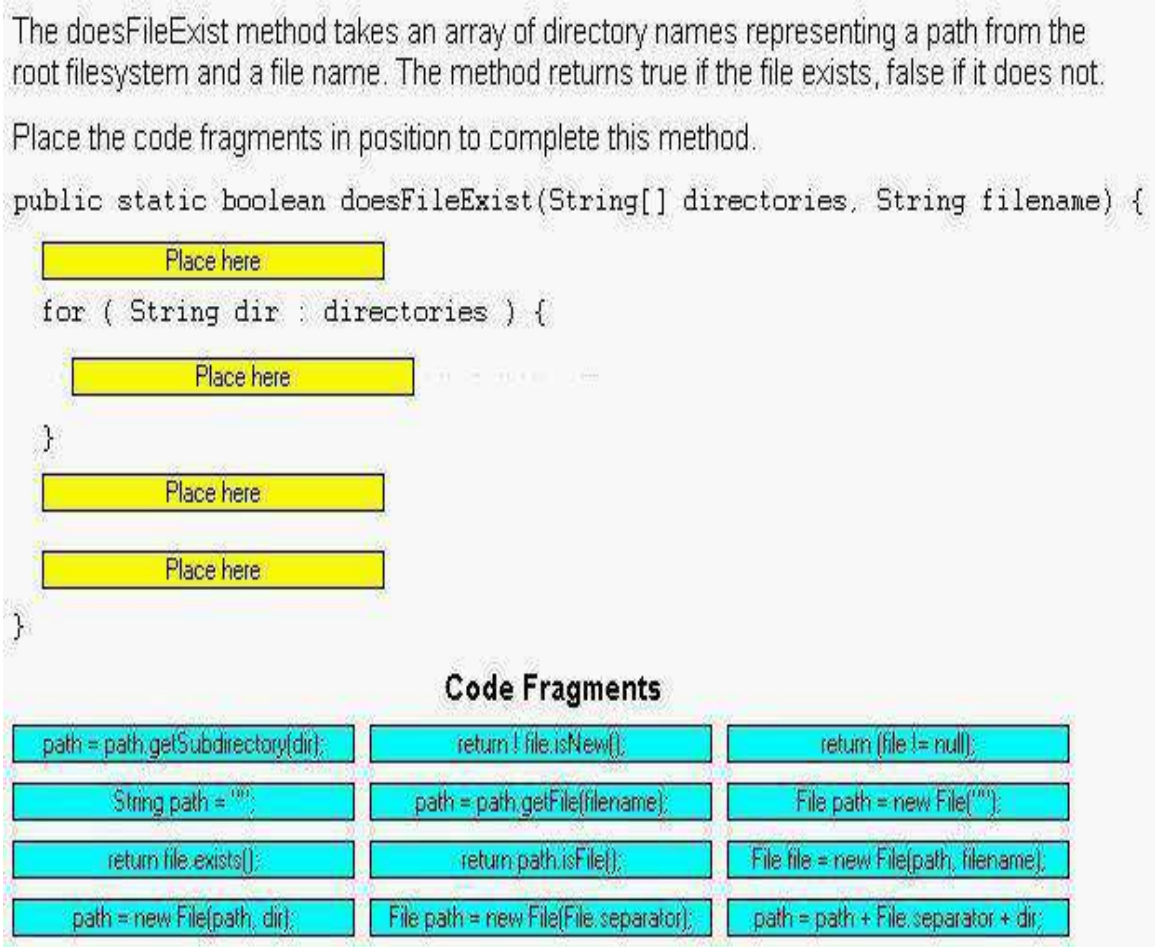
```
14. File file = new File(directory,"f");
15. if(!file.exists()) {
16. file.createNewFile();
17. }
18. } catch (IOException e) {
19. e.printStackTrace
20. }
21. }
22. }
```

The current directory does NOT contain a directory named "d."
Which three are true? (Choose three.)

A. Line 16 is never executed.
B. An exception is thrown at runtime.
C. Line 13 creates a File object named "d."
D. Line 14 creates a File object named "f.'
E. Line 13 creates a directory named "d" in the file system.
F. Line 16 creates a directory named "d" and a file 'f' within it in the file system.
G. Line 14 creates a file named 'f' inside of the directory named "d" in the file system.

Answer: BCD

Q: 09 Click the Task button.



Solution:
1. String path=" ";
2. path=path+File.separator+dir;
3. File file=new File(path,filename);
4. return file.exists();

Q:10 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 ) { this.x =
x; this.y = y; }
 5.
 6.    private void writeObject(
ObjectOutputStream s )
 7.          throws IOException {
 8.       s.writeInt(x); s.writeInt(y) ;
 9.    }
10.
11.    private void readObject(
ObjectInputStream s )
12.          throws IOException,
ClassNotFoundException {
13.
14.       // insert code here
15.
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

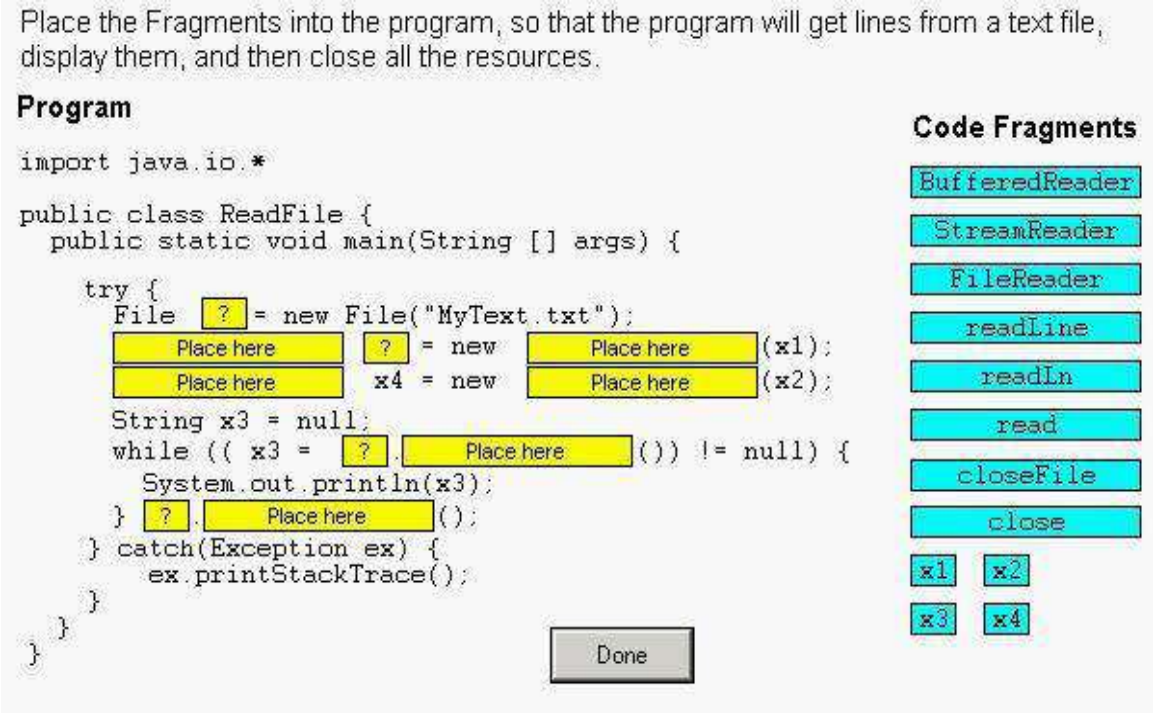
Question: 11
Given:

10. public class Foo implements java.io.Serializable {
11. private int x;
12. public int getX() { return x; }
12.publicFoo(int x){this.x=x; }
13. private void writeObject(ObjectOutputStream s)
14. throws IOException {
***15.* // insert code here**
16. }
17. }
Which code fragment, inserted at line *15*, will allow Foo objects to be correctly serialized and deserialized?
A. s.writeInt(x);
B. s.serialize(x);
C. s.writeObject(x);

D. s.defaultWriteObject();

Answer: D

12 Click the Task button.



Solution:

```
import java.io.*;
        public class ReadFile{
         public static void main(String s[ ]){
              try {
                  File x1=new File("MyText.txt");
                  FileReader x2=new FileReader(x1);
                  BufferedReader x4=new BufferedReader(x2);
                  String s3=null;
                 while((x3 = x4.readLine( )) != null )  {
                  System.out.println(x3);
                  }x4.close( );
                }catch(Exception e){
                  e.printStackTrace();
                  }
        }
}
```

Question: 13

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: 14
Given that the current directory is empty, and that the user has read and write permissions, and the following:
11. import java.io.*;
12. public class DOS {
13. public static void main(String[] args) {
14. File dir = new File("dir");
15. dir.mkdir();
16. File f1 = new File(dir, "f1.txt");
17. try {
18. f1.createNewFile();
19. } catch (IOException e) { ; }
20. File newDir = new File("newDir");
21. dir.renameTo(newDir);
22. }
23. }
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: 15
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: 16
Given:
5. import java.io.*;
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: 17
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: 18
Given:
12. String csv = "Sue,5,true,3";
13. Scanner scanner = new Scanner(csv);

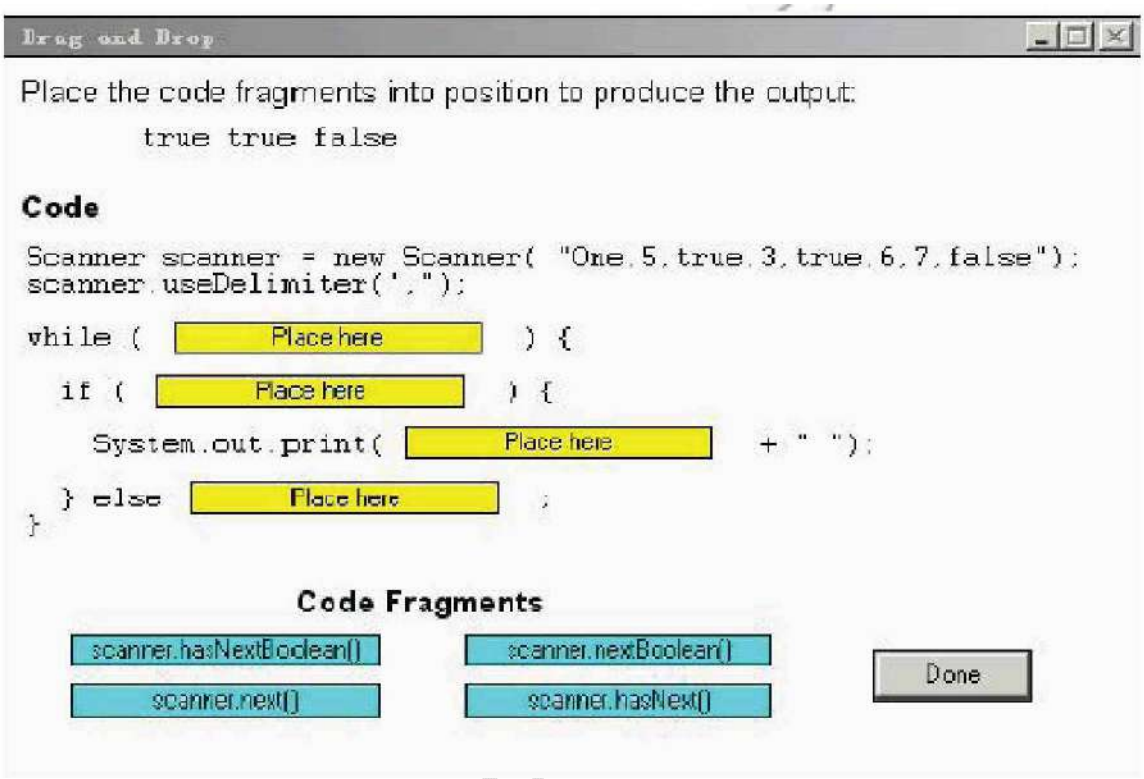
14. scanner.useDelimiter(",");
15. int age = scanner.nextInt();
What is the result?
A. Compilation fails.
B. After line 15, the value of age is 5.
C. After line 15, the value of age is 3.
D. An exception is thrown at runtime.
Answer: D

Question: 19
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: A,E

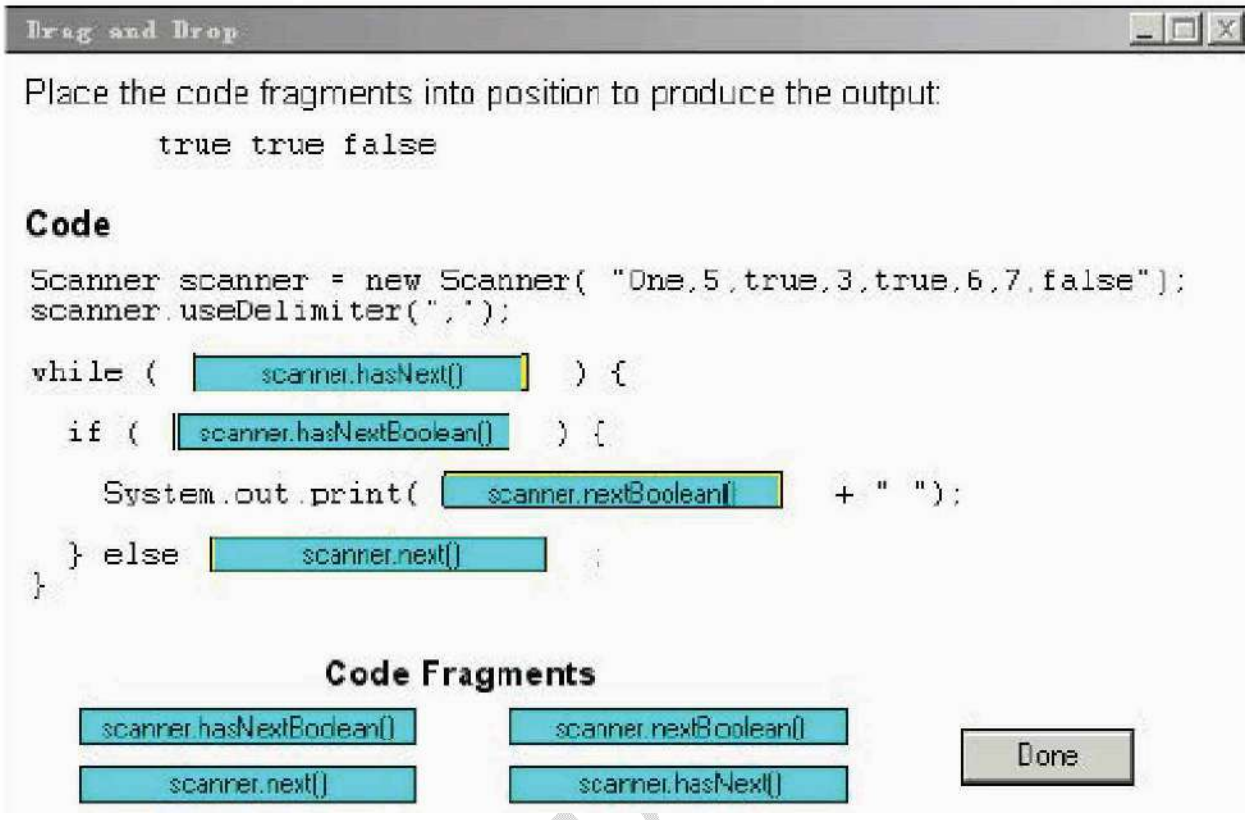
Question: 20
Given that c is a reference to a valid java.io.Console object, and:
11. String pw = c.readPassword("%s", "pw: ");
12. System.out.println("got " + pw);
13. String name = c.readLine("%s", "name: ");
14. System.out.println(" got ", name);
If the user types fido when prompted for a password, 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: 21
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: 22
Click the Task button.



Answer:


Drag and Drop
Place the code fragments into position to produce the output:
true true false
Code
Scanner scanner = new Scanner("One,5,true,3,true,6,7,false");
scanner.useDelimiter(",");
while (scanner.hasNext()) {
if (scanner.hasNextBoolean()) {
System.out.print(scanner.nextBoolean() + " ");
} else scanner.next()
}
Code Fragments
scanner.hasNextBoolean()
scanner.nextBoolean()
scanner.next()
scanner.hasNext()
Done

12. Collections and Generics

Q: 01 Given:
34. HashMap props = new HashMap();
35. props.put("key45", "some value");
36. props.put("key12", "some other value");
37. props.put("key39", "yet another value");
38. Set s = props.keySet();
39. // 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

Q: 02 Click the Exhibit button.
Which statement is true about the set variable on line 12?

```
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. }
```

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

Q: 03 Given:

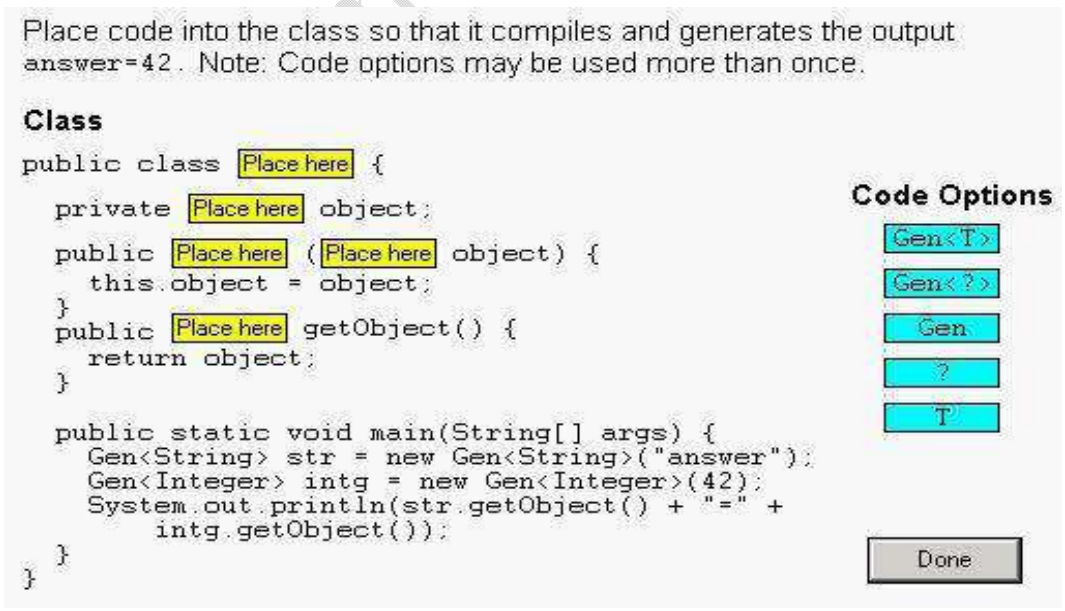
```
23. Object [] myObjects = {
24. new Integer(12),
25. new String("foo"),
26. new Integer(5),
27. new Boolean(true)
28. };
29. Arrays.sort(myObjects);
30. for(int i=0; i<myObjects.length; i++) {
31. System.out.print(myObjects[i].toString());
32. System.out.print(" ");
33. }
```

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

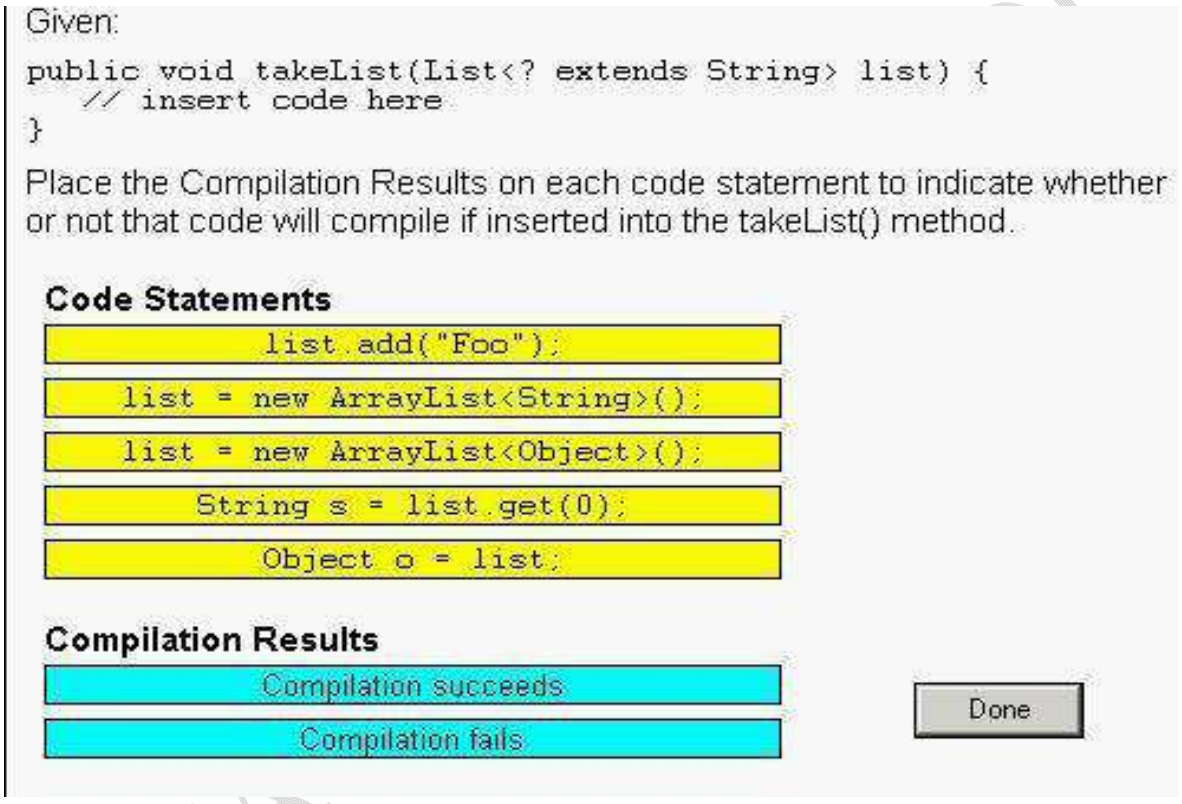
Q: 04 Click the Task button.



Solution:

1.Gen<T>
2.T
3.Gen
4.T
5.T

Q: 05 Click the Task button.



Solution:
1. list.add("foo"); ---------- Compilation fails
2. list = new ArrayList<String>(); ------Compilation succeeds
3.list=new ArrayList<Object>( ); ---- Compilation fails
4. String s = list.get(0); ------ Compilation succeeds
5. Object o = list; ----- Compilation succeeds

Q: 06 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.

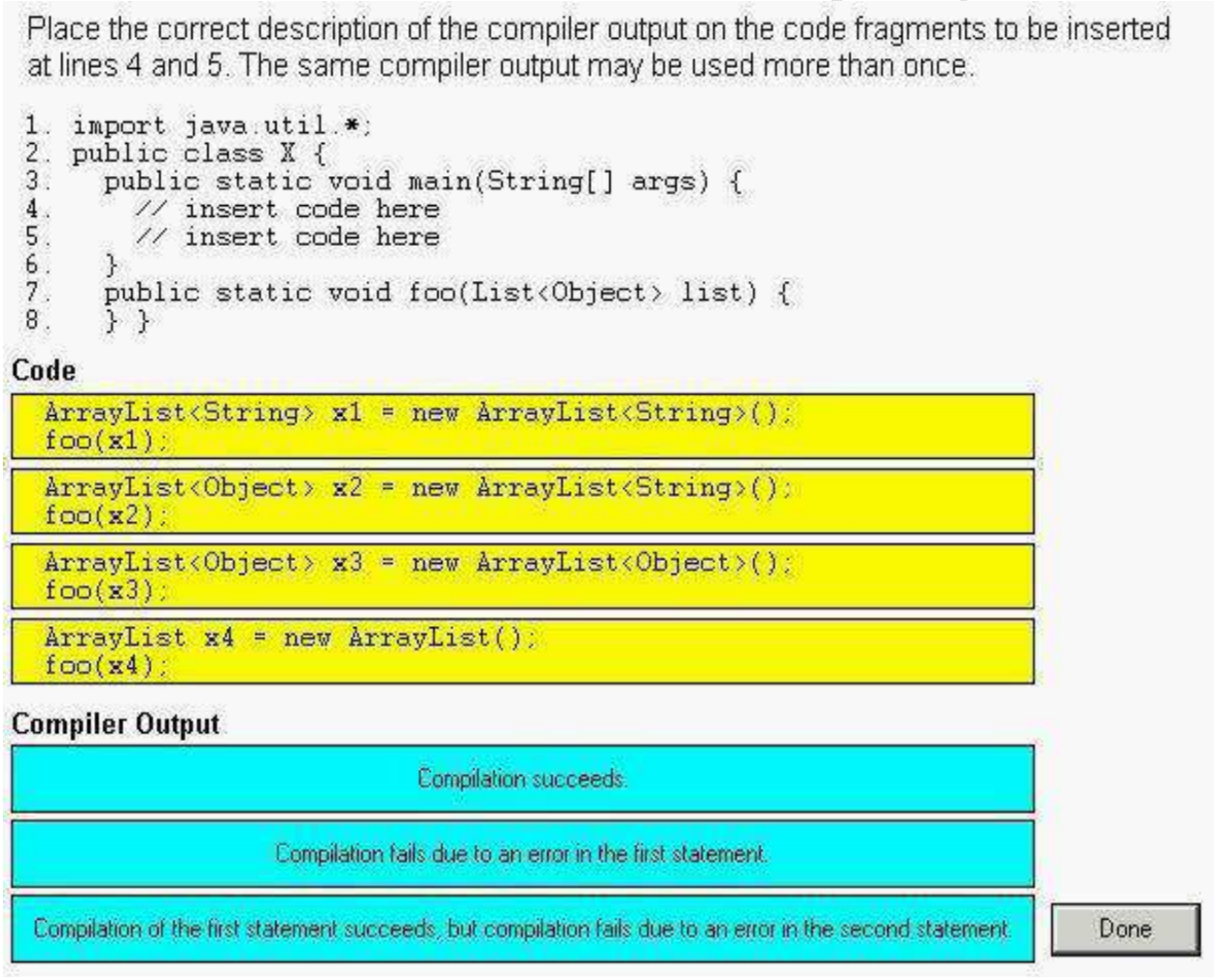
Answer: A
Q: 07 Given:
1. import java.util.*;
2. public class Old {
3. public static Object get0(List list) {
4. return list.get(0);
5. }
6. }
Which three will compile successfully? (Choose three.)
A. Object o = Old.get0(new LinkedList());
B. Object o = Old.get0(new LinkedList<?>());
C. String s = Old.get0(new LinkedList<String>());
D. Object o = Old.get0(new LinkedList<Object>());
E. String s = (String)Old.get0(new LinkedList<String>());
Answer: A, D, E

Q: 08 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: A

Q: 09 Given:
11. public static Collection get() {
12. Collection sorted = new LinkedList();
13. sorted.add("B"); sorted.add("C"); sorted.add("A");
14. return sorted;
15. }

16. public static void main(String[] args) {
17. for (Object obj: get()) {
18. System.out.print(obj + ", ");
19. }
20. }
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

Q:10 given
Click the Task button.



Solution:

1. **Compilation of the first statement succeeds ,but compilation fails due to an error in the second statement.**
2. **Compilation fails due to an error in the first statement**
3. **Compilation succeeds**

4. **Compilation succeeds**

Q: 11 Given:

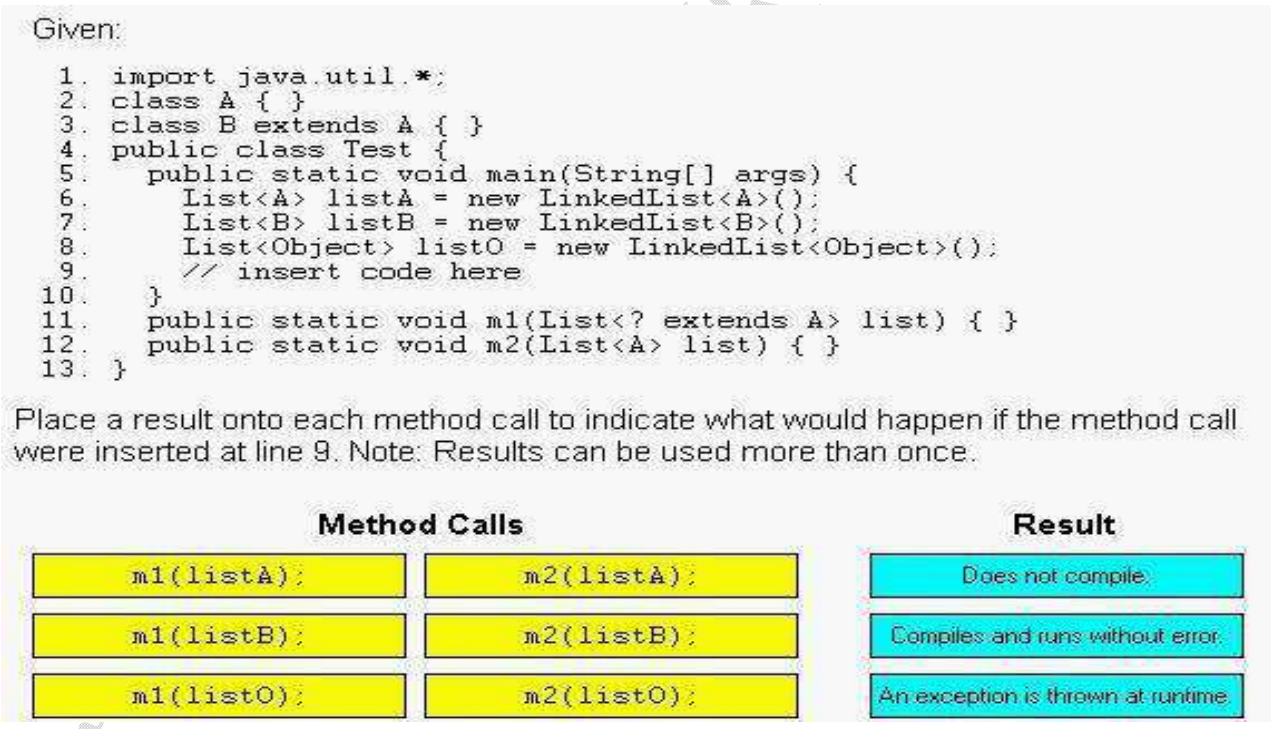
```
11. public static Iterator reverse(List list) {
12. Collections.reverse(list);
13. return list.iterator();
14. }
15. public static void main(String[] args) {
16. List list = new ArrayList();
17. list.add("1"); list.add("2"); list.add("3");
18. for (Object obj: reverse(list))
19. System.out.print(obj + ", ");
20. }
```

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

Q: 12 Click the Task button.



==========does not compile==========

1.m1(listO);
2.m2(listB);
3.m2(listO);

=====compiles and runs with out error=========

1.m1(listA);
2.m1(listB);

3.m2(listA);

Q: 13 Given:
1. import java.util.*;
2. public class PQ {
3. public static void main(String[] args) {
4. PriorityQueue<String> pq = new PriorityQueue<String>();
5. pq.add("carrot");
6. pq.add("apple");
7. pq.add("banana");
8. System.out.println(pq.poll() + ":" + pq.peek());
9. }
10. }
What is the result?
A. apple:apple
B. carrot:apple
C. apple:banana
D. banana:apple
E. carrot:carrot
F. carrot:banana
Answer: C

Q: 14 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

Q: 15 Given:
```
11. public class Key {
12. private long id1;
13. private long id2;
14.
15. // class Key methods
16. }
```
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: A, D

Q: 16 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. }
```
Which three changes must be made to the method sum to use generics? (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: A, C, F

Q: 17 Given:
```
11. // insert code here
12. private N min, max;
13. public N getMin() { return min; }
14. public N getMax() { return max; }
```

```
15. public void add(N added) {
16. if (min == null || added.doubleValue() < min.doubleValue()) 17. min = added;
18. if (max == null || added.doubleValue() > max.doubleValue()) 19. max = added;
20. }
21. }
```

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: D, F

Q: 18 Given:

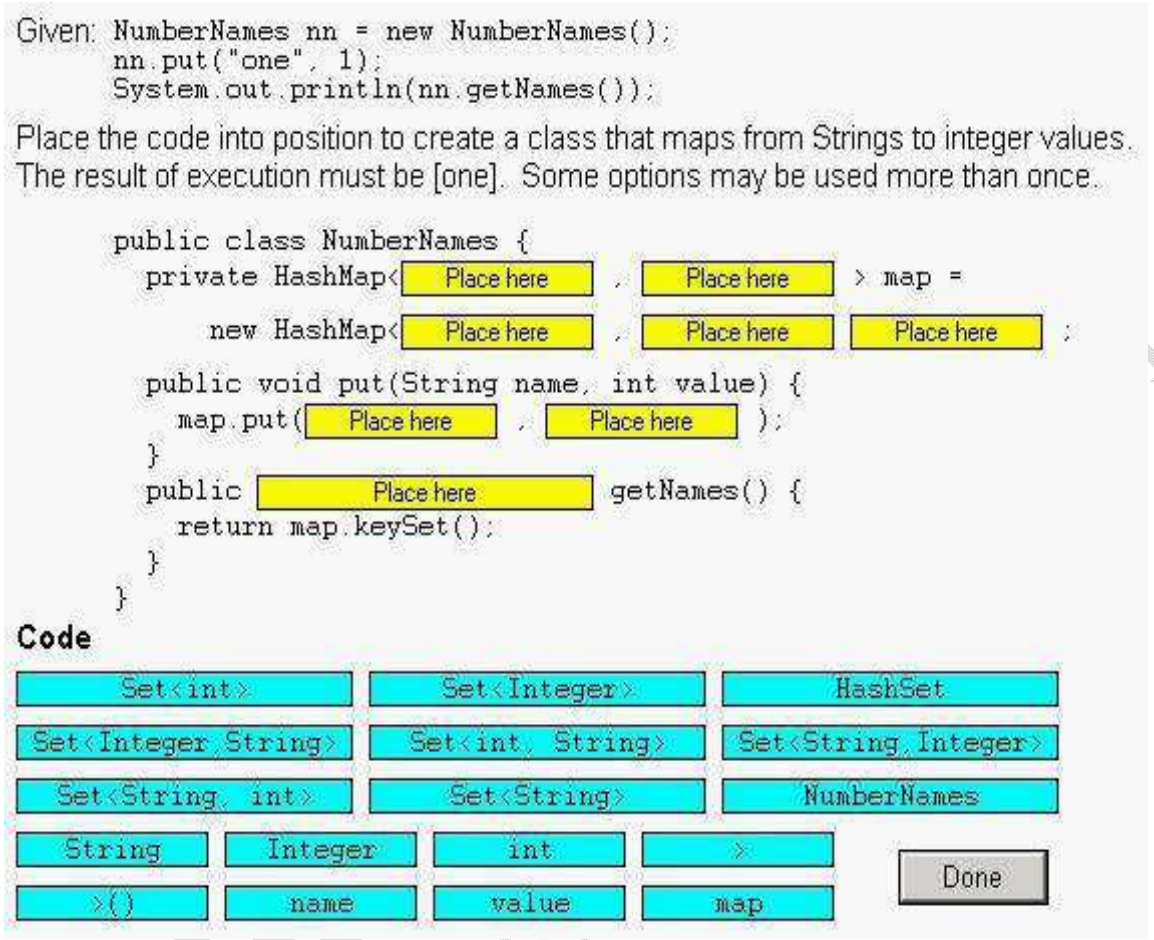
```
1. import java.util.*;
2.
3. public class LetterASort{
4. public static void main(String[] args) {
5. ArrayList<String> strings = new ArrayList<String>();
6. strings.add("aAaA");
7. strings.add("AaA");
8. strings.add("aAa");
9. strings.add("AAaa");
10. Collections.sort(strings);
11. for (String s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

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

Q: 19 Click the Task button.



Solution:

```
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( );
          }
}
```

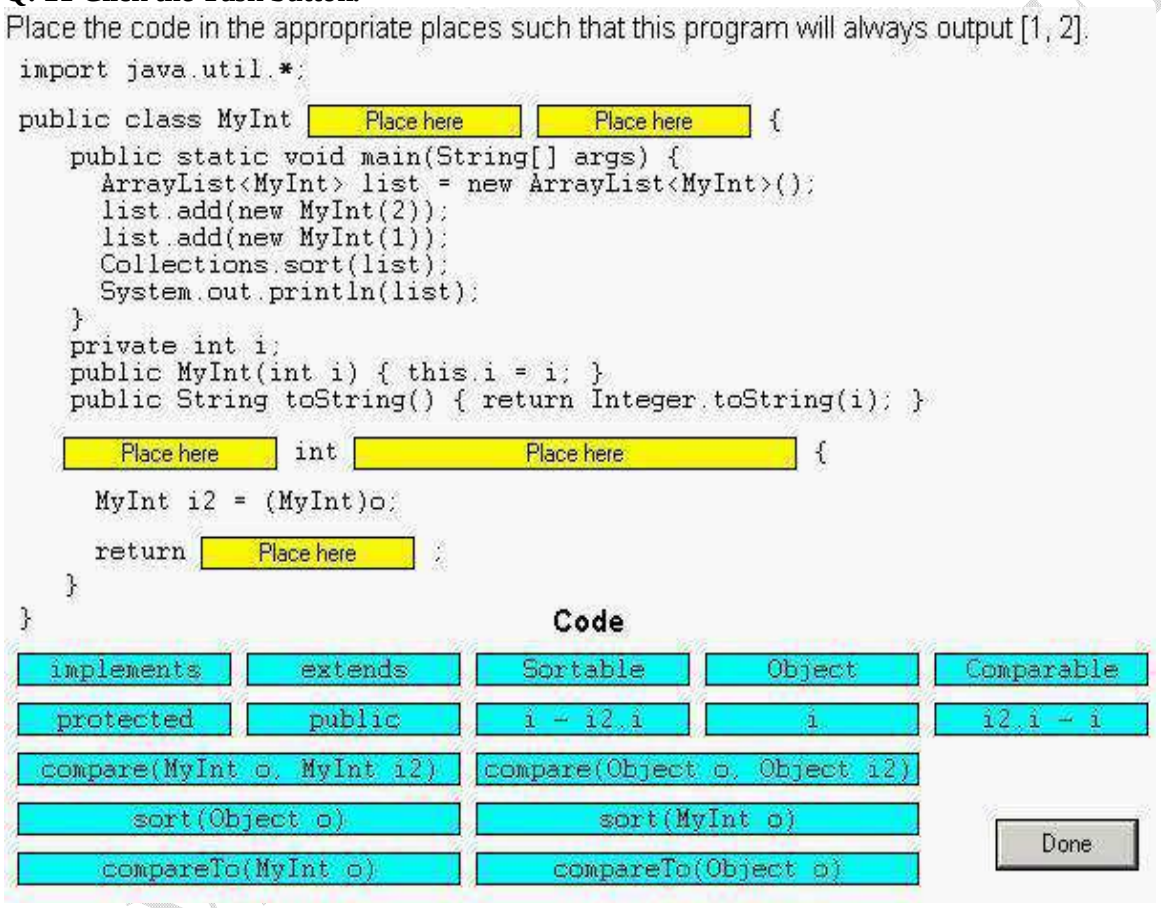
Q: 20 Which two statements are true about the hashCode method? (Choose two.)

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: C, E

Q: 21 Click the Task button.



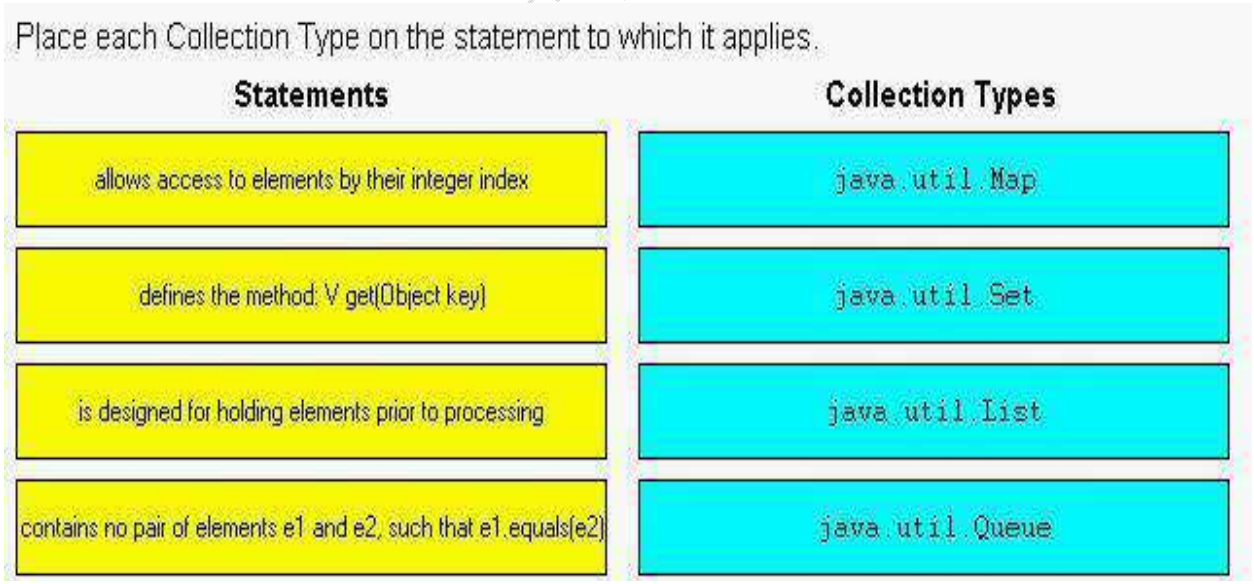
Solution:

1.implements
2.comparable
3.public
4.coompareTo(Object o)
5. i

Q: 22 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

Q: 23 Click the Task button.



Solution:
(1)-------(3) (2)---------(1) (3)-------(4) (4)---------(2)

Q: 24 Given:

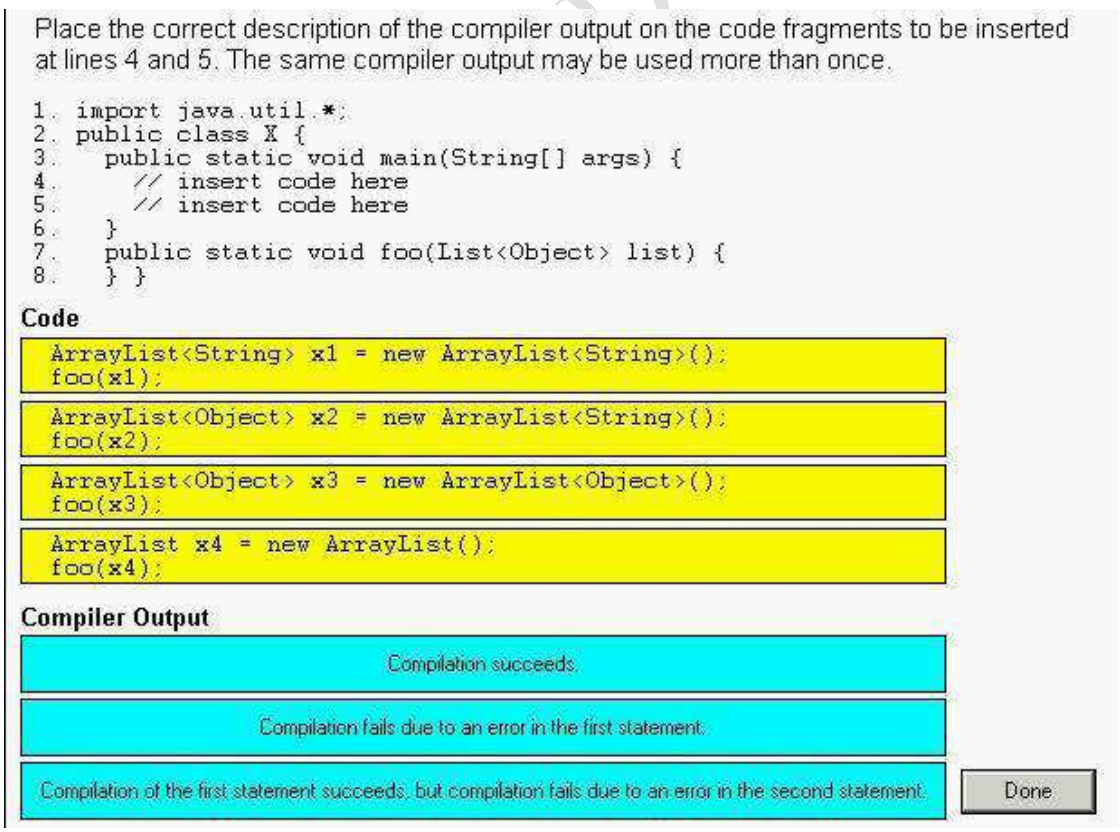
```
10. interface A { void x(); }
11. class B implements A { public void x() {} public void y() {} }
12. class C extends B { public void x() {} }
And:
20. java.util.List<A> list = new java.util.ArrayList<A>();
21. list.add(new B());
22. list.add(new C());
23. for (A a : list) {
24. a.x();
25. a.y();
26. }
```

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

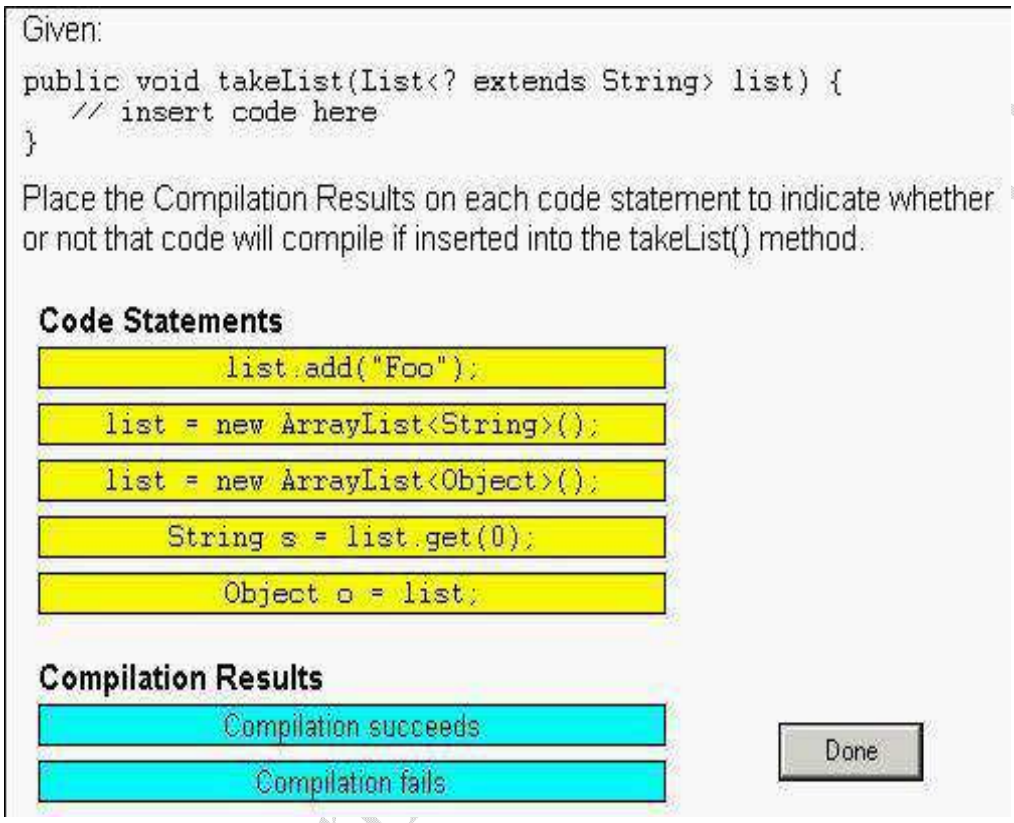
Q: 25 Click the Task button.



Solution:

4. **Compilation of the first statement succeeds ,but compilation fails due to an error in the second statement.**
5. **Compilation fails due to an error in the first statement**
6. **Compilation succeeds**
7. **Compilation succeeds**

Q: 26 Click the Task button.



Solution:

1. list.add("foo"); ---------- Compilation fails
2. list = new ArrayList<String>(); ------Compilation succeeds
3.list=new ArrayList<Object>( ); ---- Compilation fails
4. String s = list.get(0); ------ Compilation succeeds
5. Object o = list; ----- Compilation succeeds

Q: 27 Given:
1. public class Drink implements Comparable {
2. public String name;
3. public int compareTo(Object o) {
4. return 0;
5. }
6. }
and:

20. Drink one = new Drink();
21. Drink two = new Drink();
22. one.name= "Coffee";
23. two.name= "Tea";
23. TreeSet set = new TreeSet();
24. set.add(one);
25. 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

Q:28 Click the Task button.

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.

Solutions:
compilation fails:
Public void takeList(ArrayList<Animal> list) { }
Public void takeList(ArrayList<Object> list) { }
compilation Succeeds
All the remaining

Q: 29 Click the Task button.

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());

Solution:

```
import java.util.*;
    public class TestGenericConversion {
    public static void main(String s[ ]){
    List<String> list=new LinkedList<String>( );
    list.add("one");
    list.add("two");
    System.out.println(list.get(0).length(); }
    } }
```

Q: 30 Given:

```
10. abstract public class Employee {
11. protected abstract double getSalesAmount();
12. public double getCommision() {
13. return getSalesAmount() * 0.15;
14. }
```

```
15. }
16. class Sales extends Employee {
17. // insert method here
18. }
```

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: B, D

Q: 31 Given:

```
13. public static void search(List<String> list) {
14. list.clear();
15. list.add("b");
16. list.add("a");
17. list.add("c");
18. System.out.println(Collections.binarySearch(list, "a"));
19. }
```

What is the result of calling search with a valid List implementation?

A. 0 B. 1
C. 2 D. a
E. b F. c
G. The result is undefined.

Answer: G

Q: 32 Given:

```
11. public static void append(List list) { list.add("0042"); }
12. public static void main(String[] args) {
13. List<Integer> intList = new ArrayList<Integer>();
14. append(intList);
15. System.out.println(intList.get(0));
16. }
```

What is the result?

A. 42
B. 0042
C. An exception is thrown at runtime.
D. Compilation fails because of an error in line 13.
E. Compilation fails because of an error in line 14.

Answer: B

Q: 33 Given:
11. public class Person {
12. private name;
13. public Person(String name) {
14. this.name = name;
15. }
16. public int hashCode() {
17. return 420;
18. }
19. }
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

Q: 34
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

Q: 35 Given:
int[] myArray = new int[] {1, 2, 3, 4, 5}; What allows you to create a list from this array?
A. List myList = myArray.asList();
B. List myList = Arrays.asList(myArray);
C. List myList = new ArrayList(myArray);

D. List myList = Collections.fromArray(myArray);
Answer: B

Question: 36
Given:
```
1. public class Score implements Comparable<Score> {
2. private int wins, losses;
3. public Score(int w, int 1) { wins = w; losses = 1; }
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. }
```
Which method will complete this class?
A. public int compareTo(Object o) {/*mode 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: 37
Click the Exhibit button.
```
1. import java.util.*;
2. class KeyMaster {
3. public int i;
4. public KeyMaster(int i) { this.i = i; }
5. public boolean equals(Object o) { return i == ((KeyMaster)o).i; }
6. public int hashCode() { return i; }
7. }
8. public class MapIt {
9. public static void main(String[] args) {
10. Set<KeyMaster> set = new HashSet<KeyMaster>();
11. KeyMaster k1 = new KeyMaster(1);
12. KeyMaster k2 = new KeyMaster(2);
13. set.add(k1); set.add(k1);
14. set.add(k2); set.add(k2);
15. System.out.print(set.size() + ":");
16. k2.i = 1;
17. System.out.print(set.size() + ":");
18. set.remove(k1);
19. System.out.print(set.size() + ":");
20. set.remove(k2);
21. System.out.print(set.size());
22. }
23. }
```
What is the result?
A. 4:4:2:2 B. 4:4:3:2
C. 2:2:1:0 D. 2:2:0:0

E. 2:1:0:0 F. 2:2:1:1
G. 4:3:2:1
Answer: F

Question: 38
Given:
1. import java.util.*;
2. public class Test {
3. public static void main(String[] args) {
4. List<String> strings = new ArrayList<String>();
***5.* // insert code here**
6. }
7. }
Which four, inserted at line *5*, will allow compilation to succeed? (Choose four.)
A. String s = strings.get(0);
B. Iterator i1 = strings.iterator();
C. String[] array1 = strings.toArray();
D. Iterator<String> i2 = strings.iterator();
E. String[] array2 = strings.toArray(new String[1]);
F. Iterator<String> i3 = strings.iterator<String>();
Answer: ABDE

Question: 39
Given:
classA {}
class B extends A {}
class C extends A {}
class D extends B {}
Which three statements are true? (Choose three.)
A. The type List<A> is assignable to List.
B. The type List<B> is assignable to List<A>.
C. The type List<Object> is assignable to List<?>.
D. The type List<D> is assignable to List<? extends B>.
E. The type List<? extends A> is assignable to List<A>.
F. The type List<Object> is assignable to any List reference.
G. The type List<? extends B> is assignable to List<? extends A>.

Answer: CDG

Question:40
Given:
11. public void addStrings(List list) {
12. list.add("foo");
13. list.add("bar");
14. }
What must you change in this method to compile without warnings?
A. add this code after line 11:
list = (List<String>) list;
B. change lines 12 and 13 to:
list.add<String>("foo");
list.add<String>("bar");
C. change the method signature on line 11 to:
public void addStrings(List<? extends String> list) {
D. change the method signature on line 11 to:
public void addStrings(List<? super String> list) {
E. No changes are necessary. This method compiles without warnings.

Answer: D

Question: 41
Given:
1. public class Test {
2. public <T extends Comparable> T findLarger(T x, T y) {
3. if(x.compareTo(y) > 0) {
4. return x;
5. } else {
6. return y;
7. }
8. }
9. }
and:
22. Test t = new Test();
23. // insert code here
Which two will compile without errors when inserted at line 23?
(Choose two.)
A. Object x = t.findLarger(123, *"456");*
B. int x = t.findLarger(123, new Double(456));
C. int x = t.findLarger(123, new Integer(456));
D. int x = (int) t.findLarger(new Double(123), new Double(456));

Answer: AC

Question: 42
Given:
11. List list = // more code here
12. Collections.sort(list, new MyComparator());
Which code will sort this list in the opposite order of the sort in line

12?
A. Collections.reverseSort(list, new MyComparator());
B. Collections.sort(list, new MyComparator());
list.reverse();
C. Collections.sort(list, new InverseComparator(
new MyComparator()));
D. Collections.sort(list, Collections.reverseOrder(
new MyComparator()));
Answer: D

Question: 43
Given:

ArrayList a = new ArrayList();
containing the values {"1", "2", "3", "4", "5", "6", "7", "8"}
Which code will return 2?
A. Collections. sort(a, a.reverse());
int result = Collections.binarySearch(a, "6");
B. Comparator c = Collections.reverseOrder();
Collections.sort(a, c);
int result = Collections.binarySearch(a, "6");
C. Comparator c = Collections.reverseOrder();
Collections.sort(a, c);
int result = Collections.binarySearch(a, "6",c);
D. Comparator c = Collections.reverseOrder(a);
Collections.sort(a, c);
int result = Collections.binarySearch(a, "6",c);
E. Comparator c = new InverseComparator(new Comparator());
Collections.sort(a);
int result = Collections.binarySearch(a, "6",c);

Answer: C

Question: 44
Given:

```
11. public class Counter {
12. public static void main(String[] args) {
13. int numArgs = /* insert code here */;
14. }
15. }
```

and the command line:
java Counter one fred 42
Which code, inserted at line 13, captures the number of arguments passed into the program?
A. args.count
B. args.length
C. args.count()
D. args.length()
E. args.getLength()

Answer: B

Question: 45
Given:

```
3. import java.util.*;
4. public class Mapit {
5. public static void main(String[] args) {
6. Set<Integer> set = new HashSet<Integer>();
7. Integer i1 = 45;
8. Integer i2 = 46;
9. set.add(i1);
10. set.add(i1);
11. set.add(i2); System.out.print(set.size() + " ");
12. set.remove(i1); System.out.print(set.size() + " ");
13. i2 = 47;
14. set.remove(i2); System.out.print(set.size() + " ");
15. }
16. }
```

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: 46
Given:

```
12. import java.util.*;
13. public class Explorer1 {
```

```
14. public static void main(String[] args) {
15. TreeSet<Integer> s = new TreeSet<Integer>();
16. TreeSet<Integer> subs = new TreeSet<Integer>();
17. for(int i = 606; i < 613; i++) 18. if(i%2 == 0) s.add(i);
19. subs = (TreeSet)s.subSet(608, true, 611, true);
20. s.add(609);
21. System.out.println(s + " " + subs);
22. }
23. }
```

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: 47
Given:

```
3. import java.util.*;
4. public class Quest {
5. public static void main(String[] args) {
6. String[] colors = {"blue", "red", "green", "yellow", "orange"};
7. Arrays.sort(colors);
8. int s2 = Arrays.binarySearch(colors, "orange");
9. int s3 = Arrays.binarySearch(colors, "violet");
10. System.out.println(s2 + " " + s3);
11. }
12. }
```

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: 48
Given:

```
5. import java.util.*;
6. public class SortOf {
7. public static void main(String[] args) {
8. ArrayList<Integer> a = new ArrayList<Integer>();
9. a.add(1); a.add(5); a.add(3);
11. Collections.sort(a);
12. a.add(2);
```

13. Collections.reverse(a);
14. System.out.println(a);
15. }
16. }
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: 49
Given:
3. import java.util.*;
4. public class Hancock {
5. // insert code here 6. list.add("foo");
7. }
8. }
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) {
Answer: B,C

Question: 50
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: A,C

13.Inner Classes

Q: 01 Given:
10. class Line {
11. public static class Point {}
12. }
13.
14. class Triangle {
15. // insert code here
16. }
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

Q: 02 Given:

11. static class A {
12. void process() throws Exception { throw new Exception(); }
13. }
14. static class B extends A {
15. void process() { System.out.println("B "); }
16. }
17. public static void main(String[] args) {
18. A a = new B();
19. a.process();
20. }
What is the result?
A. B
B. The code runs with no output.
C. An exception is thrown at runtime
D. Compilation fails because of an error in line 15.
E. Compilation fails because of an error in line 18.
F. Compilation fails because of an error in line 19.

Answer: F

Q: 03 Given:
1. package geometry;
2. public class Hypotenuse {
3. public InnerTriangle it = new InnerTriangle();
4. class InnerTriangle {
5. public int base;
6. public int height;
7. }
8. }
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

Q: 04 Given:
10. class Line {
11. public class Point { public int x,y;}
12. public Point getPoint() { return new Point(); }
13. }
14. class Triangle {
15. public Triangle() {
16. // insert code here
17. }
18. }

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

14.Internationalization

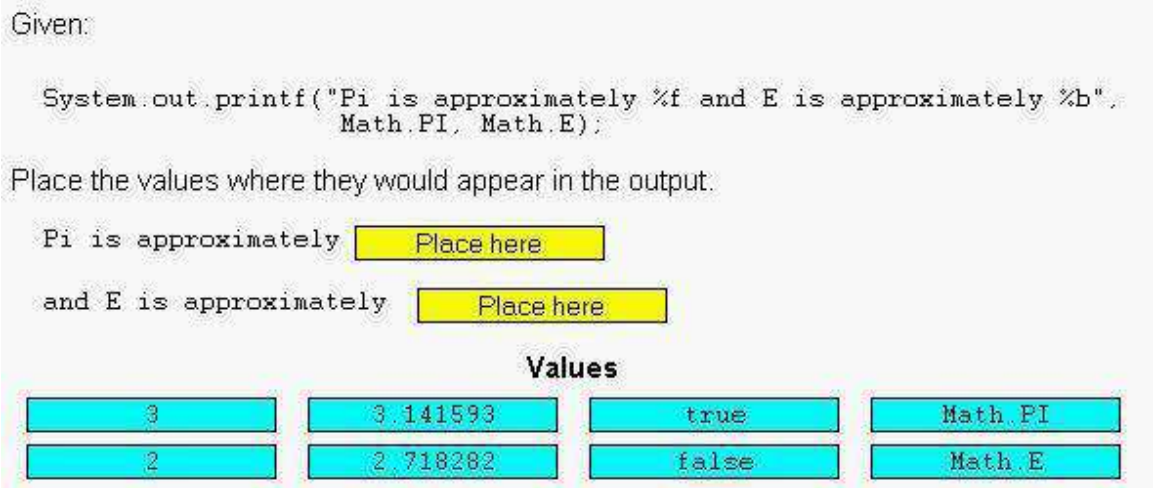
Q: 01 Given:
11. String test = "This is a test";
12. String[] tokens = test.split("\s");
13. System.out.println(tokens.length);
What is the result?
A. 0
B. 1
C. 4
D. Compilation fails.
E. An exception is thrown at runtime
Answer: D
Q: 02 Given:
12. System.out.format("Pi is approximately %d.", Math.PI);
What is the result?
A. Compilation fails.
B. Pi is approximately 3.
C. Pi is approximately 3.141593.
D. An exception is thrown at runtime.

Answer: D
Q: 03 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

Q: 04 Given:
12. NumberFormat nf = NumberFormat.getInstance();
13. nf.setMaximumFractionDigits(4);
14. nf.setMinimumFractionDigits(2);
15. String a = nf.format(3.1415926);

16. 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: C, F

Q: 05 Click the Task button.



Solution:

Pi is Approximately 3.141593
and E is Approximately true

Q: 05 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?

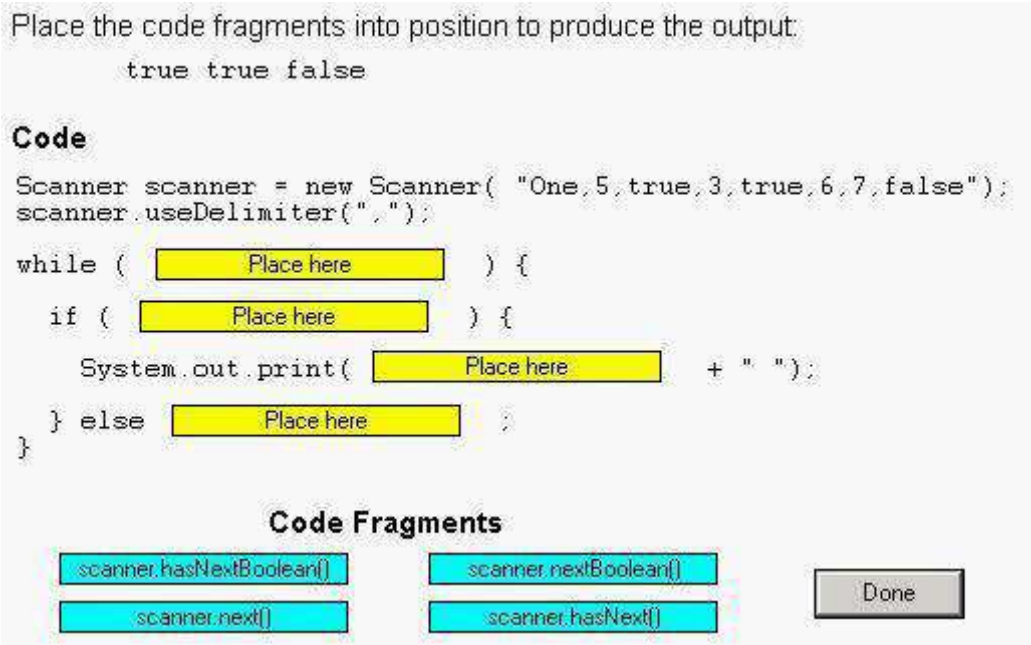
A. The value of s is 14-dic-2004.
B. The value of s is Dec 14, 2000.
C. An exception is thrown at runtime.
D. Compilation fails because of an error in line 13.

Answer: D

Q: 06 Given:
d is a valid, non-null Date object
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

Q: 07
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

Q: 08 Click the Task button.



Solution:

```
Scanner scanner =new Scanner(One, 5 true,3,true,6,7,false");
scanner.useDelimiter(" ,");
        while( scanner.hasNext( ) ) {
          if ( scanner.hasNextBoolean( ) ){
            system.out.print(scanner.nextBoolean( )+"   " );
          }else   scanner.Next( );
       }
```

Q: 09 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

Q: 10 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

Q: 11 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: 12
Given:
14. DateFormat df;
***15.* Date date = new Date();**
16. //insert code here
17. String s = df.format(date);
Which two, inserted independently at line 16, allow the code to compile? (Choose two.)
A. df= new DateFormat();
B. df= Date.getFormatter();
C. df= date.getFormatter();
D. df= date.getDateFormatter();
E. df= Date.getDateFormatter();

F. df= DateFormat.getInstance();
G. df = DateFormat.getDateInstance();
Answer: FG

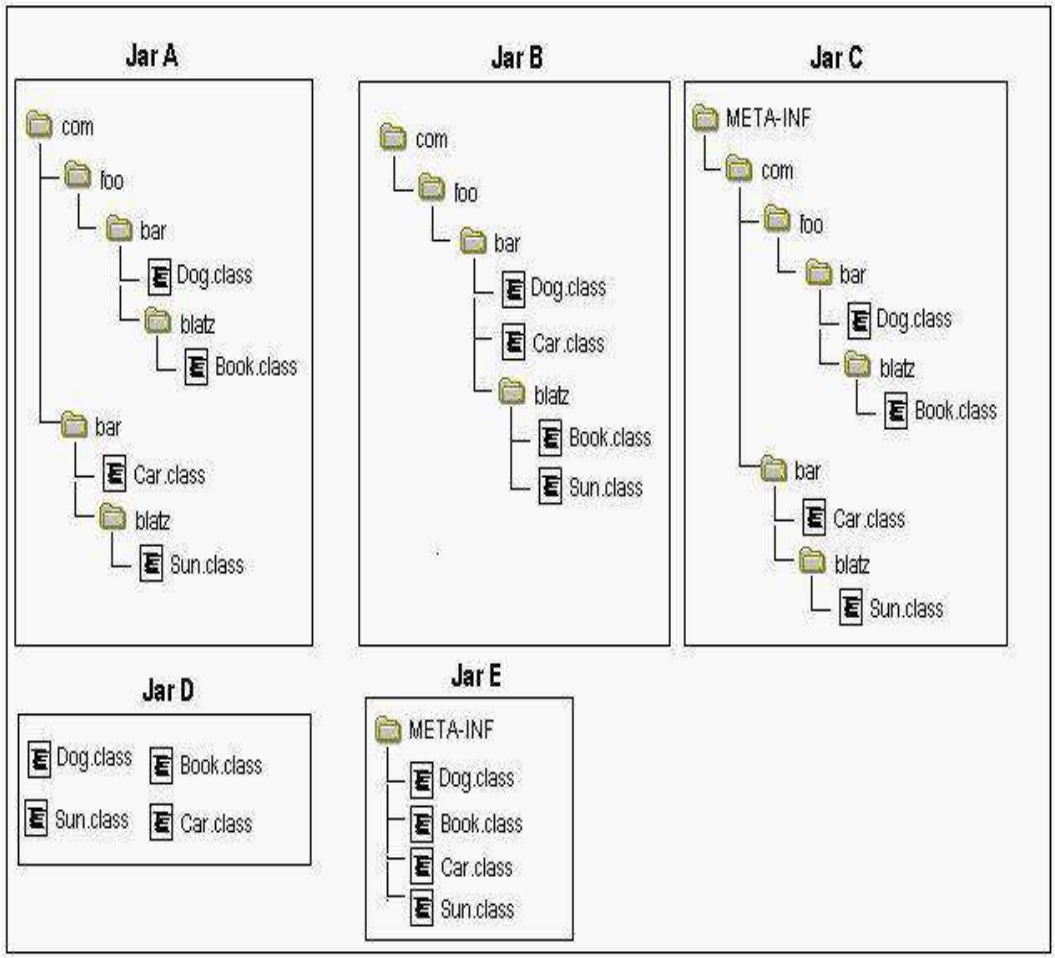
Question: 13
Given:
11. String test = "Test A. Test B. Test C.";
12. // insert code here
13. String[] result = test.split(regex);
Which regular expression inserted at line 12 will correctly split test into "Test A," "Test B," and "Test C"?
A. String regex = "";
B. String regex = " ";
C. String regex = ".*".
D. String regex = "\\s"
E. String regex = "\\.\\s*";
F. String regex = "\\w[\.] +";
Answer: E

Question: 14
Given:
5. import java.util.Date;
6. import java.text.DateFormat;
21. DateFormat df;
22. Date date = new Date();
23. // insert code here
24. 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

15.Development

Q: 01 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

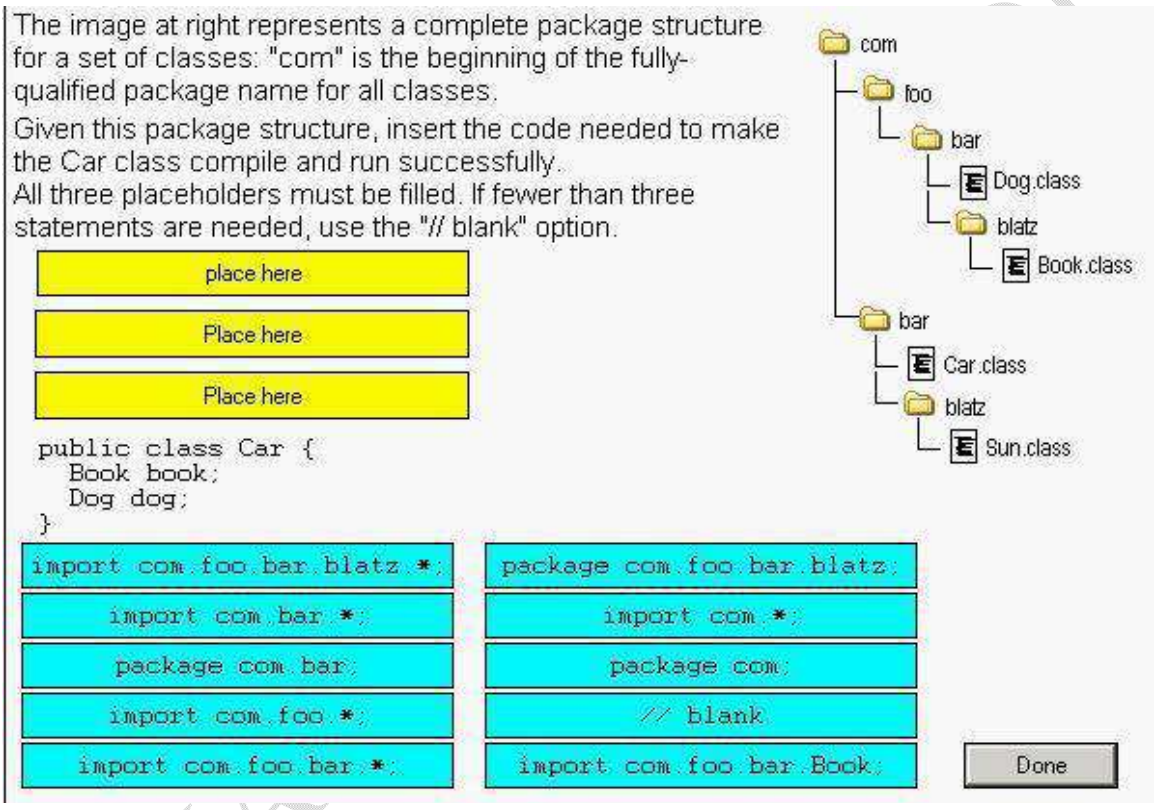
Q: 02
A class games.cards.Poker is correctly defined in the jar file Poker.jar. A user wants to execute the main method of Poker on a UNIX system using the command: java games.cards.PokerWhat allows the user to do this?
A. put Poker.jar in directory /stuff/java, and set the CLASSPATH to include /stuff/java
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

Q: 03 Given:
11. public class Commander {
12. public static void main(String[] args) {
13. String myProp = /* insert code here */
14. System.out.println(myProp);
15. }
16. }
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: D, E

Q: 04
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 thedeveloper 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: B, D, G

Q: 05 Click the Task button.



Solution:

1. **package com.bar;**
2. **import com.foo.bar.*;**
3. **import com.foo.bar.blatz.*;**

Q: 06 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: B, C

Q: 07 Given a correctly compiled class whose source code is:
1. package com.sun.sjcp;
2. public class Commander {
3. public static void main(String[] args) {
4. // more code here
5. }
6. }
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

Q: 08
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

Q: 09
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