Systems Programming
(English group)

Leganés, March 15, 2019 — First midterm exam (test)
Duration: 20 min — Score: 3 points out of 10 in the exam

There is only one correct option for each question. Each correct answer adds 0.3 points. Each incorrect answer subtracts 0.1 points. Unanswered questions do not add or subtract points.

- Mark the answer to each question with an "X" in the table below.
- If there is no "X" in a question or you mark more than one option, the question is considered unanswered.
- Complete **your personal information** before starting the exam.

Name:	Group:

Signature:

NIA:

	A	B	C	D		A	B	C	D
1					6				
2					7				
3					8				
4					9				
5					10				

1.- Given the following code, what is printed on screen?

```
public class P {
    private int[] array;
    public static void main(String[] args){
        P p = new P();
        for (int i = 0; i <= p.array.length; i++){
            System.out.println(p.array[i]);
        }
    }
}
```

(a) *** A *NullPointerException* is thrown

(b) 0

(c) *null*

(d) An *ArrayIndexOutOfBoundsException* is thrown

2.- We are given the following code in two separate classes, what does it print on screen?

```
public class P {
    protected static int p;
    public P(){
        p++;
    }
}
public class H extends P{
    protected static int h;
    public H() {
        h++;
    }
    public static void main(String[] args){
        P a = new P();
        H b = new H();
        System.out.println(p + h);
    }
}
```

(a) *** 3

(b) 2

(c) 0

(d) There is a compilation error and the program cannot be executed

3.- Methods defined as *final*...

(a) *** Cannot be overridden in subclases

(b) Can only be private

(c) Make use of constants

(d) Cannot receive arguments

4.- Given classes *C1* and *C2* and interfaces *I1* and *I2*, which of these statements is correct?

(a) *** public abstract class C1 implements I1

(b) public interface I1 extends C1

(c) public class C1 extends abstract class C2

(d) public abstract interface I1 extends I2

5.- Given non-abstract class A, its abstract child class B, and non-abstract class C which extends from B, all of them implementing a constructor which does not receive any parameters, indicate the statement which causes a runtime error:

(a) *** C c = (C) new A();

(b) C c = (B) new B();

(c) B b = new A();

(d) B b = new C();

6.- Considering the following code...

```
public class C{
    public static void main(String[] args) {
        method();
    }
    private static void method() {
    }
}
```

(a) *** The code is correct.

(b) The code gives a compilation error because a static method cannot be called from another static method.

(c) The code gives a compilation error because we need to create an object of class C, before calling *method()* in *main()*.

(d) The code gives a compilation error because *method()* is not visible from *main()* since *method()* is a private method.

7.- Which of the following statements on method overloading and method overriding is correct?

(a) *** Constructors can be overloaded but not overriden

(b) For method overriding to happen at least one class is needed, while for method overloading to happen at least two classes are needed.

(c) Abstract classes cannot overload methods.

(d) Abstract classes cannot override methods.

8.- Let *protected int i* be an attribute of an A class. Let B be a class extending A. Choose the correct answer:

(a) *** It is possible to directly modify the value of the i from B.

(b) The value of the i can only be read from A.

(c) The value of the i can be read but not modified from B.

(d) In order to read the value of the i from B, *super* must be used.

9.- Given the following class and its test class, which is the branch coverage achieved?

```
public class A {
    public boolean a(int a) {
        if (a <= 0) {
            return false;
        } else if (a > 100) {
            return false;
        } else
            return true;
    }
}

public class ATest {
    A a;
    @BeforeEach
    public void setUp() throws Exception {
        a = new A();
    }

    @Test
    public void testA() {
        assertTrue(a.a(10));
        assertFalse(a.a(0));
    }
}
```

(a) *** 75 %

(b) 25 %

(c) 50 %

(d) 100 %

10.- We are given a method which calculates the arccosine of a value received as parameter, *double acos(double a)*, and for which we want to carry out black-box testing. Select the set of values that allow testing all the equivalence classes for this method.

(a) *** -2, 0, and 2

(b) -5 and 5

(c) -1, 0, and 1

(d) 0 and 0.5