INSTITUTE OF TECHNOLOGY BLANCHARDSTOWN

Year	Year 2
Semester	Spring
Date of Examination	Wednesday 21st May 2008
Time of Examination	9.30am - 11.30am

Programme Title	HIGHER CERTIFICATE IN SCIENCE IN COMPUTING IN INFORMATION TECHNOLOGY
Programme Code	BN002
Programme Title	BACHELOR OF SCIENCE IN COMPUTING IN INFORMATION TECHNOLOGY
Programme Code	BN013
Programme Title	BACHELOR OF SCIENCE (HONOURS) IN COMPUTING
Programme Code	BN104
Module Title	Advanced Programming
Banner Module Code	COMP H2030

Internal Examiner(s): *Mr. Luke Raeside*

External Examiner(s): *Mr. John Dunnion*
Dr. Richard Studdert

Instructions to candidates:

1) **To ensure that you take the correct examination, please check that the module and programme which you are following is listed in the tables above.**
2) **Answer any FOUR questions.**
3) **All questions carry equal marks (25 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 EACH of the following keywords in Java.

i extends
ii implements

[6 Marks]

b) Using Java code create an **abstract base class** called Animal that contains ONE **abstract method** called feed() which returns a **String**.

[6 Marks]

c) Write a Java class definition called **Circle** that models a circle with x and y co-ordinates at its centre and a radius. Provide an appropriate non-blank **constructor** for circle objects. Provide appropriate **accessor** and **mutator** methods for the circle attributes.

[10 Marks]

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

[3 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 any TWO operations of a DVD player.

[3 Marks]

[Total 25 marks]

Question 4

a) Outline TWO advantages of using an **IDE** (Integrated Development Environment) in large-scale software development. Name ONE IDE used in industry.

[5 marks]

b) Define **class reflection**. Outline the function of TWO reflective methods available in the class **Class**.

[6 Marks]

c) Briefly describe THREE advantages of using **threads** in programming.

[6 Marks]

d) Demonstrate how to apply **threads** to a Java class using an intuitive example.

[8 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 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]