ACADEMIC YEAR: 2020/2021   **SEMESTER**: MAY-AUG 2021

CODE: BSIT 2232   **UNIT**: Object Oriented Programming with Java

DATE: AUGUST 2021   **TIME**: 2 HOURS

INSTRUCTIONS:
ANSWER YOUR QUESTIONS IN ANSWER BOOKLET PROVIDED
ANSWER QUESTION ONE [COMPULSORY] AND ANY OTHER TWO QUESTIONS

QUESTION ONE   (30 Marks)
a) Define the following terminologies as used in Object Oriented Programming.
  i.   Encapsulation   (1MK)
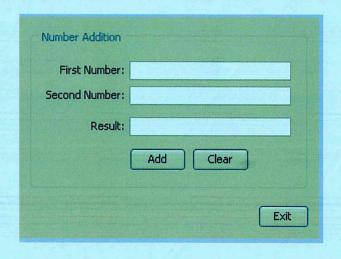 ii. Abstract Class   (1MK)
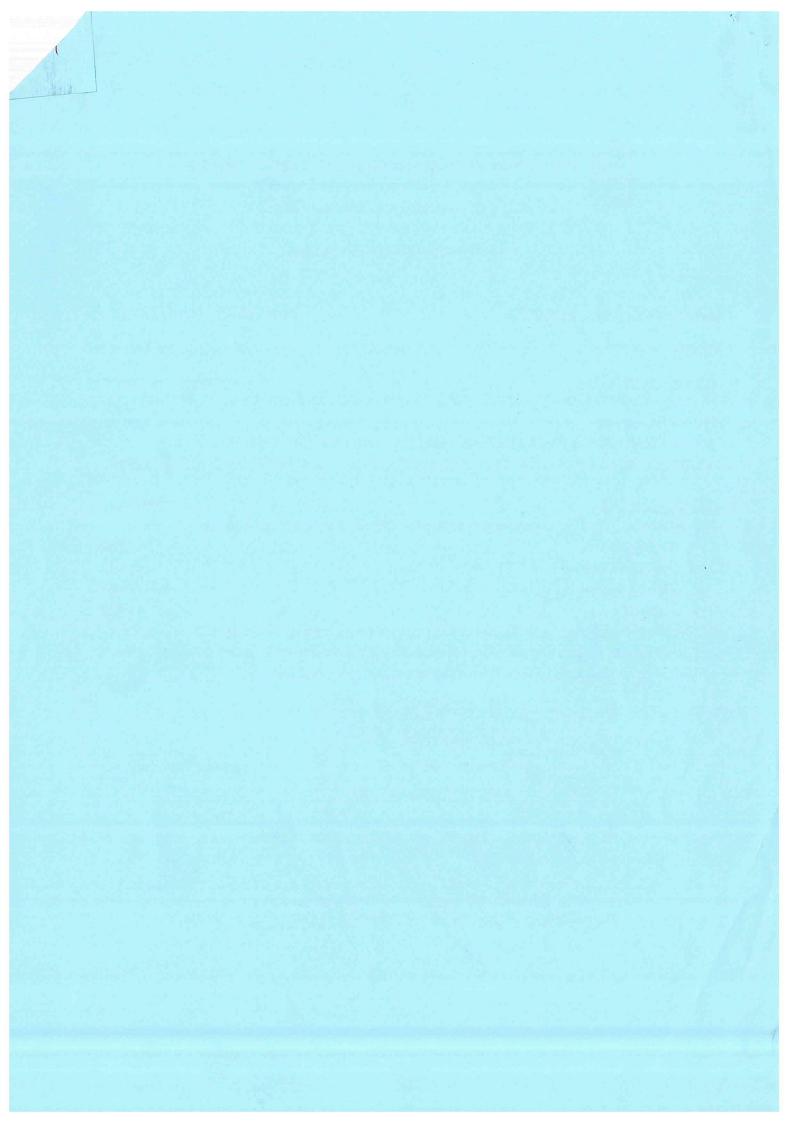 iii. Polymorphism   (1MK)
  v.   Interface   (1MK)
b) A default constructor is a constructor that does not a parameter. Illustrate with an example
   java program to demonstrate your understanding for a default constructor   (4MKS)
c) Study the screen shot give below to answer the questions that follows

Required:

    i.   Write a java program to calculate the "sum" of two numbers entered by the user through the given form and display the answer on the result text field when the button "add" is clicked   **(4MKS)**

    ii. Write the program to clear all the text filed when a user clicks on the button "clear"

                                                            (2MKS)

d) Write a Java program to calculate the area and the perimeter of a rectangle by prompting the user to enter the length and width through the keyboard and display the area on the console screen   **(8MKS)**

e) Draw a labeled UML diagram for a class "product" with three instance variables showing the getter and setter methods clearly.   **(4MKS)**

f) Define two Java access modifiers as used in Java programming visibility   **(4MKS)**

QUESTION TWO   **(20 Marks)**

a) Draw the internal architecture of a JVM   **(5MKS)**

b) Write a java program for a class called Employee with two instance variables "name" and "salary". Create a parameterized constructor with formal parameters having the same name as the instance variables. Write the main method to instantiate an object initialized with values and display the name and the salary on the console screen   **(6MKS)**

c) Distinguish between the following terminologies as used in object oriented programming

    i.   Method overriding and overloading   **(2MKS)**

    ii. "Explicit type casting" and "string concatenation" with an example implementation

                                                            (4MKS)

d) Outline three components of JDBC   **(3MKS)**

QUESTION THREE   **(20 Marks)**

a) State two rules of defining a constructor in a class   **(2MKS)**

b) A company XYZ employs its sales employees with a salary of a 100000 plus a 23000 responsibility allowance if you are a team leader. Write a java program to illustrate the concept of inheritance to display the salary paid to an employee and the responsibility allowance
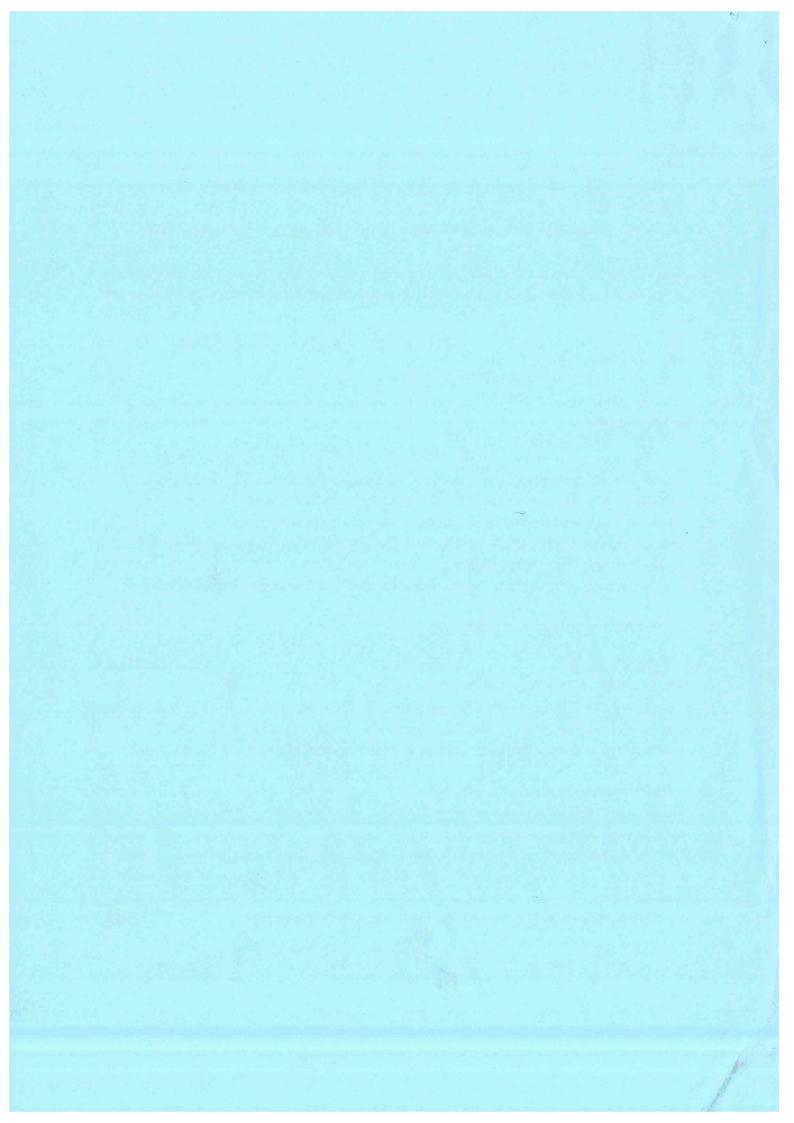
                                                            (4MKS)

c) Outline five features of Java Programming   **(5MKS)**

d) Write a Java application which prompts the user to enter 15 integers, then computes the sum, and then prints the sum to the screen   **(4MKS)**

e) Write a Java program to declare and allocate 4 variables and assign them with some values and calculate the sum of the 1st and the 3rd element of the array. The result is to be displayed on the console screen.   **(4MKS)**

f) Explain multiple inheritance as used in object oriented programming   **(1MK)**

QUESTION FOUR   (20 Marks)

a) The shape cuboid inherits the features of a rectangle. Write a program in java to Calculate the area of rectangle and volume of cuboid using inheritance with methods calculateArea(),calculateVolume() and enterDimensions() . The expected output should be as shown below.   (8MKS)

```
Enter Length 5
Enter Width 7
Enter Height 9
Area of Rectangle 35
Volume of Cuboid 315
```

b) Write a Java program that prompts a user to enter students' marks for five subjects,   calculate the totals, mean and grade of the students. The grading system is as follows as follows:
                                                    (7MKS)

- 70 and above –A
- 60 and 69-B
- 50 to 59 –C
- 40 to 49-D
- 0 to 29-E

examples.

c) Draw a well labelled flowchart to test four Conditions in Java Programming code   (5MKS)