Institute of Technology
Blanchardstown
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INSTITUTE OF TECHNOLOGY
BLANCHARDSTOWN

HIGHER CERTIFICATE IN COMPUTING IN INFORMATION TECHNOLOGY
BN002

Advanced Programming
COMP H2030

Year 2
REPEAT PAPER

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External Examiner(s): Mr. John Dunnion
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Tuesday 28th August 2007

1.00pm – 3.00pm

Instructions to candidates:

1. This paper consists of 5 questions.
2. Candidates should attempt any 4 questions.
3. All questions carry equal marks.

DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD TO DO SO

Question 1

a) Describe the function of an **executable JAR** file in Java.

[4 marks]

b) Describe clearly the effects of declaring a Java class feature as **static**.

[5 marks]

c) Add appropriate **Javadoc** comments to the following method:

```
public double cube(double x) {
        return x * x * x;
}
```

[4 marks]

d) Describe, in brief, TWO advantages of using **packages** in advanced Java projects.

[6 marks]

e) Outline the effect of applying EACH of the following **access modifiers** to a class feature in Java:

i private
ii protected
iii package

[6 Marks]

[Total 25 marks]

Question 2

a) Describe briefly the function of any THREE media control methods found in the **java.applet.AudioClip** interface.

[6 Marks]

b) Write Java code statements to demonstrate the use of the **instanceof** comparator in Java.

[4 Marks]

c) Write Java code to demonstrate the use of an **inner class** in Java.

[6 Marks]

d) Write TWO Java classes that illustrate the **interface** AND **class inheritance** approaches to implementing threads in Java.

[9 Marks]

[Total 25 marks]

Question 3

a) Describe briefly how to create a **custom exception class** in Java.

[6 Marks]

b) Describe with the aid of Java code statements EACH of the following exception handling concepts:

i **Handle** an exception
ii **Declare** an exception

[10 Marks]

c) Briefly explain ANY TWO the following strategies for handling exceptions in Java:

i **Log** exceptions using a log file
ii **Retry** failed action in a catch block
iii **Request the user** to respond to an exception
iv Provide **default or alternative values** in a catch block

[6 Marks]

d) Write a Java **interface** structure that defines the TWO operations of a DVD player.

[3 Marks]

[Total 25 marks]

Question 4

a) List TWO commonly used **interfaces** available in Java. Explain the function of EACH of the interfaces listed.

[8 Marks]

b) Outline TWO differences between an **abstract class** and an **interface** structure in Java.

[4 Marks]

c) Write a Java class definition called **Employee** that models a company employee with attributes employee name, employee number and job description. Provide an appropriate non-blank **constructor** for **Employee** objects. Provide appropriate **accessor** and **mutator** methods for the employee attributes.

[10 Marks]

d) Demonstrate using a Java code statement how to create an object of type **Employee** as defined in part (c) above.

[3 Marks]

[Total 25 marks]

Question 5

a) Describe the function of the **Locale** class in Java.

[4 Marks]

b) Describe the role played by **Unicode** in Java internationalization.

[4 Marks]

c) Examine the **ProgramResource_fr** and **SimpleGUI** classes below, then answer the ALL of the questions that follow:

```
//Program Resources class for French
public class ProgramResource_fr extends ListResourceBundle {

 private static final Object[][] contents = { {"stopButton","Arretez"}};

 public Object[][] getContents() {
    return contents;
 }
}

//SimpleGUI Class
import javax.swing.*;
import java.util.*;
import java.awt.*;

public class SimpleGUI extends JFrame {

 ResourceBundle res;

 public SimpleGUI() {
  Locale loc = new Locale("fr","FR");
  res = res.getBundle("ProgramResource",loc);
  JButton stopButton = new JButton(res.getString("stopButton"));
  getContentPane().add(stopButton,BorderLayout.SOUTH);
  setSize(200,200);
  setVisible(true);
 }

 public static void main(String[] args) {
  SimpleGUI myGui = new SimpleGUI();
 }
}
```

i Describe briefly the relationship between the **ProgramResource_fr** class and the **SimpleGUI** classes above.

[4 Marks]

ii Describe clearly the function of the variable **res** in the **SimpleGUI** class above. Address EACH occurrence of the **res** variable.

[9 Marks]

d) Explain the function of the **PropertyResourceBundle** class in Java.

[4 Marks]

[Total 25 marks]