Open University *of* Mauritius

BSc (HONS) APPLIED ICT [OUbs017]

EXAMINATION FOR: July / August 2021

MODULE : Object Oriented Programming [OUba017214]

DATE : Wednesday 18 August 2021

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 6 pages

ANSWER ALL QUESTIONS

QUESTION 1 [25 MARKS]

a) How is Object Oriented Programming different from Structured Programming?

(5 marks)

b) Name any **five (5)** primitive data types in Java, and give an example of an attribute where it is used.

(5x2 marks)

c) Draw a Use Case Diagram for a Credit Approval Agency involving an applicant, an operator, and an approval supervisor.

(10 marks)

QUESTION 2 [25 MARKS]

a) Write a Java program that creates an array of **two (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) Using a LinkedList collection, give the Java codes to:

i. Create a LinkedList called Name
ii. Add **three (3)** names
iii. Remove the first and the last names
iv. Check whether the LinkedList has elements
v. Display all the elements of the LinkedList

(5x3 marks)

QUESTION 3 [25 MARKS]

The following codes demonstrates an OO concept.

```
public class Ooconcept
{
    private String geekName;
    private int geekRoll;
    private int geekAge;

    public int getAge()
    {
      return geekAge;
    }

    public String getName()
    {
      return geekName;
    }

    public int getRoll()
    {
       return geekRoll;
    }
    public void setAge( int newAge)
    {
      geekAge = newAge;
    }

    public void setName(String newName)
    {
      geekName = newName;
    }

    public void setRoll( int newRoll)
    {
      geekRoll = newRoll;
    }
}


public class TestOoconcept
{
    public static void main (String[] args)
    {
        Ooconcept obj = new Ooconcept();

        obj.setName("Harsh");
        obj.setAge(19);
        obj.setRoll(51);

        System.out.println("Geek's name: " + obj.getName());
        System.out.println("Geek's age: " + obj.getAge());
        System.out.println("Geek's roll: " + obj.getRoll());
    }
}
```

a) Name the OO concept demonstrated.

(1 mark)

b) Give the features of this OO concept.

(5 marks)

c) List the advantages of this OO concept.

(8 marks)

Study the following codes, then answer the following questions:

```
class Main {
    public static void main(String[] args)
    {

        System.out.println(MultiplyFun.Multiply(2, 4));

        System.out.println(MultiplyFun.Multiply(5.5, 6.3));
    }
}
```

d) Write the class “MultiplyFun”.

(8 marks)

e) Give the output when the program is run.

(2 marks)

f) Give a name for this OO concept.

(1 mark)

QUESTION 4 [25 MARKS]

a) Below is a sample Java program.

```
import java.io.*;

public class SerializeDemo
{
public static void main(String[] args)
{
Employee e =new Employee();
  e.name ="Reyan Ali";
  e.address ="Phokka Kuan, Ambehta Peer";
  e.SSN =11122333;
  e.number =101;
try
{
FileOutputStream fileOut =new FileOutputStream("employee.ser");
ObjectOutputStream out=new ObjectOutputStream(fileOut);
out.writeObject(e);
out.close();
fileOut.close();
}catch(IOException i)
{
  i.printStackTrace();
}
}
}
```

i) What is the purpose of the program?

(4 marks)

ii) Why is the presence of the Try-Catch block necessary?

(4 marks)

b) A thread is a lightweight unit parcel of a process. In other words, a process can be broken into a number of threads. The concept of multithreading in a programming language is referred to as thread-based multitasking. Explain the purpose behind multithreading.

(2 marks)

c) Give the **two (2)** mechanisms by which we can create Threads in Java.

(2 marks)

d) List the **five (5)** states of a thread.

(5 marks)

e) Every Java thread has a priority that helps the operating system determine the order in which threads are scheduled. Explain how you can change this scheduling order.

(4 marks)

f) Multi-threaded programs may often come to a situation where multiple threads try to access the same resources and finally produce erroneous and unforeseen results. Explain how this can be avoided in Java.

(4 marks)