



University College Dublin  
An Coláiste Ollscoile, Baile Átha Cliath

**Professional Java Programming Part 1 (COMP41600) Exam, 30 October 2012**

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**NAME:** \_\_\_\_\_

**STUDENT NUMBER:** \_\_\_\_\_

***Instructions:***

**Answer ALL 30 questions. Clearly mark your choice(s) for each question on this exam paper. If you want to change your answer, please ensure that your final choice(s) is/are clearly marked.**

**Do NOT detach pages from this exam, and do NOT add anything - only your indicated choices will be marked, there is no need to provide any explanation.**

**This is a closed-book exam. You may bring some blank sheets into the exam (for rough work) but you should NOT submit them with your exam answers.**

**Time allowed: 90 minutes.**

1. What is the value of x after the following operation is performed: `int x = 15%(-2);`

- A. 7
- B. -7
- C. -1
- D. 1

2. Given the following code, what is the expected outcome?

```
1. package mail;
2.
3. interface Box {
4.     abstract void open();
5.     public final void close();
6. }
```

- A. The code will not compile because of line 4.
- B. The code will not compile because of line 5.
- C. The code will not compile for some other reason.
- D. The code will compile.

3. An array in Java is an object, regardless of whether its array variables are primitive data types or object references.

- A. True
- B. False

**4. Consider the following piece of code:**

```
1.  short shortVar = 1;
2.  int intVar = 1;
3.  intVar = shortVar + 1;
4.  System.out.println ("The value of intVar: " + intVar);
5.  System.out.println ("The value of shortVar: " + shortVar);
```

**What is the result?**

- A.     The value of intVar: 1  
        The value of shortVar: 1
- B.     The value of intVar: 2  
        The value of shortVar: 1
- C.     This piece of code would not compile because of line 1
- D.     This piece of code would not compile because of line 3

**5. Which of the following modifiers can be applied to a nested class? (Choose all that apply)**

- A.     public
- B.     protected
- C.     private
- D.     static

6. Consider the following code:

```
1. class MySuperClass {
2.     MySuperClass() {
3.         System.out.println("Superclass!");
4.     }
5.     protected void message() {
6.         System.out.println("From the superclass!");
7.     }
8. }
9. public class MySubClass extends MySuperClass {
10.     MySubClass() {
11.     }
12.     void message() {
13.         System.out.println("From the subclass!");
14.     }
15.     public static void main(String args[]) {
16.         MySubClass mysub = new MySubClass();
17.         mysub.message();
18.     }
19. }
```

Which one of the following statements is true about this code?

- A. The code would compile and execute, and generate the output:  
Superclass!  
From the superclass!
- B. The code would compile and execute, and generate the output:  
Superclass!  
From the subclass!
- C. Line 12 would generate a compiler error.
- D. Line 17 would generate a compiler error.

7. Consider the following piece of code:

```
1. OuterLoop: for (int i = 1; i < 3; i++) {  
2.   for ( int j = 0; j < 3; j++) {  
3.     if ( i == j ) {  
4.       continue OuterLoop;  
5.     }  
6.     System.out.println ( " i = " + i + ", j = " + j );  
7.   }  
8. }
```

Which of the following would be part of the output? (Choose all that apply)

- A. i = 1, j = 0
- B. i = 1, j = 1
- C. i = 2, j = 1
- D. i = 2, j = 2

8. What range of values is represented by an `int`?

- A.  $-2^{63}$  to  $2^{63}-1$
- B.  $-2^{31}$  to  $2^{31}-1$
- C.  $-2^{15}$  to  $2^{15}-1$
- D. The exact range is given in the IEEE 754 specification.

9. What is the output when you try to compile and run the following code?

```
public class MyClass{  
    int i;  
    public static void main(String[] args){  
        System.out.println(i);  
    }  
}
```

- A. no output – compiler error
- B. 0
- C. i

10. What is the output of the following program?

```
class Q10 {  
    public static void main(String[] args) {  
        long i=0L;  
        switch(i) {  
            case 1:  
                System.out.println("one");  
            case 2:  
                System.out.println("two");  
            case 3:  
                System.out.println("three");  
        }  
    }  
}
```

- A. one  
two  
three
- B. compiles, but produces no output when executed
- C. compiler error

11. Which of the following are valid variable names in Java? (Choose all that apply)

- A. static
- B. mystatic
- C. 2static
- D. \_static

12. After execution of the following code fragment, what is the value of the variable `x`?

```
int x, a = 8, b = 7;  
  
x = (++a) - (b++);
```

- A. 0
- B. 1
- C. 2

13. Which of the following restrictions apply to *anonymous inner classes*? (Choose all that apply)

- A. They must be defined inside a code block.
- B. They may only read and write **final** variables of the enclosing class.
- C. They may only call **final** methods of the enclosing class.
- D. They may not call the enclosing class's **synchronized** methods.

**14. Consider the following class definition:**

```
public class Test extends Base {  
    public Test() {  
    }  
    public Test(int j, int k, int t) {  
        super(j, k, t);  
    }  
}
```

**Which of the following are legal calls to construct instances of the Test class? (Choose all that apply)**

- A. Test t = new Test();
- B. Test t = new Test(1, -1);
- C. Test t = new Test(1, -1, 0);
- D. Test t = new Test(1, -1, 0, 0);

**15. A class declared inside a method cannot be marked with any access modifier.**

- A. True
- B. False

**16. Consider the following code:**

```
public class MyOuterClass {  
    public class MyNestedClass { }  
}
```

**Which of the following is a correct statement to instantiate MyNestedClass from a class outside of MyOuterClass? (Choose all that apply)**

- A. MyNestedClass mn = new MyOuterClass.MyNestedClass();
- B. MyOuterClass.MyNestedClass mn = new MyOuterClass.MyNestedClass();
- C. MyOuterClass.MyNestedClass mn = new MyNestedClass();
- D. MyOuterClass mo = new MyOuterClass();  
 MyOuterClass.MyNestedClass mn = mo.new MyNestedClass();



**17. After executing the line of code: `int[] x = new int[10];` which of the following statements are true? (Choose all that apply)**

- A. `x[0]` is 0
- B. `x[0]` is undefined
- C. `x[9]` is 0
- D. `x[9]` is undefined

**18. Which one of the following statements is false?**

- A. If you do not define a no-arguments constructor in a class, the Java compiler will provide a no-arguments constructor.
- B. From inside a constructor of a class, you can call a constructor of the superclass.
- C. The constructor of a superclass is not inherited by its subclass.

19. What is the output of the following code?

```
1.class StaticExample {
2.    static int staticCounter=1;
3.    int counter=1;
4.    StaticExample() {
5.        staticCounter++;
6.        counter++;
7.    }
8. }
9. class RunStaticExample {
10. public static void main(String[] args) {
11.     StaticExample se1 = new StaticExample();
12.     StaticExample se2 = new StaticExample();
13.     System.out.println("Value of staticCounter for se1: " +
14.         se1.staticCounter);
15.     System.out.println("Value of counter for se1: " + se1.counter);
16. }
```

A.

Value of staticCounter for se1: 2

Value of counter for se1: 3

B.

Value of staticCounter for se1: 1

Value of counter for se1: 2

C.

Value of staticCounter for se1: 3

Value of counter for se1: 3

D.

Value of staticCounter for se1: 3

Value of counter for se1: 2

20. Given that the following code works correctly, what are the possible types of variable `c`?

```
short a = 10;  
short b = 2;  
c = a * b;
```

- A. short, int, long
- B. short, int, long, float, double
- C. int, long, float, double
- D. None of the above

21. Which of the following may *override* a method whose signature is `void aMethod(float f)`? (Choose all that apply)

- A. `void aMethod(float f)`
- B. `public void aMethod(float f)`
- C. `private void aMethod(float f)`
- D. `int aMethod(float f)`

22. Both object references and primitive datatypes may be converted implicitly and explicitly in Java.

- A. True
- B. False

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

- A. All enum types are subclasses of the Java class **Enum**.
- B. An enum may have methods.
- C. An enum may be extended.
- D. An enum may be declared inside a class.

**24. Which one of the following statements is true?**

- A. Polymorphism represents a has-a relationship between objects.
- B. Inheritance represents a has-a relationship between objects.
- C. Class membership represents a has-a relationship between objects.
- D. Association represents a has-a relationship between objects.

**25. Why might you define a method as **native** in Java?**

- A. To prevent the method's variables from being serialized
- B. To write the method implementation in another language, such as C/C++
- C. You cannot define a method as **native** in Java – only variables can be declared **native**

26. You have been given a design document for implementation in Java. It states: "A Bank has employees and customers. A BadBank is a Bank that has a total amount of badDebts and a flag that indicates whether it is solvent or not". You can assume that the Bank class has already been defined.

Which of the following data members would be appropriate to include in the class BadBank?

- A. `double badDebts;`
- B. `int solvent;`
- C. `boolean solvent;`
- D. `Customer [] customer;`

27. What is the output from this code fragment?

```
1. int x = 0, y = 9, z = 5;
2. if (x <= -3) {
3.     if (y < 10) {
4.         System.out.println("message one");
5.     }
6. } else {
7.     System.out.println("message two");
8. }
9. }
10. else if (z >= 5) {
11.     System.out.println("message three");
12. }
13. else {
14.     System.out.println("message four");
15. }
```

- A. message one
- B. message two
- C. message three
- D. message four

**28. Consider the following code fragment:**

```
1    int i = 1;
2    do
3    {
4        i--;
5        System.out.println("I am in the do block.");
6    } while( i <= 0);
```

**What would be the output from this code fragment?**

- A. Infinite loop, with each iteration producing the output: I am in the do block.
- B. Outputs: I am in the do block.
- C. No output: a compiler error occurs at line 6.
- D. It compiles and runs but produces no output.

**29. The following construct is legal in Java:**

```
for (i=0, j=1; i+j<5; i++, j++){}
```

- A. True
- B. False

**30. Which of the following statements is true about a variable created with the `static` modifier?  
(Choose all that apply)**

- A. Once assigned, the value of a static variable may not be altered.
- B. The static variable can be accessed using the class name as well as its object's name.
- C. Only one instance of a static variable will exist for any amount of class instances.
- D. The static modifier can only be applied to a primitive value.