



QQI

Higher Diploma in Science in Computing

OCTOBER REPEAT EXAMINATION 2014

Module Code: **B8IT052**

Module Description: **Object Oriented Programming 1**

Examiner: **Damien Kettle**

Internal Moderator: **Michael Gleeson**

External Examiner: **Pat Donnelly**

Date: **Monday 6 October 2014**

Time: **14.30 – 16.30**

INSTRUCTIONS TO CANDIDATES:

Time allowed is 2 hours.

QUESTION 1 IS COMPULSORY

Answer any 2 other questions.

Question 1 – Compulsory – 30 Marks

1. What is meant by the three pillars of object oriented programming? Explain each one. **(10 Marks)**
2. Explain the differences between abstract classes and interfaces. Give examples, including appropriate C# code, to show how classes and interfaces are both defined and used **(10 Marks)**
3. What is meant by generic collections in relation to C#? Give an example of how this would be used in code. **(5 Marks)**
4. Explain what is meant by overriding and overloading. Give C# examples for each. **(5 Marks)**

(30 marks)**Question 2 - 35 Marks**

DBS wish to build a new student record system. The following are the details of the entities in the system.

- Person
 - Title
 - First Name
 - Surname
 - Date Of Birth
 - Email
 - Telephone
 - GetFullName()
 - GetContactDetails()
- Course
 - Name
 - Code
 - List of Students
 - List of Lecturers
- Lecturer
 - Inherits from Person class
 - Employee Id
 - Salary
- Student
 - Inherits from Person class
 - Student Id

Provide a console application which caters for the following functionality:

- Adding a new lecturer
- Adding a new course
- Assigning a lecturer to a course
- Adding a new student
- Registering a student on to a course
- Removing a student from a course

(35 marks)**Question 3 - 35 Marks**

You have been approached by the CIO of Dublin Software Solutions Ltd. She has described the following requirements for a prototype she would like you to build for her company. You must provide C# code and a sample console test application for this project.

All employees share the following details except where indicated in the sample data column:

Attribute	Sample
Employee Number	EMP001 (full time employee) CON001 (contractor)
Employee Name	Mr. Ed Murphy
Address	1 Grafton St Dublin 2 Ireland
Telephone Number	01 5151515
Age	55 Years
Gender	Male/Female
Status	Full time Contractor
Manager	CEO Project Manager Software Architect
Title	Junior Software Engineer Software Architect Contractors do not have Titles
Start Date	1 May 2012 – This is the date when the employee or contractor started
End Date	31 May 2012 – This date is only used for contractors to indicate when their contract is finished

In addition we need to be able to determine an employees or contractors monthly wage. For employees we simply divide their year salary by 12. Contractors have a daily rate. We determine how much they get paid based on the number of days they work in a month.

Structure:

Class: Employee

Class: FullTimeEmployee

Class: Contractor

Class: Address

(35 marks)

Question 4 – 35 Marks

Create a C# application which satisfies the following requirements:

1. A class named Library which contains the following properties and methods
 - a. A Catalogue property which contains a list of books
 - i. You must create a class Book with the following details
 1. ISBN
 2. Title
 3. Author
 4. Description
 - ii. You must create a class Books which implements ICollection
 1. You must implement all methods and properties from the interface
 2. You must provide a method to search for a book given its title
 3. You must provide a method to search for a book given its ISBN
 - b. A means by which the user can add a book to the catalogue
 - c. A means by which the user can remove a book from the catalogue
 - d. A means to sort the books by title alphabetically
 - e. A means to sort the books by author, then by title

(35 marks)