Open University *of* Mauritius

BSc (HONS) COMPUTER SCIENCE [OUbs033]

EXAMINATION FOR: January - February 2022

MODULE : Object Oriented Programming [OUbs033213]

DATE : Saturday 05 February 2022

DURATION : 2 Hours

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of **FOUR (4) QUESTIONS**.

2. Answer **ALL Questions**.

3. Always start a new question on a fresh page.

4. Total marks: **100**

This question paper contains 4 questions and 4 pages.

ANSWER ALL QUESTIONS

QUESTION 1 [25 MARKS]

a) Define Object Oriented Programming.

(5 marks)

b) Name any five primitive data types (apart from char) in Java, and give an appropriate example of an attribute where it may be used, for example, char can be used for gender: M or F.

(5x2 marks)

c) Write a Java method to calculate the VAT amount for a product. A product may be zero-rated or taxable at 15%. A product may also be entitled to a discount percentage. Then, create a main method to test the above method.

(10 marks)

QUESTION 2 [25 MARKS]

a) Write a Java program that creates an array of 2 book objects with the following information:

	Book1	Book2
ISBN	111-222	222-231
Title	Mystery Island	The Crime
Author	John Smith	Louis Paul
Pages	100	125

(10 marks)

b)   Arrays, ArrayList and LinkedList form part of Java Data Structures. For each data structure:

   i.   Mention in which circumstances each is more appropriate to use.

(3 marks)

   ii.   Give the Java code to declare an instance of each.

(3 marks)

   iii.   Compare the features and advantages of each.

(9 marks)

QUESTION 3 [25 MARKS]

a)   Using Java, write down the parent class Total to contain the two data members: quantity and unit_price, constructor, set and get methods.

(7 marks)

b)   Write down the child class Item from the Total class. Add a method Calculate that multiply quantity by unit_price, and display the result.

(7 marks)

c)   Write down a main method that creates an object of type Item, and calls the method Calculate to display the result of the product of quantity and unit_price.

(7 marks)

d)   Mention all the Object Oriented concepts you have used in the program and at which lines.

(4 marks)

QUESTION 4 [25 marks]

a)   Give the **six (6)** steps to create a database connection and to perform a Select SQL statement in Java.

(6 marks)

b)   Explain whether a database connection requires a runtime block and why.

(4 marks)

c) Below is a sample Java program:

```java
1.    private JButton btn = new JButton("Click Me!");
2.    private int num = 0;
3.    public TestInteractiveButton(String s)
4.    {
5.    super(s);
6.    setSize(400, 300);
7.    setLocation(100, 200);
8.    setLayout(new FlowLayout(FlowLayout.CENTER));
9.    btn.addActionListener(this);
10.   add(btn);
11.   setVisible(true);
12.   }
13.   public void actionPerformed(ActionEvent e)
14.   {
15.   if(e.getSource().equals(btn))
16.   {
17.   num++;
18.   System.out.println("You clicked me " + num + " times.");
19.   }
20.   }
```

i.   Explain the lines 1, 3, 5, 6, 7, 8, 9, 10, 11, 13 and 15.

(11 marks)

ii.   Give the missing lines or libraries required at the top of the program and explain their purpose.

(4 marks)