UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2015/2016

COURSE NAME	:	VISUAL PROGRAMMING
COURSE CODE	:	BIE 20404
PROGRAMME CODE	:	BIP
EXAMINATION DATE	:	JUNE / JULY 2016
DURATION	:	2 HOURS AND 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **SEVEN (7)** PAGES

Q1 (a)   Give **THREE (3)** important parts of a GUI application.

(3 marks)

      (b)   Describe the following Swing GUI components:

          (i)   JTextField

          (ii)   JComboBox

          (iii)   JPanel

(6 marks)

      (c)   List **FOUR (4)** types of button.

(4 marks)

Q2 (a)   Compare **TWO (2)** differences between BorderLayout and GridLayout.

(8 marks)

      (b)   State **THREE (3)** Swing GUI classes for handling text.

(3 marks)

      (c)   Define about event handling.

(4 marks)

      (d)   Distinguish **TWO (2)** categories of exception.

(4 marks)

      (e)   Give **TWO (2)** examples for each exception categories answered in **Q2 (d)**.

(4 marks)

      (f)   State the appropriate unchecked exception for the following programming logic errors:

          i.   Access an object through a reference variable before an object is assigned to it.

(2 marks)

          ii.   Access an element in an array outside the bounds of the array.

(2 marks)

Q3   Consider the following Java code:

```
int lowerLimit;
...
try
{
System.out.println("Entering the try block.");
if (lowerLimit < 100)
throw new Exception("Lower limit violation.");
System.out.println("Exiting the try block.");
}
catch (Exception e)
{
System.out.println("Exception: " + e.getMessage());
}
System.out.println("After the catch block");
```

(a)   Identify the output if the value of `lowerLimit` is 50.

(4 marks)

(b)   Identify the output if the value of `lowerLimit` is 150.

(3 marks)

Q4   Given the following Java program:

```
import java.awt.*;
import javax.swing.JApplet;
public class GrandWelcome extends JApplet
{
public void paint(Graphics g)
{
super.paint(g);
g.setColor(Color.red);
g.setFont(new Font("Courier", Font.BOLD, 24));
g.drawString("Welcome to Java Programming", 30, 30);
}
}
```

(a)   Illustrate the output in an applet based on the above Java program.

(5 marks)

(b)   Write the HTML tags for the applet answered in **Q4(a)**.

(5 marks)

Q5   Question **Q5(a)-Q5(b)** are based on **Figure Q5**.
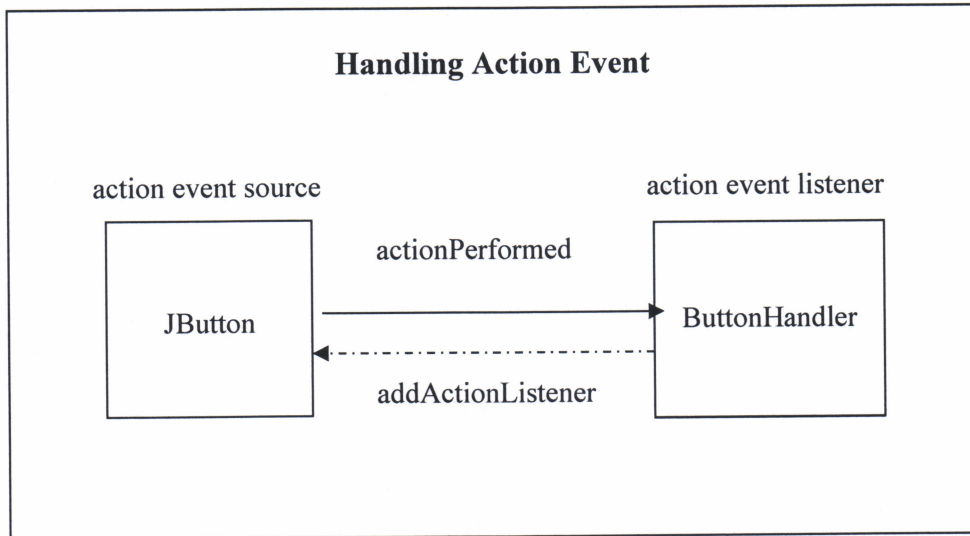

Figure Q5

(a)   Construct Java codes that declare action event source (`JButton`), action event listener (`ButtonHandler`) and their relation using `addActionListener` method.

(6 marks)

(b)   Write the appropriate implementation of the `actionPerformed()` method that will set the `JFrame` title according to the clicked button constructed in **Q5(a)**.

(8 marks)

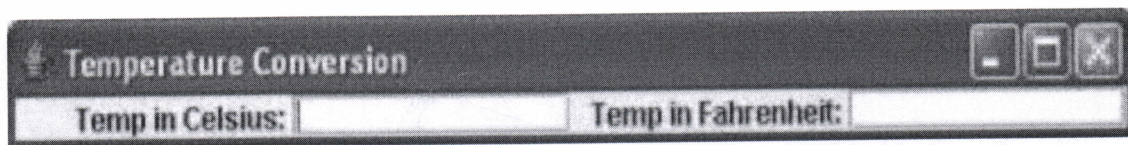**Q6**   Question **Q6 (a)-Q6 (c)** are based on **Figure Q6**.

Figure Q6

(a)   Analyze the requirements including the input and output process involved if a Java program is about to be developed according to **Figure Q6**.

(6 marks)

(b)   Given that the calculation to convert temperature from Fahrenheit to Celcius is as the following:

°F to °C Deduct 32, then multiply by 5, then divide by 9

Produce the formula to calculate the equivalent temperature in Celsius and Fahrenheit.

(4 marks)

(c)   Given the following Java program structure for **Figure Q6**:

```java
import java.awt.*; //for the class Container
import java.awt.event.*; //for events
import javax.swing.*; //for JLabel and JTextFieldpublic

class TempConversion extends JFrame
{
        // Swing GUI components declaration
        // Handlers declaration

        //Named constants declaration for calculation formula
        private static final int WIDTH = 500;
        private static final int HEIGHT = 50;
        private static final double FTOC = 5.0 / 9.0;
        private static final double CTOF = 9.0 / 5.0;
        private static final int OFFSET = 32;


        public TempConversion()
        {


        Container c = getContentPane();
        c.setLayout(new GridLayout(1, 4));
        celsiusLabel = new JLabel("Temp in Celsius: ",
        SwingConstants.RIGHT);
        fahrenheitLabel = new JLabel("Temp in Fahrenheit: ",
        SwingConstants.RIGHT);
        celsiusTF = new JTextField(7);
        fahrenheitTF = new JTextField(7);


        //add the label celsiusLabel  to the container
        //add the text field celsiusTF to the container
        //add the label fahrenheitLabel to the container
        //add the text field fahrenheitTF to the container

        celsiusHandler = new CelsHandler();
        fahrenheitHandler = new FahrHandler();

        celsiusTF.addActionListener(celsiusHandler);
        fahrenheitTF.addActionListener(fahrenheitHandler);
```

```
        setSize(WIDTH, HEIGHT);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setVisible(true);

        }

        private class CelsHandler implements ActionListener
        {
                public void actionPerformed(ActionEvent e)
                {

                /*The temperature in Celsius is contained in the
                JTextField celsiusTF. The method getText of the class
                JTextField is used to retrieve the temperature in
                celsiusTF. However, the value returned by the method
                getText is in string form, therefore the method
                parseDouble of the class Double is used to convert the
                numeric string into a decimal value. It follows that a
                variable of type double, Celsius, is needed to store the
                temperature in Celsius. A variable of type double,
                fahrenheit, is also needed to store the equivalent
                temperature in Fahrenheit. Use the method format of the
                class String, to display the temperature to two decimal
                places.*/

                }
        }


        private class FahrHandler implements ActionListener
        {
                public void actionPerformed(ActionEvent e)
                {}
        }


        public static void main(String[] args)
        {
        TempConversion tempConv = new TempConversion();
        }

}
```

i. Write a complete Swing GUI components and handlers declaration statements for the Java program.

(6 marks)

ii. Write the Java codes that set the title of the JFrame window according to **Figure Q6.**

(2 marks)

iii. Write the Java codes that adds the GUI components answered in **Q6(c)(i)** to the container of the Java program.

(4 marks)

iv. Interpret the statements stated within the comments belongs to method `actionPerformed()` for class `CelsHandler` by writing the definition of the method in Java codes.

(10 marks)

-END OF QUESTION -