Open University *of* Mauritius

BSc (HONS) APPLIED ICT [OUbs017]

EXAMINATION FOR: January - February 2022

MODULE : Object Oriented Programming [OUbs017214]

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 5 pages.

ANSWER ALL QUESTIONS

QUESTION 1 [25 MARKS]

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

(5 marks)

b) Differentiate between the following Object-Oriented concepts:

i. no-argument constructor v/s overloaded constructor
ii. public v/s private variables
iii. concrete class v/s abstract class
iv. getters v/s setters
v. method overloading v/s method overriding

(5x2 marks)

c) Write a Java program that performs a Linear Search in an Array to find a user-inputted integer.

(10 marks)

QUESTION 2 [25 MARKS]

a) Write down the parent class *Calculate* to contain the two data members: value1 and value2, constructor, set methods and get methods.

(7 marks)

b) Write down the child class *Sum* from the *Calculate* class. Add a method *Show* that sum two values, and display the result.

(7 marks)

c) Write down a main method that creates an object of type *Sum,* and calls the method *Show* to display the result of the addition of two values.

(7 marks)

d) Mention the OO concepts used inside the program.

(4 marks)

QUESTION 3 [25 MARKS]

The following shows a Java program that works with Files.

```
1.  package hw2;
2.
3.  import java.io.File;
4.  import java.io.FileNotFoundException;
5.  import java.util.InputMismatchException;
6.  import java.io.PrintWriter;
7.  import java.util.Scanner;
8.
9.  public class hw2 {
10.         public static void main(String args[]){
11.
12.                 Scanner input = new Scanner(System.in);
13.
14.                 int age = 0;
15.                 String name;
16.
17.                 File folder = new File("C:/Staff");
18.                 folder.mkdir();
19.
20.                 File text = new File("/C:/Staff/Names.txt");
21.                 PrintWriter pw1 = null;
22.
23.
24.                 do{
25.                         System.out.print("Enter name: ");
26.                         name = input.nextLine();
27.                 }while(name.length() == 0);
28.
29.
30.                 try{
31.
32.                         do{
33.                                 System.out.print("Enter age: ");
34.                                 age = input.nextInt();
35.                         }while(age < 18 || age > 100);
36.
37.                 }
38.
39.                 catch(InputMismatchException e){
```

```
40.                         System.out.println("InputMismatchExeption : Enter numbers
    only.");
41.
42.                 }
43.
44.                 try{
45.                         pw1 = new PrintWriter(text);
46.                         pw1.println("Name = " + name);
47.             pw1.println("Age = " + age);
48.                 }
49.
50.                 catch(FileNotFoundException e){
51.                         System.out.println(e);
52.                 }
53.
54.
55.                 finally
56.                 {
57.
58.                         pw1.close();
59.                         input.close();
60.                 }
61.
62.
63.         }
64. }
```

a) Explain the lines 1, 3, 12, 14, 20, 26, 27, 35, 58 and 59.

(10x2 marks)

b) What is the purpose of the Try – Catch – Finally block? Name two other situations where it can be used.

(3 marks)

c) What happens if several Catch blocks match the type of the thrown object?

(2 marks)

QUESTION 4 [25 MARKS]

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

	Book1	Book2
ISBN	111-222-333	222-333-444
BookTitle	Mystery Island	The Crime
Author	John Smith	Louis Paul
Pages	100	250

(10 marks)

b) Arrays and ArrayList are Data Structures used in Java. List their features.

(6 marks)

c) Explain why multithreading is preferred to single thread in a client-server application?

(2 marks)

d) Name the **two (2)** classes that allow multithreading programming in Java.

(2 marks)

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

(5 marks)