Open University of Mauritius

BSc (HONS) APPLIED ICT [OUbs017]

EXAMINATION FOR:		November/December 2020
MODULE	:	Object Oriented Programming [OUbs017214]
DATE	:	Wednesday 16 December 2020
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) Some key features of Object Oriented Programming are listed below.

i. Class
ii. Object
iii. Encapsulation
iv. Abstraction
v. Polymorphism
vi. Inheritance
vii. Dynamic binding
viii. Instantiation and constructors
ix. Overriding
x. Overloading

Explain briefly each **one (1)** of these terms.

(10x2 marks)

QUESTION 2 [25 MARKS]

a) Show the output when the following program is run, providing explanations.

```
public class test {
        public static int average(int n1, int n2) {
            System.out.println("Run version A");
            return (n1+n2)/2;
          }

          public static double average(double n1, double n2) {
            System.out.println("Run version B");
            return (n1+n2)/2;
          }

          public static int average(int n1, int n2, int n3) {
            System.out.println("Run version C");
            return (n1+n2+n3)/3;
          }

          public static void main(String[] args) {
            System.out.println(average(1, 2, 3));
            System.out.println(average(1, 2));
            System.out.println(average(1.0, 2.0));
            System.out.println(average(1.0, 2));
            System.out.println(average(1,2,3,4));
        }

}
```

(5x3 marks)

b) Name any **four (4)** primitive data types in Java, and state their range of values.

(4 marks)

c) Draw a Use Case Diagram for an Online Shopping scenario involving a customer, a seller and a payment agent.

(6 marks)

QUESTION 3 [25 MARKS]

a) Identify **four (4)** errors in the following program, and give the corresponding correction.

```
public static void main(String[] args) {
        File f1 = File("c:/test/");
        f1.mkdir();

        File f2 = File("c:/test/test.txt");
        PrintWriter pw1 = null;
        try
        {
                pw1 = new PrintWriter(F2);
                pw2.println("hello world");
        }
        catch (FileFoundException e)
        {
                System.out.println(e);
        }
        finally
        {
           pw1.close();
        }
}
```

(4x3 marks)

b) Write Java codes to perform the following:

i. Create a LinkedList of String values.
ii. Add four String values.
iii. Display the four values using a For loop.
iv. Remove the last String value.
v. Add a new String value at the beginning of the list.

(5x2 marks)

c) List the differences between an Array and a LinkedList.

(3 marks)

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?

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

(4+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 as thread-based multitasking. Explain the purpose behind multithreading.

(3 marks)

c) Write a simple Java program to demonstrate the use of multithreading.

(10 marks)

d) 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)