Java Standard Edition 6 Programmer Certified Professional Exam - Mock Exam III

Section 1: Declarations, Initialization and Scoping

- Develop code that declares classes (including abstract and all forms of nested classes), interfaces, and enums, and includes the appropriate use of package and import statements (including static imports).
- Develop code that declares an interface. Develop code that implements or extends one or more interfaces.
- Develop code that declares an abstract class. Develop code that extends an abstract class.
- Develop code that declares, initializes, and uses primitives, arrays, enums, and objects as static, instance, and local variables. Also, use legal identifiers for variable names.
- Given a code example, determine if a method is correctly overriding or overloading another method, and identify legal return values (including covariant returns), for the method.
- Given a set of classes and superclasses, develop constructors for one or more of the classes. Given a class declaration, determine if a default constructor will be created, and if so, determine the behavior of that constructor. Given a nested or non-nested class listing, write code to instantiate the class.

Section 2: Flow Control

- Develop code that implements an if or switch statement; and identify legal argument types for these statements.
- Develop code that implements all forms of loops and iterators, including the use of for, the enhanced for loop (for-each), do, while, labels, break, and continue; and explain the values taken by loop counter variables during and after loop execution.
- Develop code that makes use of assertions, and distinguish appropriate from inappropriate uses of assertions.
- Develop code that makes use of exceptions and exception handling clauses (try, catch, finally), and declares methods and overriding methods that throw exceptions.
- Recognize the effect of an exception arising at a specified point in a code fragment. Note that the exception may be a runtime exception, a checked exception, or an error.
- Recognize situations that will result in any of the following being thrown: ArrayIndexOutOfBoundsException,ClassCastException, IllegalArgumentException, IllegalStateException, NullPointerException, NumberFormatException, AssertionError, ExceptionInInitializerError, StackOverflowError or NoClassDefFoundError. Understand which of these are thrown by the virtual machine and recognize situations in which others should be thrown programatically.

Section 3: API Contents

- Develop code that uses the primitive wrapper classes (such as Boolean, Character, Double, Integer, etc.), and/or autoboxing & unboxing. Discuss the differences between the String, StringBuilder, and StringBuffer classes.
- Given a scenario involving navigating file systems, reading from files, writing to files, or interacting with the user, develop the correct solution using the following classes (sometimes in combination), from java. io: BufferedReader, BufferedWriter, File, FileReader, FileWriter, PrintWriter, and Console.
- Use standard J2SE APIs in the java.text package to correctly format or parse dates, numbers, and currency values for a specific locale; and, given a scenario, determine the appropriate methods to use if you want to use the default locale or a specific locale. Describe the purpose and use of the java.util. Locale class.
- Write code that uses standard J2SE APIs in the java.util and java.util.regex packages to format or parse strings or streams. For strings, write code that uses the Pattern and Matcher classes and the String.split method. Recognize and use regular expression patterns for matching (limited to: . (dot), * (star), + (plus), ?, \d, \s, \w, [], ()). The use of *, +, and ? will be limited to greedy quantifiers, and the parenthesis operator will only be used as a grouping mechanism, not for capturing content during matching. For streams, write code using the Formatter and Scanner classes and the PrintWriter.format/printf methods. Recognize and use formatting parameters (limited to: %b, %c, %d, %f, %s) in format strings.

Section 4: Concurrency

- Write code to define, instantiate, and start new threads using both java.lang.Thread and java.lang.

Runnable.
- Recognize the states in which a thread can exist, and identify ways in which a thread can transition from one state to another.
- Given a scenario, write code that makes appropriate use of object locking to protect static or instance variables from concurrent access problems.

Section 5: OO Concepts

- Develop code that implements tight encapsulation, loose coupling, and high cohesion in classes, and describe the benefits.
- Given a scenario, develop code that demonstrates the use of polymorphism. Further, determine when casting will be necessary and recognize compiler vs. runtime errors related to object reference casting.
- Explain the effect of modifiers on inheritance with respect to constructors, instance or static variables, and instance or static methods.
- Given a scenario, develop code that declares and/or invokes overridden or overloaded methods and code that declares and/or invokes superclass, or overloaded constructors.
- Develop code that implements "is-a" and/or "has-a" relationships.

Section 6: Collections / Generics

- Given a design scenario, determine which collection classes and/or interfaces should be used to properly implement that design, including the use of the Comparable interface.
- Distinguish between correct and incorrect overrides of corresponding hashCode and equals methods, and explain the difference between == and the equals method.
- Write code that uses the generic versions of the Collections API, in particular, the Set, List, and Map interfaces and implementation classes. Recognize the limitations of the non-generic Collections API and how to refactor code to use the generic versions. Write code that uses the NavigableSet and NavigableMap interfaces.
- Develop code that makes proper use of type parameters in class/interface declarations, instance variables, method arguments, and return types; and write generic methods or methods that make use of wildcard types and understand the similarities and differences between these two approaches.
- Use capabilities in the java.util package to write code to manipulate a list by sorting, performing a binary search, or converting the list to an array. Use capabilities in the java.util package to write code to manipulate an array by sorting, performing a binary search, or converting the array to a list. Use the java.util.Comparator and java.lang.Comparable interfaces to affect the sorting of lists and arrays. Furthermore, recognize the effect of the "natural ordering" of primitive wrapper classes and java.lang. String on sorting.

Section 7: Fundamentals

- Given a code example and a scenario, write code that uses the appropriate access modifiers, package declarations, and import statements to interact with (through access or inheritance) the code in the example.
- Given an example of a class and a command-line, determine the expected runtime behavior.
- Determine the effect upon object references and primitive values when they are passed into methods that perform assignments or other modifying operations on the parameters.
- Given a code example, recognize the point at which an object becomes eligible for garbage collection, determine what is and is not guaranteed by the garbage collection system, and recognize the behaviors of the Object.finalize() method.
- Given the fully-quali fied name of a class that is deployed inside and/or outside a JAR file, construct the appropriate directory structure for that class. Given a code example and a classpath, determine whether the classpath will allow the code to compile successfully.
- Write code that correctly applies the appropriate operators including assignment operators (limited to: =, +=, -=), arithmetic operators (limited to: +, -, *, /, %, ++, --), relational operators (limited to: <, <=, >, >=, ==, !=), the instanceof operator, logical operators (limited to: &, |, ^, !, &&, ||), and the conditional operator (? :), to produce a desired result. Write code that determines the equality of two objects or two primitives

Exam A

QUESTION 1
Given:

```
import java.util.Date;
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();`

Correct Answer: E

QUESTION 2
Given:

```
public class BuildStuff {
    public static void main(String[] args) {
        Boolean test = new Boolean(true);
        Integer x = 343;
        Integer y = new BuildStuff().go(test, x);
        System.out.println(y);
    }
    int go(Boolean b, int i) {
        if(b) return (i/7);
        return (i/49);
    }
}
```

What is the result?

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

Correct Answer: B

QUESTION 3
Given:

```
import java.io.*;

public class Forest implements Serializable {
    private Tree tree = new Tree();

    public static void main(String [] args) {
        Forest f = new Forest();
        try {

            FileOutputStream fs = new FileOutputStream("Forest.ser");
```

```
            ObjectOutputStream os = new ObjectOutputStream(fs);
            os.writeObject(f); os.close();
        } catch (Exception ex) { ex.printStackTrace(); }
    }
}

class Tree { }
```

What is the result?

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

Correct Answer: B

QUESTION 4
Given:

```
01. import java.io.*;
02.
03. public class Talk {
04.    public static void main(String[] args) {
05.        Console c = new Console();
06.        String pw;
07.        System.out.print("password: ");
08.        pw = c.readLine();
09.        System.out.println("got " + pw);
10.    }
11. }
```

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 5.

Correct Answer: E

QUESTION 5
Given:

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

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

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

Correct Answer: E

QUESTION 6
Given:

```
01. interface A { public void aMethod(); }
02. interface B { public void bMethod(); }
03. interface C extends A,B { public void cMethod(); }
04. class D implements B {
05. public void bMethod(){}
06. }
07. class E extends D implements C {
08. public void aMethod(){}
09. 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.

Correct Answer: F

QUESTION 7
Given:

```
public class SimpleCalc {
    public value;
    public void calculate() { value += 7; }
}
```

and:

```
public class MultiCalc extends SimpleCalc {
    public void calculate() { value -= 3; }
    public void calculate(int multiplier) {
        calculate();
        super.calculate();
        value *= multiplier;
    }
    public statuc void main(String[] args) {
        MultiCalc calculator = new MultiCalc();
        calculator.calculate(2);
        System.out.println("Value is: " + calculator.value);
    }
}
```

What is the result?

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.

Correct Answer: A

QUESTION 8
Given:

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

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

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

What is the result?

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

Correct Answer: D

QUESTION 9
Given:

```
class Mammal {
}

class Raccoon extends Mammal {
    Mammal m = new Mammal();
}

class BabyRaccoon extends Mammal {
}
```

Which four statements are true? (Choose four.)

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

Correct Answer: ABCF

QUESTION 10

Given:

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

Correct Answer: F

QUESTION 11
Given:

```
01. public class Hi {
02.     void m1() { }
03.     protected void() m2 { }
04. }
05.
06. class Lois extends Hi {
07.     // insert code here
08. }
```

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() { }`

Correct Answer: ABEF

QUESTION 12
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.

Correct Answer: CDEG

QUESTION 13
Given:

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

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

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

and:

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

What is the result?

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

Correct Answer: C

QUESTION 14
Given:

```
package geometry;

public class Hypotenuse {
    public InnerTriangle it = new InnerTriangle();

    class InnerTriangle {
        public int base;
        public int height;
    }
}
```

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.

Correct Answer: C

QUESTION 15

Given:

```
interface Data { public void load(); }
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*/ }
}
```

Correct Answer: A

QUESTION 16
Given:

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

What is the result?

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

Correct Answer: E

QUESTION 17
Given:

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

```
}
class C3 extends C2 {
    public C3() { System.out.println(3); }
}
public class Ctest {
    public static void main(String[] a) { new C3(); }
}
```

What is the result?

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

Correct Answer: D

QUESTION 18
Given:

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

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

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

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

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

Correct Answer: CD

QUESTION 19
Which two classes correctly implement both the `java.lang.Runnable` and the `java.lang.Cloneable` interfaces? (Choose two.)

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

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

Correct Answer: CD

QUESTION 20
Given:

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

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

What is the result?

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

Correct Answer: C

QUESTION 21
Given:

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

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

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

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

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

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

Correct Answer: D

QUESTION 22
Given:

```
class TestA {
    public void start() { System.out.println("TestA"); }
}

public class TestB extends TestA {
    public void start() { System.out.println("TestB"); }
    public static void main(String[] args) {
        ((TestA)new TestB()).start();
    }
}
```

What is the result?

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

Correct Answer: B

QUESTION 23
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.

Correct Answer: A

QUESTION 24
Click the Exhibit button.

```
public class Threads1 {
    int x = 0;
    public class Runner implements Runnable {
        public void run(){
            int current = 0;
            for(int i = 0; i<4; i++){
                current = x;
                System.out.println(current + ", ");
                x = current + 2;
            }
        }
    }
```

```
    public static void main(String[] args) {
        new Threads1().go();
    }

    public void go(){
        Runnable r1 = new Runner();
        new Thread(r1).start();
        new Thread(r1).start();
    }
}
```

Which two are possible results? (Choose two.)

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

Correct Answer: C

QUESTION 25
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();`

Correct Answer: E

QUESTION 26
Given:

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

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

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

Which two statements are true? (Choose two.)

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

Correct Answer: CD

QUESTION 27
Click the Exhibit button.

```
class Computation extends Thread {
    private int num;
    private boolean isComplete;
    private int result;

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

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

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

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

What is the result?

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

Correct Answer: F

QUESTION 28
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();
```

Correct Answer: DF

QUESTION 29
Given:

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

Which statement is true?

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

Correct Answer: B

QUESTION 30
Given:

```
import java.util.*;

public class SortOf {
    public static void main(String[] args) {
        ArrayList<Integer> a = new ArrayList<Integer>();
        a.add(1); a.add(5); a.add(3);
        Collections.sort(a);
        a.add(2);
        Collections.reverse(a);
        System.out.println(a);
    }
}
```

What is the result?

A. [1, 2, 3, 5]
B. [2, 1, 3, 5]
C. [2, 5, 3, 1]
D. [5, 3, 2, 1]
E. [1, 3, 5, 2]

F. Compilation fails.
G. An exception is thrown at runtime.

Correct Answer: C

QUESTION 31
Given:

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

Which statement is true?

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

Correct Answer: A

QUESTION 32
Given:

```
import java.util.TreeSet;

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

What is the result?

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

Correct Answer: E

QUESTION 33
Given:

```
public class Drink implements Comparable {
    public String name;
```

```
    public int compareTo(Object o) {
        return 0;
    }
}
```

and:

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

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

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

Correct Answer: B

QUESTION 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 */ }
  }
```

Correct Answer: A

QUESTION 35
Given:

```
01. import java.util.*;
```

```
02. public class Example {
03.    public static void main(String[] args) {
04.        // insert code here
05.        set.add(new Integer(2));
06.        set.add(new Integer(1));
07.        System.out.println(set);
08.    }
09. }
```

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();`

Correct Answer: A

QUESTION 36
Given:

```
05. class A {
06.    void foo() throws Exception { throw new Exception(); }
07. }
08. class SubB2 extends A {
09.    void foo() { System.out.println("B "); }
10. }
11. class Tester {
12.    public static void main(String[] args) {
13.        A a = new SubB2();
14.        a.foo();
15.    }
16. }
```

What is the result?

A. B
B. B, followed by an Exception.
C. Compilation fails due to an error on line 9.
D. Compilation fails due to an error on line 14.
E. An Exception is thrown with no other output.

Correct Answer: D

QUESTION 37
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.

Correct Answer: C

QUESTION 38
Given:

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

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

What is the result?

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

Correct Answer: G

QUESTION 39
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.

Correct Answer: G

QUESTION 40
Given:

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

What is the result?

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

Correct Answer: C

QUESTION 41
Given:

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

What is the result?

A. 6
B. 7
C. 10
D. 11
E. Compilation fails.
F. An exception is thrown at runtime.

Correct Answer: E

QUESTION 42
Given:

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

What is the result?

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

Correct Answer: A

QUESTION 43
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.

Correct Answer: A

QUESTION 44
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

Correct Answer: D

QUESTION 45
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); }
```

Correct Answer: DF

QUESTION 46
Given:

```
04. public class Tahiti {
05.     Tahiti t;
06.
07.     public static void main(String[] args) {
08.         Tahiti t = new Tahiti();
09.         Tahiti t2 = t.go(t);
10.         t2 = null;
11.         // more code here
12.     }
13.
14.     Tahiti go(Tahiti t) {
15.         Tahiti t1 = new Tahiti();
16.         Tahiti t2 = new Tahiti();
17.         t1.t = t2;
18.         t2.t = t1;
19.         t.t = t2;
20.         return t1;
21.     }
22. }
```

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

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

Correct Answer: A

QUESTION 47
Given:

```
12. public class Commander {
13.     public static void main(String[] args) {
14.         String myProp = /* insert code here */
15.         System.out.println(myProp);
16.     }
17. }
```

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");`

Correct Answer: DE

QUESTION 48
Given:

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

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

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

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

What is the result?

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

Correct Answer: A

QUESTION 49
A developer is creating a class Book, that needs to access class Paper. The Paper class is deployed in a JAR named myLib.jar. Which three, taken independently, will allow the developer to use the Paper class while compiling the Book class? (Choose three.)

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

Correct Answer: BDG

QUESTION 50
Click the Exhibit button.

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

public class Gamma {
```

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

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

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

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

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

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

Correct Answer: B

QUESTION 51
Given classes defined in two different files:

```
package packageA;
public class Message {
    String getText() {
        return "text";
    }
}
```

And:

```
package packageB;
public class XMLMessage extends packageA.Message {
    String getText() {
        return "<msg>text</msg>";
    }

    public static void main(String[] args) {
        System.out.println(new XMLMessage().getText());
    }
}
```

What is the result of executing XMLMessage.main?

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

Correct Answer: C

QUESTION 52
Given:

```
interface Fish {
}

class Perch implements Fish {
}

class Walleye extends Perch {
}

class Bluegill {
}

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

What is the result?

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

Correct Answer: B

QUESTION 53
Given:

```
package com.company.application;

public class MainClass {
    public static void main(String[] args) {
    }
}
```

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

Correct Answer: BC

QUESTION 54
Given

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

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

Which two statements are true? (Choose two.)

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

Correct Answer: BC

QUESTION 55
Given:

```
public class TestSeven extends Thread {
    private static int x;
    public synchronized void doThings() {
        int current = x;
        current++;
        x = current;
    }
    public void run() {
        doThings();
    }
}
```

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.

Correct Answer: E

QUESTION 56
Given that the current directory is empty, and that the user has read and write privileges to the current directory, and the following:

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

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.

Correct Answer: B

QUESTION 57
Given:

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

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

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

Correct Answer: CF

QUESTION 58
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.

Correct Answer: BDE

QUESTION 59
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.

Correct Answer: D

QUESTION 60
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.

Correct Answer: A