1. **(20 marks)** In Object-Oriented Programming, describe, explain, and give an example to illustrate each of the following keywords:
   a. private (10 marks)
   b. super (10 marks)

2. **(35 marks)** Give the following code

```java
public class Point {
  private int x;
  public static int count1 = 0;
  public int count2 = 0;

  public Point(int x) {
    //TO IMPLEMENT

    System.out.println("Ctor of Point");
    Point.count1++;
   count2++;
  }
}
public class ThreeDPoint extends Point {
  protected int y;
  private int z;
  public ThreeDPoint (int x, int y, int z) {
    // TO IMPLEMENT
    System.out.println("Ctor of ThreeDPoint");
  }
}
```

a. (5 marks) Implement the constructor "`public Point (int x)`"
b. (10 marks) Give examples to show the difference between `count1` and `count2`
c. (10 marks) Implement the constructor "`public ThreeDPoint (int x, int y, int z)`"
d. (10 marks) What is the output after calling
   "`ThreeDPoint b = new ThreeDPoint (1,2,3);`"

Student Name:... ... ...
Student ID:... ... ...

3. (45 marks) Salary Management

As part of the development of HR management software, you have to programmatically calculate the monthly salary of employees in a company. This company has several types of employees:

- Employees are paid a fixed salary (one time).

- Employees are paid according to the number of hours worked in a month. They are paid a certain hourly rate and their overtime (beyond 40 hours) is paid 50% more than regular hours.

- Sales staff are paid a fixed amount plus 2% of the income they have earned for the month.

The necessary operations on all employees are to calculate the salary and display it on the screen as follows:

Employee Mary earns 3600.0$ per month.

Each employee type will have a specific constructor and a method to update the information needed to calculate the salary.

a. [5 marks] Create the Employee class (Employee).

b. [10 marks] Create a fixed-paid employee class (FixedPaidEmployee).

c. [10 marks] Create the hourly employee class (HourlyEmployee).

d. [10 marks] Create class of sales staff (Sales).

e. [10 marks] Creating a Pay class with a main() method allows you to quickly test developed code. Employees are stored there in an array. This array will include one hourly employee, one salesperson, and one fixed-paid employee. Declare, create, and initialize array. Then modify the salesperson's income and the hourly employee's overtime.

-- Good Luck --