Question 1. (2 pt) For each sentence, please indicate if it is right or wrong:

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<thead>
<tr>
<th>True</th>
<th>False</th>
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Question 2. (1 pt)
Consider the following classes and indicate the correct answer (there might be several correct answers):

```java
package fr.esial;

public class TestVisibility {
    public int j;
    protected int k;
    private int l;
}
```

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Question 3. (1 pt)
Consider the following classes and indicate the correct answer:

```java
class Shape {
    private String color;
    public Shape(String color) {
        System.out.print("Shape");
        this.color = color;
    }
}

class Rectangle extends Shape {
    public Rectangle() {
        System.out.print("Rectangle");
    }
}

class TestConstructor {
    public static void main(String[] args) {
        new Rectangle();
    }
}
```

| ☐ | ☐ | This code does not compile (error at line 4). |
| ☐ | ☐ | This code does not compile (error at line 11). |
| ☐ | ☐ | This code compiles and the program output is : Shape |
| ☐ | ☐ | This code compiles and the program output is : Rectangle |
| ☐ | ☐ | This code compiles and the program output is : ShapeRectangle |
| ☐ | ☐ | This code compiles and the program output is : RectangleShape |

Question 4. (1 pt)
Consider the following classes and indicate the correct answer:

```java
class Parent {
    public Parent() {
        System.out.print("A");
    }
}

class Child extends Parent {
    public Child(int x) {
        System.out.print("B");
    }
    public Child() {
        System.out.print("C");
    }
}

class TestConstructor2 {
    public static void main(String[] args) {
        new Child();
    }
}
```

| ☐ | ☐ | This code does not compile (error at line 7). |
| ☐ | ☐ | This code does not compile (error at line 11). |
| ☐ | ☐ | This code compiles and the program output is : ACB |
| ☐ | ☐ | This code compiles and the program output is : ABC |
| ☐ | ☐ | This code compiles and the program output is : BC |
| ☐ | ☐ | This code compiles and the program output is : AC |
Question 5. (1 pt)
Consider the following classes and indicate the correct answer:

```java
public class WhatAMess {
    public static void main(String[] args) {
        System.out.print("1");
        try {
            System.out.print("2");
            if (true) throw new Exception();
            System.out.print("3");
        } catch (Exception e) {
            try {
                System.out.print("4");
                if (true) throw new Exception();
                System.out.print("5");
            } catch (Exception ex) {
                try {
                    System.out.print("6");
                    if (false) throw new Exception();
                    System.out.print("7");
                } catch (Exception ex2) {
                    System.out.print("8");
                } finally {
                    System.out.print("9");
                }
            } finally {
                System.out.print("A");
            }
        }
    }
}
```

- This code compiles and the program output is: 1
- This code compiles and the program output is: 123
- This code compiles and the program output is: 12467B
- This code compiles and the program output is: 124679AB

Question 6. (2 pt)
Consider the following classes and indicate the correct answer (there might be several correct answers) when the provided instructions are inserted at line 19. If there is no error then please indicate the program output.

```java
class Animal {
    public void eat() {
        System.out.println("Generic animal eating");
    }
}

class Horse extends Animal {
    public void eat() {
        System.out.println("Horse eating hay");
    }
    public void eat(String meal) {
        System.out.println("Horse eating "+meal);
    }
}

class Farm {
    public static void main(String[] args) {
        // insert instructions here
    }
}
```

<table>
<thead>
<tr>
<th>Error (compilation)</th>
<th>Error (execution)</th>
<th>Ok</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal a = new Animal(); a.eat();</td>
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<tr>
<td>Horse h = new Horse(); h.eat();</td>
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<tr>
<td>Animal ah = new Horse(); ah.eat();</td>
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<tr>
<td>Horse ha = new Animal(); ha.eat();</td>
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<tr>
<td>Horse he = new Horse(); he.eat(&quot;apples&quot;);</td>
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<tr>
<td>Animal a2 = new Animal(); a2.eat(&quot;treats&quot;);</td>
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<tr>
<td>Animal ah2 = new Horse(); ah2.eat(&quot;carrots&quot;);</td>
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<tr>
<td>Animal ah3 = new Horse(); ((Horse) ah3).eat(&quot;cabbage&quot;);</td>
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</table>
Question 7. (1 pt)

Consider the following classes and indicate the correct answer:

```java
class Car {
    public static int velocity = 100;
}

public class TestDrive {
    public static void accelerate(Car c) {
        c.velocity += 30;
    }
    public static void main(String[] args) {
        Car lamborghini = new Car();
        accelerate(lamborghini);
        Car gt500 = new Car();
        accelerate(gt500);
        System.out.println("speed=\"+gt500.velocity);"
    }
}
```

- This code compiles and the program output is: speed=100
- This code compiles and the program output is: speed=130
- This code compiles and the program output is: speed=160

Question 8. (2 pt)

Consider the following classes and indicate the correct answer (there might be several correct answers) when the provided instructions are inserted at line 25. If there is no error then please indicate the program output.

```java
class Bidule {
    void bipbip(Bidule x) {
        System.out.println("bipbip de Bidule");
    }
    void coincoin(Bidule x) {
        System.out.println("coincoin de Bidule");
    }
}

class Machin extends Bidule {
    void bipbip(Bidule x) {
        System.out.println("bipbip de Machin");
    }
    void coincoin(Machin x) {
        System.out.println("coincoin de Machin");
    }
}

class Test {
    public static void main(String[] argv) {
        Bidule x = new Machin();
        Machin y = new Machin();
        Bidule z = new Bidule();
        // replace here
    }
}
```

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package pizza;

class Main {
    public static void main(String[] args) {
        Pizza mg = new Pizza("Marguerita");
        Ingredient tom = new Ingredient("Tomatoes", 150);
        mg.addIngredient(tom);
        Ingredient mozz = new Ingredient("Mozzarella", 100);
        mg.addIngredient(mozz);
        Pizza mg2 = new Pizza("Marguerita");
        mg2.addIngredient(new Ingredient("Mozzarella", 100));
        mg2.addIngredient(new Ingredient("Tomatoes", 150));
        System.out.println("POINT 1");
        System.out.println(mg);
        System.out.println(mg2);
        System.out.println(ingFromMG == ingFromNAP);
        System.out.println(ingFromMG.equals(ingFromNAP));
        Ingredient ingFromMG = mg.getIngredient(0);
        Ingredient ingFromNAP = mg.getIngredient(0);
        System.out.println(ingFromMG.equals(ingFromNAP));
        Ingredient ingFromMG = mg.getIngredient(0);
        ingFromMG.setQuantity(ingFromMG.getQuantity()+10);
        System.out.println(mg2.equals(mg));
        Pizza nap = mg.duplicate();
    }
}

// POINT_2 -- draw memory schema at this point

// POINT_3 -- draw memory schema at this point

// POINT_4 -- draw memory schema at this point

// POINT_5 -- draw memory schema at this point

// POINT_6 -- draw memory schema at this point

// POINT_7 -- draw memory schema at this point

// POINT_8 -- draw memory schema at this point

// POINT_9 -- draw memory schema at this point

// POINT_10 -- draw memory schema at this point

Question 9. (6 pt)
Consider the following classes and at each step (indicated by the marker // POINT_? memory schema at this point) draw a schema representing the memory state (stack and heap) during the execution of the method main() of the pizza.Main class.
Please indicate the program output (standard output) at the end of the program execution.

Question 10. (1 pt)
Write the code of the mostUsedIngredient() method from the pizza.Pizza class. This method will return an object reference to the pizza’s ingredient whose quantity is the highest. In case that several Ingredient are used in the same quantity, the last found Ingredient whose quantity is the highest will be returned.