Dublin Business School
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QQI
HIGHER DIPLOMA IN SCIENCE IN COMPUTING

FINAL EXAMINATIONS
SEPTEMBER 2017 INTAKE

Module Code: **B8IT117**

Module Description: **Object Orientated Programming**

Examiner: **Dr Shazia A Afzal**

Internal Moderator: **Mr Rory O' Donnell**

External Examiner: **Dr Paul Stynes**

Date:29th of January 2018
Time: 10:00-12:00

INSTRUCTIONS TO CANDIDATES

Time allowed: 2 hours

Total: 100 marks

QUESTION 1 IS COMPULSORY (30 marks)

Answer any 2 other questions (35 marks each)

Question 1 – Compulsory – 30 Marks

a) Explain the difference between overloading and overriding by giving an example of each of them.

(10 marks)

b) What are access modifiers? Briefly describe five access modifiers in C#?

(12 marks)

c) List any four differences between an abstract class and an interface in C#.

(8 marks)

(Total: 30 marks)

Question 2 - 35 Marks

A company operates several burgers stands throughout town. Create a class BurgerStand with the following specifications:

a) Two properties as given below:

- BurgerStand's Id number
- No of Burgers sold by a stand in a day.

(4 marks)

b) A static property that tracks the total number of burgers sold by all burger stands.

(5 marks)

c) A constructor that allows a user of the class to initialise both values (ID and No of burgers sold).

(4 marks)

d) A method named JustSold that increments the number of burgers the stand has sold by one. The idea is that this method will be invoked each time the stand sells a burger so that the company can track the total number of burgers sold by the stand.

(4 marks)

e) Implement the interface IComparable and write the CompareTo for sorting the BurgerStands by the highest number of burgers sold.

(4 marks)

f) Write another method ToString() that shows all the details of the burgers sold by each stand and the total number of burgers sold by all stands.

(4 marks)

g) Write a test class that creates a list of three BurgerStand instances, demonstrates the use of JustSold Method and shows the details of each burger stand. Also display the total number of burgers sold by all stands. A sample run is shown below:

```
Stand1 selling a burger
Stand3 selling a burger
Stand1 selling a burger
Stand2 selling a burger

Burgers Sale Details
Stand No 3
Burgers Sold: 6

Burgers Sale Details
Stand No 1
Burgers Sold: 4

Burgers Sale Details
Stand No 2
Burgers Sold: 2

Total Burgers Sold by all Stands: 12
```

(10 marks)

(Total: 35 marks)

Question 3 - 35 Marks

A local bank offers its customers two kinds of account – a regular account and a gold account. The two types of account have some common and some distinctive features. The bank management have approached your team to develop a software for them. As part of team, you are required to write the following classes.

a) A class Account with the following specifications:

- AccountName (Property)

- Address (Property)
- Balance (Property)
- Interest Rate (An abstract read only property)
- Overdrawn Limit (An abstract read only property)
- A constructor to initialise Account Name, Address and Balance
- A method named Deposit (abstract method)
- A method named Withdraw (abstract method)
- A ToString() method to return the account details

(12 marks)

b) A RegularAccount class to inherit from the Account class with the following specification:

- Implementation of all members that are required in the inherited class

(8 marks)

c) A GoldAccount class that inherits from the Account class with the following specification:

- Implementation of all members that are required in the inherited class
- A read only property TransactionFee – Transaction fee of €2 is charged for each transaction whenever a deposit or withdrawal transaction is made.

(8 marks)

d) Write a test class to create two objects, one of type RegularAccount and one of type GoldAccount and display their details. A sample run is shown below:

```
Account Details...
Account Name: John Murphy
Address: Dublin 2
Balance: 200 euros
Interest Rate: 5%
Overdrawn Limit: 0
```

```
Account Details...
Account Name: Orla Kelly
Address: Dublin 8
Balance: 400 euros
Interest Rate: 6%
Overdrawn Limit: 10000 euros
```

(7 marks)

(Total 35 marks)

Question 4 – 35 Marks

Develop a console application in C# with the following specifications:

a) An Interface IPayable with the following members:

- A method named PaymentAmount()

(5 marks)

b) An Invoice class that implements IPayable with the following members:

- ItemNo
- Description
- Quantity
- PricePerItem
- A method PaymentAmount that returns the Invoice details
- And a method ToString() to return all the details of a book.

(10 marks)

c) An Employee class that implements IPayable with the following specification:

- Name
- GrossPay
- TaxRate of 20%
- A method PaymentAmount that calculates NetPay and then returns MonthlyPay from the NetPay

- A ToString() to display all details of an employee.

(10 marks)

d) A test class that creates a list of IPayable objects. Include one object from Invoice and one from the Employee class. Display the details of each object in the list. A sample run is given below:

```
Employee Details...
Name: Peter Smith
Gross Pay: 35000
Monthly Pay: 2333.33

Invoice Details..
Item No  Description     Quantity        Price
item01    Item 1           3               56
.....................................................
Total Price: 168
```

(10 marks)

(Total 35 marks)

END OF EXAMINATION