

1. What will be the output of the program?

```
classA
{
    finalpublicintGetResult(int a, int b) { return0; }
}
classBextendsA
{
    publicintGetResult(int a, int b) {return1; }
}
publicclassTest
{
    publicstaticvoid main(String args[])
    {
        B b = new B();
        System.out.println("x = " + b.GetResult(0, 1));
    }
}
```

- A. x = 0
- B. x = 1
- C. Compilation fails.
- D. An exception is thrown at runtime.

Answer: Option C

Explanation:

The code doesn't compile because the method GetResult() in class A is final and so cannot be overridden.

2. What will be the output of the program?

```
classSC2
{
    publicstaticvoid main(String [] args)
    {
        SC2 s = new SC2();
        s.start();
    }

    void start()
    {
        int a = 3;
        int b = 4;
        System.out.print(" " + 7 + 2 + " ");
        System.out.print(a + b);
        System.out.print(" " + a + b + " ");
        System.out.print(foo() + a + b + " ");
        System.out.println(a + b + foo());
    }
}
```

```

}

String foo()
{
    return"foo";
}
}

```

- A. 9 7 7 foo 7 7foo
- B. 72 34 34 foo34 34foo
- C. 9 7 7 foo34 34foo
- D. 72 7 34 foo34 7foo

Answer: Option D

Explanation:

Because all of these expressions use the + operator, there is no precedence to worry about and all of the expressions will be evaluated from left to right. If either operand being evaluated is a String, the + operator will concatenate the two operands; if both operands are numeric, the + operator will add the two operands.

3. What will be the output of the program?

```

class BoolArray
{
    boolean [] b = new boolean[3];
    int count = 0;

    void set(boolean [] x, inti)
    {
        x[i] = true;
        ++count;
    }

    public static void main(String [] args)
    {
        BoolArray ba = new BoolArray();
        ba.set(ba.b, 0);
        ba.set(ba.b, 2);
        ba.test();
    }

    void test()
    {
        if ( b[0] && b[1] | b[2] )
            count++;
        if ( b[1] && b[(++count - 2)] )
            count += 7;
        System.out.println("count = " + count);
    }
}

```

```
}  
}
```

A. count = 0

B. count = 2

C. count = 3

D. count = 4

Answer: Option C

Explanation:

The reference variables b and x both refer to the same boolean array. count is incremented for each call to the set() method, and once again when the first if test istrue. Because of the && short circuit operator, count is not incremented during the second if test.

4. Which two statements are equivalent?

1. $3/2$
2. $3 < 2$
3. $3 * 4$
4. $3 \ll 2$

A. 1 and 2

B. 2 and 3

C. 3 and 4

D. 1 and 4

Answer: Option C

Explanation:

(1) is wrong. $3/2 = 1$ (integer arithmetic).

(2) is wrong. $3 < 2 = \text{false}$.

(3) is correct. $3 * 4 = 12$.

(4) is correct. $3 \ll 2 = 12$. In binary 3 is 11, now shift the bits two places to the left and we get 1100 which is 12 in binary ($3 * 2 * 2$).

```
5. public void foo( boolean a, boolean b)  
{  
    if( a )  
    {  
        System.out.println("A"); /* Line 5 */  
    }  
    elseif(a && b) /* Line 7 */  
    {  
        System.out.println( "A && B");  
    }  
    else /* Line 11 */  
    {
```

```
    if ( !b )
    {
        System.out.println( "notB" );
    }
    else
    {
        System.out.println( "ELSE" );
    }
}
}
```

- A. If a is true and b is true then the output is "A && B"
- B. If a is true and b is false then the output is "notB"
- C. If a is false and b is true then the output is "ELSE"
- D. If a is false and b is false then the output is "ELSE"

Answer: Option C

Explanation:

Option C is correct. The output is "ELSE". Only when a is false do the output lines after 11 get some chance of executing.

Option A is wrong. The output is "A". When a is true, irrespective of the value of b, only the line 5 output will be executed. The condition at line 7 will never be evaluated (when a is true it will always be trapped by the line 12 condition) therefore the output will never be "A && B".

Option B is wrong. The output is "A". When a is true, irrespective of the value of b, only the line 5 output will be executed.

Option D is wrong. The output is "notB".

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6. What will be the output of the program?

```
Float f = new Float("12");
switch (f)
{
    case12: System.out.println("Twelve");
    case0: System.out.println("Zero");
    default: System.out.println("Default");
}
```

- A. Zero
- B. Twelve
- C. Default
- D. Compilation fails

Answer: Option D

Explanation:

The switch statement can only be supported by integers or variables more "narrow" than an integer i.e. byte, char, short. Here a Float wrapper object is used and so the compilation fails.

7. What will be the output of the program?

```
publicclassTest
{
    publicstaticvoidaMethod() throws Exception
    {
        try/* Line 5 */
        {
            thrownew Exception(); /* Line 7 */
        }
        finally/* Line 9 */
        {
            System.out.print("finally "); /* Line 11 */
        }
    }
    publicstaticvoid main(String args[])
    {
        try
        {
            aMethod();
        }
        catch (Exception e) /* Line 20 */
        {
            System.out.print("exception ");
        }
        System.out.print("finished"); /* Line 24 */
    }
}
```

- A. finally
- B. exception finished
- C. finally exception finished
- D. Compilation fails

Answer: Option C

Explanation:

This is what happens:

- (1) The execution of the try block (line 5) completes abruptly because of the throwstatement (line 7).
- (2) The exception cannot be assigned to the parameter of any catch clause of the trystatement therefore the finally block is executed (line 9) and "finally" is output (line 11).

(3) The finally block completes normally, and then the try statement completes abruptly because of the throw statement (line 7).

(4) The exception is propagated up the call stack and is caught by the catch in the main method (line 20). This prints "exception".

(5) Lastly program execution continues, because the exception has been caught, and "finished" is output (line 24).

8. Which statement is true for the class `java.util.ArrayList`?

- A. The elements in the collection are ordered.
- B. The collection is guaranteed to be immutable.
- C. The elements in the collection are guaranteed to be unique.
- D. The elements in the collection are accessed using a unique key.

Answer: Option A

Explanation:

Yes, always the elements in the collection are ordered.

9. Which is true about a method-local inner class?

- A. It must be marked final.
- B. It can be marked abstract.
- C. It can be marked public.
- D. It can be marked static.

Answer: Option B

Explanation:

Option B is correct because a method-local inner class can be abstract, although it means a subclass of the inner class must be created if the abstract class is to be used (so an abstract method-local inner class is probably not useful).

Option A is incorrect because a method-local inner class does not have to be declared final (although it is legal to do so).

C and D are incorrect because a method-local inner class cannot be made public (remember-you cannot mark any local variables as public), or static.

```
10. classXimplementsRunnable
    {
        publicstaticvoid main(String args[])
```

```
{
  /* Missing code? */
}
public void run() {}
}
```

Which of the following line of code is suitable to start a thread ?

- A. Thread t = new Thread(X);
- B. Thread t = new Thread(X); t.start();
- C. X run = new X(); Thread t = new Thread(run); t.start();
- D. Thread t = new Thread(); x.run();

Answer: Option C

Explanation:

Option C is suitable to start a thread.

11. What will be the output of the program?

```
class MyThread extends Thread
{
  public static void main(String [] args)
  {
    MyThread t = new MyThread();
    t.start();
    System.out.print("one. ");
    t.start();
    System.out.print("two. ");
  }
  public void run()
  {
    System.out.print("Thread ");
  }
}
```

- A. Compilation fails
- B. An exception occurs at runtime.
- C. It prints "Thread one. Thread two."
- D. The output cannot be determined.

Answer: Option B

Explanation:

When the start() method is attempted a second time on a single Thread object, the method will throw an IllegalStateException (you will not need to know this exception name for the exam). Even if the thread has finished running, it is still illegal to call start() again.

12. What will be the output of the program?

```
class MyThread extends Thread
{
    MyThread() {}
    MyThread(Runnable r) {super(r); }
    public void run()
    {
        System.out.print("Inside Thread ");
    }
}
class MyRunnable implements Runnable
{
    public void run()
    {
        System.out.print(" Inside Runnable");
    }
}
class Test
{
    public static void main(String[] args)
    {
        new MyThread().start();
        new MyThread(new MyRunnable()).start();
    }
}
```

- A. Prints "Inside Thread Inside Thread"
- B. Prints "Inside Thread Inside Runnable"
- C. Does not compile
- D. Throws exception at runtime

Answer: Option A

Explanation:

If a Runnable object is passed to the Thread constructor, then the run method of the Thread class will invoke the run method of the Runnable object.

In this case, however, the run method in the Thread class is overridden by the run method in MyThread class. Therefore the run() method in MyRunnable is never invoked.

Both times, the run() method in MyThread is invoked instead.

13. What will be the output of the program?


```

class implements Runnable
{
    int x, y;
    public void run()
    {
        for(int i = 0; i < 1000; i++)
            synchronized(this)
            {
                x = 12;
                y = 12;
            }
        System.out.print(x + " " + y + " ");
    }
    public static void main(String args[])
    {
        s run = new s();
        Thread t1 = new Thread(run);
        Thread t2 = new Thread(run);
        t1.start();
        t2.start();
    }
}

```

- A. DeadLock
- B. It print 12 12 12 12
- C. Compilation Error
- D. Cannot determine output.

Answer: Option B

Explanation:

The program will execute without any problems and print 12 12 12 12.

```

14. public class Test
{
    public void foo()
    {
        assert false; /* Line 5 */
        assert false; /* Line 6 */
    }
    public void bar()
    {
        while(true)
        {
            assert false; /* Line 12 */
        }
        assert false; /* Line 14 */
    }
}

```

What causes compilation to fail?

- A. Line 5

- B. Line 6
- C. Line 12
- D. Line 14

Answer: Option D

Explanation:

Option D is correct. Compilation fails because of an unreachable statement at line 14. It is a compile-time error if a statement cannot be executed because it is unreachable. The question is now, why is line 20 unreachable? If it is because of the assert then surely line 6 would also be unreachable. The answer must be something other than assert.

Examine the following:

A while statement can complete normally if and only if at least one of the following is true:

- The while statement is reachable and the condition expression is not a constant expression with value true.
- There is a reachable break statement that exits the while statement.

The while statement at line 11 is infinite and there is no break statement therefore line 14 is unreachable. You can test this with the following code:

```
publicclassTest80
{
    publicvoid foo()
    {
        assertfalse;
        assertfalse;
    }
    publicvoid bar()
    {
        while(true)
        {
            assertfalse;
            break;
        }
        assertfalse;
    }
}
```

15. What will be the output of the program?

```
publicclassTest
{
    publicstaticint y;
    publicstaticvoid foo(int x)
    {
```

```

    System.out.print("foo ");
    y = x;
}
public static int bar(int z)
{
    System.out.print("bar ");
    return y = z;
}
public static void main(String [] args )
{
    int t = 0;
    assert t > 0 : bar(7);
    assert t > 1 : foo(8); /* Line 18 */
    System.out.println("done ");
}
}

```

- A. bar
- B. bar done
- C. foo done
- D. Compilation fails

Answer: Option D

Explanation:

The foo() method returns void. It is a perfectly acceptable method, but because it returns void it cannot be used in an assert statement, so line 18 will not compile.

16. Which of the following statements is true?

- A. In an assert statement, the expression after the colon (:) can be any Java expression.
- B. If a switch block has no default, adding an assert default is considered appropriate.
- C. In an assert statement, if the expression after the colon (:) does not have a value, the assert's error message will be empty.
- D. It is appropriate to handle assertion failures using a catch clause.

Answer: Option B

Explanation:

Adding an assertion statement to a switch statement that previously had no default case is considered an excellent use of the assert mechanism.

Option A is incorrect because only Java expressions that return a value can be used. For instance, a

method that returns void is illegal.

Option C is incorrect because the expression after the colon must have a value.

Option D is incorrect because assertions throw errors and not exceptions, and assertion errors do cause program termination and should not be handled.

```
17. publicclassTest2
{
    publicstaticint x;
    publicstaticint foo(int y)
    {
        return y * 2;
    }
    publicstaticvoid main(String [] args)
    {
        int z = 5;
        assert z >0; /* Line 11 */
        assert z >2: foo(z); /* Line 12 */
        if ( z <7 )
            assert z >4; /* Line 14 */

        switch (z)
        {
            case4: System.out.println("4 ");
            case5: System.out.println("5 ");
            default: assert z <10;
        }

        if ( z <10 )
            assert z >4: z++; /* Line 22 */
            System.out.println(z);
        }
    }
}
```

which line is an example of an inappropriate use of assertions?

- A. Line 11
- B. Line 12
- C. Line 14
- D. Line 22

Answer: Option D

Explanation:

Assert statements should not cause side effects. Line 22 changes the value of z if the assert statement is false.

Option A is fine; a second expression in an assert statement is not required.

Option B is fine because it is perfectly acceptable to call a method with the second expression of an assert statement.

Option C is fine because it is proper to call an assert statement conditionally.

18. What will be the output of the program?

```
publicclassNFE
{
    publicstaticvoid main(String [] args)
    {
        String s = "42";
        try
        {
            s = s.concat(".5"); /* Line 8 */
            double d = Double.parseDouble(s);
            s = Double.toString(d);
            int x = (int) Math.ceil(Double.valueOf(s).doubleValue());
            System.out.println(x);
        }
        catch (NumberFormatException e)
        {
            System.out.println("bad number");
        }
    }
}
```

- A. 42
- B. 42.5
- C. 43
- D. bad number

Answer: Option C

Explanation:

All of this code is legal, and line 8 creates a new String with a value of "42.5". Lines 9 and 10 convert the String to a double and then back again. Line 11 is funâ€™Math.ceil()'s argument expression is evaluated first. We invoke the valueOf()method that returns an anonymous Double object (with a value of 42.5). Then thedoubleValue() method is called (invoked on the newly created Double object), and returns a double primitive (there and back again), with a value of (you guessed it) 42.5.

The ceil() method converts this to 43.0, which is cast to an int and assigned to x.

19. What will be the output of the program?

```
publicclassTest138
{
    publicstaticvoidstringReplace (String text)
    {
        text = text.replace ('j' , 'c'); /* Line 5 */
    }
}
```

```

publicstaticvoidbufferReplace (StringBuffer text)
{
    text = text.append ("c"); /* Line 9 */
}
publicstaticvoid main (String args[])
{
    String textString = new String ("java");
    StringBuffertextBuffer = newStringBuffer ("java"); /* Line 14 */
    stringReplace(textString);
    bufferReplace(textBuffer);
    System.out.println (textString + textBuffer);
}
}

```

- A. java
- B. javac
- C. javajavac
- D. Compile error

Answer: Option C

Explanation:

A string is immutable, it cannot be changed, that's the reason for the StringBufferclass. The stringReplace method does not change the string declared on line 14, so this remains set to "java".

Method parameters are always passed by value - a copy is passed into the method - if the copy changes, the original remains intact, line 5 changes the reference i.e. text points to a new String object, however this is lost when the method completes. The textBuffer is a StringBuffer so it can be changed.

This change is carried out on line 9, so "java" becomes "javac", the text reference on line 9 remains unchanged. This gives us the output of "javajavac"

20. What will be the output of the program (in jdk1.6 or above)?

```

publicclassBoolTest
{
    publicstaticvoid main(String [] args)
    {
        Boolean b1 = new Boolean("false");
        boolean b2;
        b2 = b1.booleanValue();
        if (!b2)
        {
            b2 = true;
            System.out.print("x ");
        }
        if (b1 & b2) /* Line 13 */
    }
}

```

```
{  
    System.out.print("y ");  
}  
System.out.println("z");  
}
```

- A. z
- B. x z
- C. y z
- D. Compilation fails.

Answer: Option B
