UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
(ONLINE)
SEMESTER II
SESSION 2019/2020

COURSE NAME	:	VISUAL PROGRAMMING
COURSE CODE	:	BIE 20404
PROGRAMME CODE	:	BIP
EXAMINATION DATE	:	JULY 2020
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTIONS	:	1. ANSWER **ALL** QUESTIONS 2. STUDENTS SHOULD UPLOAD THE ANSWER BOOKLET (PDF/ WORD FORMAT) WITHIN 30 MINUTES AFTER EXAMINATION PERIOD

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAPER

Q1 (a) Write a Java program to define a class named `Cone` based on the description in **Figure Q1(a)**.

A class named `Cone` contains private attributes `radius`, `height` and `pi`. The default constructor with public visibility of this class will initilize `pi` with value `3.142`. A public method named `getVolume` will received two parameters and assign to `radius` and `height`. Method `getVolume` also will calculate the volume of cone and return the value to the method caller. The formula to calculate the volume of cone is given as the following:

$$V = \pi r^2 \frac{h}{3}$$

FIGURE Q1(a)

(10 marks)

(b) Draw a complete UML class diagram with their correct relationships based on Java segment codes in **Figure Q1(b)**.

(14 marks)

```
class Fish implements Animal{
  public void leg() {
  System.out.println("I don't have legs");}

  public void body() {
  System.out.println("I have scales");}
}

class Cat implements Animal, Behavior{

  public void leg() {
  System.out.println("I have 4 legs");}

  public void body() {
  System.out.println("I have have fur");}

  public void eat() {
  System.out.println("I eat fish"); }

  public void move() {
  System.out.println("I catwalk");}

  public void sound() {
  System.out.println("meow...meow..");}
}
```


FIGURE Q1(b)

Q2 Apply exception handling for the Java segment code in **Figure Q2** using `try...catch` block.

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

int num1 = 5;
int num2 = 0;

int result= num1/num2;
System.out.println("Result:" + result);
System.out.println("If exception handling is working");
System.out.println("This line must be appeared");
}
```

FIGURE Q2

(10 marks)

Q3 (a) Write a segment code in Java to create the user interface component as shown in **Figure Q3(a)**.

(12 marks)

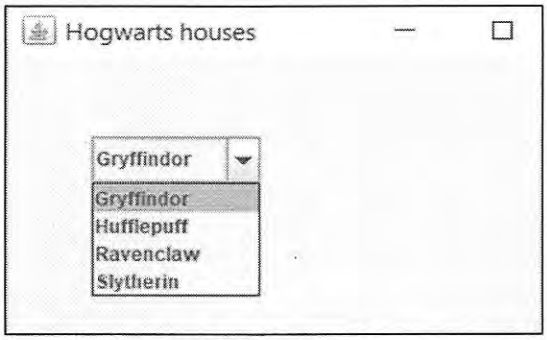

FIGURE Q3(a)

(b) Write a segment code in Java to create a group of radio buttons with the labels "Beginner" and "Intermediate" as shown in **Figure Q3(b)**.

(8 marks)

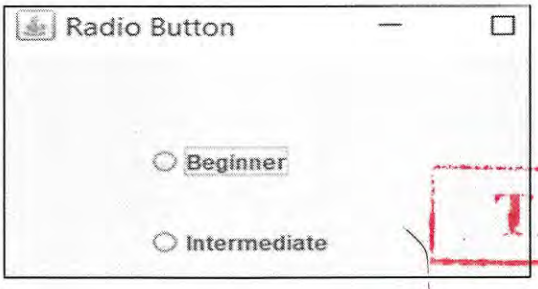

FIGURE Q3(b)

Q4 Answer **Q4(a) – Q4(d)** based on Java program code in **Figure Q4(a)** and its Graphical User Interface (GUI) in **Figure Q4(b)**.

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;

public class BMI implements ActionListener{
//Swing GUI component declaration

private final JFrame frame;

      public BMI() {

         //Set up GUI components

         computeButton.addActionListener(this);
         frame = new JFrame("BMI");
         frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
         frame.setLayout(new BorderLayout());
         frame.add(bmiLabel, BorderLayout.NORTH);
         frame.add(center, BorderLayout.CENTER);
         frame.add(computeButton, BorderLayout.SOUTH);
         frame.pack();
         frame.setVisible(true);
      }

      public void actionPerformed(ActionEvent event) {

      //Handle clicks on compute button to calculate the BMI
      //Read height and weight data from text fields

      }

      public static void main (String args[]) {
         BMI gui = new BMI();
      }

}
```

FIGURE Q4(a)

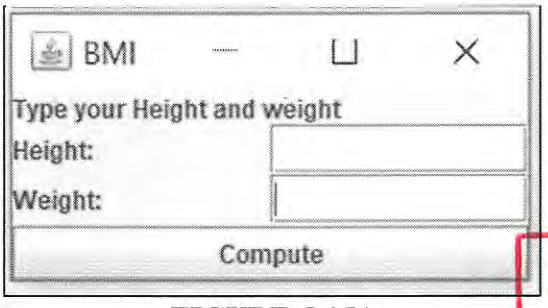

FIGURE Q4(b)

(a) Analyze the requirements (input, output and GUI elements) required to develop a Java application as illustrated in **Figure Q4(b)**.

(6 marks)

(b) Write the swing GUI components declaration statements for the program.

(4 marks)

(c) Write the method implementation for `actionPerformed()`. The formula to calculate Body Mass Index (BMI) is given as follows:

$$BMI = \frac{weight}{height^2} \times 703$$

(6 marks)

(d) Write Java codes to declare the GUI components for the program.

(10 marks)

- END OF QUESTIONS -