INSTITUTE OF TECHNOLOGY BLANCHARDSTOWN

Year	Year 2
Semester	Summer Paper
Date of Examination	**Wednesday 18th May 2011**
Time of Examination	**3.30pm – 5.30pm**

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): *Dr. 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) 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 the function of the keyword **static** in Java.

[3 marks]

c) Describe briefly how to add **Javadoc** comments to a method (provide a sample method with your answer).

[5 marks]

d) Define the term **modularization** in the context of software development. Briefly outline the role that the **package** keyword can play in the **modularization** of code in Java.

[6 marks]

e) Explain the effect of applying the following access modifiers to a class feature:

i. **protected**
ii. **default** (also known as **package** access)

[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) Briefly outline the function of the **instanceof** comparator in Java. Write a sample Java **if** statement to demonstrate how the **instanceof** comparator is used.

[6 marks]

c) Write Java code to demonstrate the use of an **inner class** (include the outer and inner class definitions). Describe how an **anonymous inner class** differs from an **inner class**.

[9 marks]

d) Write a Java class definition to illustrate the **interface** approach to implementing threads in Java.

[4 marks]

[Total 25 marks]

Question 3

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

[6 marks]

b) Write a Java class definition called **Computer** that models a computer with attributes colour, processor speed and make. Provide an appropriate non-blank **constructor** for **Computer** objects. Write a second class which inherits from the **Computer** class above called **Laptop** which has a specialized attribute to represent the battery life of the a laptop.

[10 marks]

c) Explain clearly the effects of declaring a variable as **final static** in Java.

[4 marks]

d) Describe briefly the following programming terms:

i. **Method signature**
ii. **Method overloading**

[5 marks]

[Total 25 marks]

Question 4

a) Write a sample **try – catch – finally** block using Java code. Describe briefly the function of the **finally** block in Java.

[6 marks]

b) Explain the difference between **handling** and **declaring** an exception in Java. Use Java code examples to aid your explanation.

[8 marks]

c) Describe briefly what is meant by an **unchecked** exception and a **checked** exception in Java. List ONE commonly encountered **unchecked** exception in Java.

[6 marks]

d) Using an intuitive example explain briefly the concept of **polymorphism** in object oriented programming.

[5 marks]

[Total 25 marks]

Question 5

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

[2 marks]

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

```
public class ProgramResource_ga extends ListResourceBundle {

 private static final Object[][] contents = { {"home_button_message","Baile"}};

 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("ga");
  res = res.getBundle("ProgramResource",loc);
  JButton homeButton = new JButton(res.getString("home_button_message"));
  getContentPane().add(homeButton,BorderLayout.SOUTH);
  setSize(200,200);
  setVisible(true);
 }

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

i Describe briefly the function of the **ProgramResource_ga** class above.

[4 marks]

ii Explain in detail each line of code contained with the constructor of the **SimpleGUI** class above. Ensure that you clearly explain the use of the **res** variable in your answer.

[11 marks]

c) List TWO **locale sensitive** classes in Java. Describe the function and usage of EACH of the locale sensitive classes listed.

[8 marks]

[Total 25 marks]