CORK INSTITUTE OF TECHNOLOGY

INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Semester 1 Examinations 2012/13

Module Title: Object-Oriented Programming 1

Module Code: SOFT7004

School: Science & Informatics

Programme Title: BSc in Computing – Year 3 / BSc in Computing (ACCS) – Year 3
BSc (Hons) in Software Development & Computer Networking – Year 2
BSc (Hons) in Software Development – Year 2
BSc (Hons) in Web Development – Year 2

Programme Code: KCOMP_7_Y3
KCOME_7_Y3
KDNET_8_Y2
KSDEV_8_Y2
KWEBD_8_Y2

External Examiner(s): Mr Joseph Lynam
Internal Examiner(s): Ms Deirdre M. Dunlea, Mr Denis Long, Ms Oonagh O'Brien

Instructions: **Answer three Questions.**
Question 1 is mandatory.

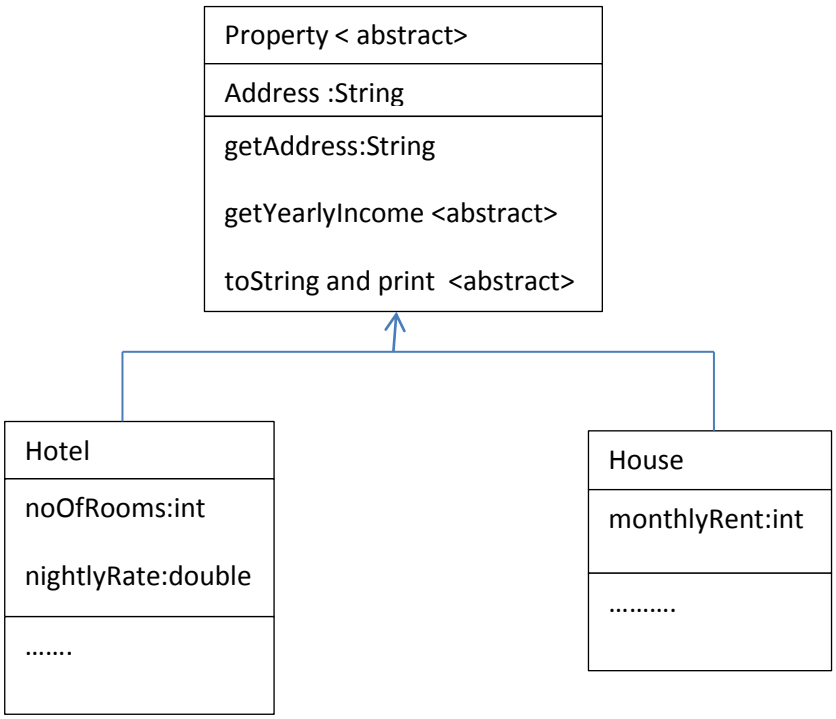
Duration: 2 Hours

Sitting: Semester 1 2012/13

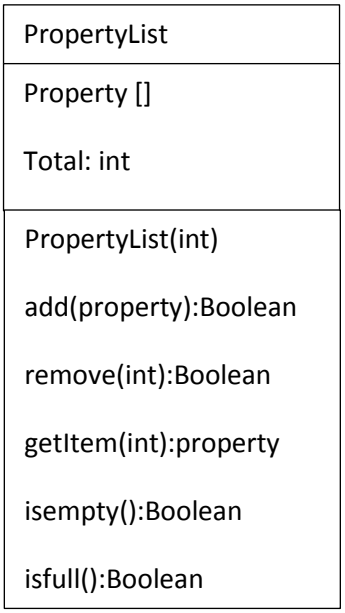
Requirements for this examination:

Note to Candidates: Please check the Programme Title and the Module Title to ensure that you have received the correct examination paper.
If in doubt please contact an Invigilator.

Q1. The following describes a class hierarchy involved in a computer application.



A class Propertylist described below stores property objects.



a) Write the code for the above classes. **(20 Marks)**

b) Write a menu driven program to allow a user to

add a property

getAllHouseIncomePerYear

displayAllProperties **(20 marks)**

Q2

a) What is an exception? **(2 marks)**

b) Give an example of three different Exceptions and when they might occur? **(6 marks)**

c) Describe in detail the three ways that a program can deal with an exception. **(6 marks)**

d) Exceptions can be Checked or unchecked distinguish between the two. **(4 marks)**

e) A class accepts phone numbers from the user (keyboard) an exception is to be thrown when a phone number outside the range of 4300000 to 4399999 is entered (only internal calls are allowed in the college), or when a number of inappropriate length is used, or nonnumeric phone number is entered. Write code to implement this. **(12 marks)**

Q3 a) In terms of object oriented programming what is meant by the following:

A one-way relationship between objects

A one to many relationship between objects

A bi-directional relationship between objects

Give an outline java code example of how you might achieve the implementation of each type of relationship. **(9 marks)**

b) What is a subclasss? **(1 marks)**

Why would we want to create a subclass? **(2 marks)**

How are subclasses created? Give an example. **(3 marks)**

Give two ways that the variables of a superclass can be accessed from a subclass. Which is the more correct way to access these variable and why ? **(3 marks)**

When and why might we use the word “this” in a java program? **(1 marks)**

c) What is an ArrayList? **(1 marks)**

Show how to declare an ArrayList in java. **(2 marks)**

Describe any 4 methods of the ArrayList class and give an example of each. **(4 marks)**

Compare standard arrays with Arraylists. **(4 marks)**

Q.4 a) What are the four main desirable features of a piece of software? **(4 marks)**

b) What is meant by white box and black box testing distinguish between the two and give an example of each? **(6 marks)**

c) What is meant by unit testing and integration testing? **(4 marks)**

d) What is a robust program and how generally could it be achieved? **(5 marks)**

e) In a class called **PushToLimitSalesStaff** we create an object called cars4U this object has a method SetFigure, why is this code considered not robust suggest alterations to make it more robust.

```
for (int i = 1; i<=3; i++)
        {
        System.out.println ("enter sales for employee "+ i);
        value = EasyIn.getInt();
        cars4U.setFigure(i, value);
        }
public void setFigure(int numberIn, int valueIn)
{
    staff[numberIn-1] = valueIn;
}
```

(3 marks)

f) A file called text.dat contains simple text (words only no punctuation). The program is required to read in each line from text.dat. It separates each line into words and stores them somewhere no duplicates are stored. Finally it outputs all the words and how often they occurred. Write the program. **(8 marks)**