



SCHOOL OF COMPUTING AND ENGINEERING SCIENCES  
BACHELOR OF COMPUTER NETWORKING AND SECURITY  
CNS 1207: OBJECT ORIENTED PROGRAMMING  
END OF SEMESTER EXAM

**Date: 7<sup>th</sup> March 2024**

**Time: 08:00-10:00 Hours**

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**Instructions:**

1. This Examination consists of **FIVE** questions.
  2. Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.
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**QUESTION ONE (20 marks)**

- a. Which of the following statements is valid? **(1 mark)**

*myFirstWindow.setVisible("true");*

*myFirstWindow.setVisible(true);*

*myFirstWindow.setVisible();*

- b. Write a java statement to display the text “I love Java” in the console window. **(3 marks)**
- c. Identify and correct all errors in the following program **(6 marks)**

//

*Program Exercise1*

*Attempting to display a frame of size 300 by 200 pixels*

//

*import Javax.Swing.\*;*

*class two{*

```
public static void main method(){  
    myFrame JFrame;  
    myFrame=new JFrame();  
    myFrame.setSize(300,200);  
    myFrame.setVisible();  
}  
}
```

d. Which of the following constructors are invalid?

**(2 marks)**

```
public int ClassA(int one){  
    ...  
}  
public ClassB(int one, int two){  
    ...  
}  
void ClassC(){  
    ...  
}  
  
void ClassC(){  
    ...  
}
```

e. What is the main purpose of a constructor?

**(2 marks)**

- f. If the data member `speed` is private, is the following statement valid in a client program?  
**(2 marks)**

```
Robot aibo;  
  
aibo=new Robot();  
  
double currentSpeed =aibo.speed;
```

- g. Declare two class constants named `MIN_BALANCE` and `MAX_BALANCE` whose data types are double.  
**(2 marks)**
- h. Suppose a class called **Alpha** includes a method called **compute** that accepts no arguments. Define another method of **Alpha** named **myMethod** that calls the **compute** method  
**(2 marks).**
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## QUESTION TWO (20 marks)

Use the below code snippet to answer the questions (a), b) and c) below:

```
import javax.swing.*;  
  
class Sample1 {  
  
    JFrame myWindow;  
  
    myWindow=new JFrame();  
  
    myWindow.setSize(300,200);  
  
    myWindow.setTitle("My First Program");  
  
    myWindow.setVisible(true);  
  
}
```

- a. What is the output of the program?  
**(1 Marks)**
- b. Isolate and indicate the line where object declaration happens.  
**(2 Marks)**
- c. Isolate and indicate the line where object creation happens.  
**(2 Marks)**

- d. Define a Student class. A student has a name. Define two constructors, one with no argument and another with the name as its argument. Initialize the name to a default value “Unknown” for the zero-argument constructor. **(5 marks)**
- e. Explain the FIVE stages of the software life cycle. **(10 Marks)**
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**QUESTION 3 (20 marks)**

- a) What is the output of the below program. **(4 Marks)**

```
class Student{  
    private String studentName;  
    public static void main(String args[]){  
        Student stud = new Student("Zander Yuma");  
        stud.printInfo();  
    }  
    public Student(String name){  
        studentName = name;  
    }  
    public void printInfo(){  
        System.out.println(studentName);  
    }  
}
```

- b) Explain the following: **(6 Marks)**

- i. Overloading
- ii. Encapsulation
- iii. Inheritance

- c) What is the output from the following code? **(6 marks)**

```
class Question{
    private int one;
    public void myMethod(int one){
        this.one=one;
        one = 12;
    }
}
class Test{
    public static void main(String args[]){
        int one=30;

        Question q = new Question();
        q.myMethod(one);

        System.out.println(one);
    }
}
```

d) Consider the following class.

```
class Modifier{
    public static void change(int x, int y){
        x=x-10;
        y=y+10;
    }
}
```

```
}
```

What will be an output from the following code?

(4 marks)

```
int x=40;
```

```
int y=20;
```

```
Modifier.change(x,y);
```

```
System.out.println("x =" + x);
```

```
System.out.println("y =" + y);
```

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#### QUESTION FOUR (20 marks)

- a. Create a class called **invoice** that a hardware store might use to represent an invoice for an item sold at the store. An invoice should include 4 pieces of information as instance variables: a part number (type string), a part description (type string), quantity of the item being purchased (type int) and a price per item (double) **(6marks)**
- b. Provide a **constructor** that initializes the 4 instance variables. Also provide a **set** and **get** method for each of the 4 instance variables. In addition, provide a method named **getInvoiceAmount** that calculates the invoice amount i.e. multiplies the quantity by the price per item, then returns the amount as a double value. If the quantity is not positive, it should be set to 0.0. Write a test application named `invoiceTest` that demonstrates class `invoice`'s capabilities. **(10marks)**
- c. Distinguish between the following:
  - i. Class and Object **(2 Marks)**
  - ii. Object Declaration and Object Creation **(2 Marks)**

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#### QUESTION FIVE (20 marks)

- a) Distinguish between the following: **(6 Marks)**
  - i. Accessor Methods and Mutator Methods

- ii. Programmer-defined classes and standard classes
- iii. Private and public members

b) Design a class that keeps track of a student 's food purchases at the campus cafeteria. A meal card is assigned to an individual student. When a meal card is first issued, the balance is set to the number of points. If the student does not specify the number of points, then the initial balance is set to 100 points. Points assigned to each food item are a whole number.

A student can purchase additional points at any time during a semester. Every time food items are bought; points are deducted from the balance. If the balance becomes negative, the purchase of food items is not allowed. There is obviously more than one way to implement the **MealCard** class. Any design that supports the key functionalities is acceptable. Write a test application named Test that demonstrates the class's capabilities.

**(14 marks)**

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