



QQI

Higher Diploma in Science in Software Computer Development

Summer 2014 EXAMINATIONS

Module Code: **B8IT057**

Module Description: **Object Oriented Programming 2**

Examiner: **Kevin Coady**

Internal Moderator: **Paul Kelly**

External Examiner: **Pat Donnelly**

Date: *Wednesday 14 May 2014*

Time: *10.00 – 12.00*

INSTRUCTIONS TO CANDIDATES:

Time allowed is 2 hours.

QUESTION 1 IS COMPULSORY

Answer any 2 other questions.

Question 1 – Compulsory – 50 Marks

You have been asked to develop an Employee Management System for a local Dublin business. When the application is run a list of Employees must be displayed to the user in a grid format. The software must allow users to enter details relating to a new Employee in addition to updating existing employees and removing employees from the system.

A sample of the data relating to an Employee can be found in the table below:

<u>First Name</u>	<u>Surname</u>	<u>Phone Number</u>	<u>Role</u>
Joe	Smith	01 1231231	IT Manager
Mary	Jones	091 554433	Programmer
John	Doe	00 44 88776655	Business Analyst

The application must be developed using C#, Windows Forms, SQL Server and ADO.Net. It is not a requirement to build a business or data layer for this question.

You are required to write the following source code:

- I. SQL for all database objects
 - a) SQL Tables **(3Marks)**
 - b) SQL Stored Procedures **(7 Marks)**
- II. Design and layout of your Windows Form.
 - a) Use of buttons or menu items to add, edit and delete an employee and their related screens **(10 Marks)**
 - b) Use of a DataGridView control to display employee details to the user. The following columns must be shown in the grid **(5 Marks)**:
 - i. First Name
 - ii. Surname
 - c) A means to update the DataGridView when an employee is either added, removed or updated. **(5 Marks)**
- III. The connection string used to connect to the database must be stored in an App.config file. **(5 Marks)**
- IV. You are required to make use of ADO.Net objects **(10 Marks)**
- V. Coding standards must be adhered to as well as effective exception handling. **(5 Marks)**

(50 marks)

Question 2 - 25 Marks

A local Music Store has asked you to provide an Album Lookup System. The following is a sample of the data used for an album:

<u>Band Name</u>	<u>Album Name</u>	<u>Number of Songs</u>	<u>Play Length (Minutes)</u>	<u>Release Year</u>
U2	Achtung Baby	12	55	1991
Bruce Springsteen	Born in the U.S.A.	12	47	1984
The Beatles	White Album	30	94	1968

You are required to provide the following:

NOTE you are NOT required to use ADO.Net or store any data in a SQL Database. You can simply hard code sample Albums in your C# code

- I. Provide an object which represents an Album entity. **(3 Marks)**
- II. A Windows form containing a DataGridView which displays a list of albums. **(5 Marks)**
- III. Create a user defined collection named Albums which will store all albums. **(7 Marks)**
- IV. The user will need to be able to filter bands based on text they enter in a textbox provided on the UI. Create a LINQ query in the Albums class created in part III which will accept a query and return a list of albums matching that query. The DataGridView must be updated to reflect the results of the query. **(5 Marks)**
- V. Create a button on the UI which, when clicked, displays a message box displaying the total length of time for all albums in the store. You must use a LINQ query to calculate this. **(5 Marks)**

(25 marks)

Question 3 - 25 Marks

Given the following XML structure:

```
<?xml version="1.0" encoding="utf-8"?>
<Student>
  <FirstName>Mary</FirstName>
  <Surname>Smith</Surname>
  <MobileNumber>123</MobileNumber>
</Student>
```

- I. Create a UI which allows the user to select an XML file for the above from the file system. Your UI should also provide textboxes to display a First Name, Surname and Mobile Number.
(5 Marks)
- II. Using the XML structure above, create C# code to deserialise the document. The data should only be display in the form if it satisfies the following requirements:
(10 marks)

Property	Validation Rule
First Name	Must be at least one character in length
Surname	Must be at least three characters in length
Mobile Number	Must conform to the following pattern nnn-nnnnnnn where -1<n<10. You must use the regular expression <code>^\d{3}-\d{7}\$</code>

- III. Provide a means in which the user can save the data to a new XML file **(10 marks)**

(25 marks)

Question 4 – 25 Marks

- I. Write a note on TWO of the following topics in relation to Threads: **(10 Marks)**
 - a. Thread Priority
 - b. Join and Sleep
 - c. Thread Blocking
- II. Create a Windows form which iterates through an array of strings and displays each string in a text box for 5 seconds. After the 5 seconds have elapsed the next element in the array should be displayed for another 5 seconds, until all the elements in the array have been displayed.
 - a. You should use a textbox, progress bar and background worker control as part of your design. **(3 Marks)**
 - b. When the application loads, it should create a thread to process each string entry in the string array. The thread should pause for 5 seconds after each element of the array has been assigned to the text property of the textbox. **(7 marks)**
 - c. You should update the progress bar to indicate the percentage of the array has been processed at any given time **(5 marks)**

(25 marks)