



HETAC

ICT

SUMMER 2013 EXAMINATIONS

Module Code: **ICT1714**

Module Description: **Object Oriented Programming 1**

Examiner: **Paul Kelly**

Internal Moderator: **Rory O'Donnell**

Date: **Monday, 22nd July 2013**

Time: **10.00-12.00**

INSTRUCTIONS TO CANDIDATES:

Time allowed is 2 hours.

Answer THREE questions.

Answer QUESTION 1 and any other TWO questions.

Write your answer to question 1 in the booklet.

Save the answers to questions 2 to 4 in the folder

Exam *YourStudentNumber*.

Question 1 – Compulsory – 30 Marks

Using sample C# code

- Explain what an *overloaded operator* is. (6 marks)
- Discuss the advantages/disadvantages of generic Lists compared with arrays. (8 marks)
- Distinguish between *composition* and *inheritance*. (6 marks)
- Explain what *object persistence* is. (6 marks)
- Distinguish between a *class variable* and an *instance variable*. (4 marks)

(30 marks)

Question 2 - 35 Marks

Save the answer to this question as Q2 in the folder ExamYourStudentNumber.

- (a) Write a class called Patient with the following data members:

Fields:

Patient Id
Patient Name
Notes

Notes is a List of strings.

Methods:

A parameterised constructor with a parameter for the patient name. The Id is automatically assigned, starting at 1000001. This constructor also creates an empty List of notes for the patient object.

A method to add a note to a Patient object.

A method to append a Patient object to a text file “patients.txt” using StreamWriter (you must include the statement *using System.IO;* at the top of the class file)

A read-write Property for a patient name.

(29 marks)

(b)

- (i) Test the Patient class developed above in a console app.

- (ii) Construct test data so that the text file “patients.txt” contains the following patient data.

The headings shown in italics are not part of a patient object.

Id: 1000001 *Name:* John Doe

Note1: general checkup 10/11/12

Note2: x-ray 12/11/12

Id: 1000002 *Name:* Mary Murphy

Note1: BP check 15/11/12

(6 marks)

Question 3 - 35 Marks

Save the answer to this question as Q3 in the folder ExamYourStudentNumber.

(a) Write a class called PostalAddress containing the following class members:

Fields:

addressLine1
addressLine2
addressLine3
addressLine4

Methods:

A parameterised constructor.
A ToString method that returns all field values with each separated by a space.

(10 marks)

(b) Write a class called Person with the following class members:

Fields:

First Name
Middle Name
Surname
A PostalAddress object.

Methods:

A parameterised constructor that
(i) trims all leading and trailing whitespace characters from a person's First Name and Surname parameter values
(ii) throws an exception if a person's First Name and Surname parameter values has less than two characters.
A ToString method that returns all field values with each separated by a space.

Properties:

A read-only property for the Surname field.

(20 marks)

(c) Write statements in Main() to test both classes.

(5 marks)

Note: Reuse of code is important.

Question 4 – 35 Marks

Save the answer to this question as Q4 in the folder ExamYourStudentNumber.

Easys is a large retail bookshop that sells magazines and books supplied to them directly by the publishers.

The following data is required to be held for a magazine:

The period of the publication (W=weekly, M=monthly, F=Forthnighly (every two weeks))

The Title

The International Standard Book Number (ISBN), e.g. 979-1-22065-024-6

The Price

The Number Sold This Period

The following data is held for a book:

The Title

The Price

The International Standard Book Number (ISBN)

A Boolean value indicating Hardback or Paperback

The Number Sold To Date

(a) Construct an appropriate class hierarchy with an abstract base class for the above.

When a book or magazine is created:

The number sold is set to 0.

The price is checked and if not greater than 0, the user is prompted for a price and a price is entered from the keyboard until the price entered is greater than 0.

Write a method to extract the publisher code from the ISBN. The publisher code for the ISBN 979-1-22065-024-6 is 22065.

(25 marks)

(b)

Write a console app to do the following:

Construct an array of books objects and an array of magazine objects, some with a price of 0 for which you will prompted to enter a price for.

Input a publisher code from the keyboard and display the book or magazine titles published by that publisher.

e.g. Input a publisher code: 22065

Publisher 22065 has publishes the following books:

.....

or

Publisher 22065 publishes the following magazines:

.....

(10 marks)

Note: Reuse of code is important.

(35 marks)