



Higher Diploma in Science in Computing

July 2017 EXAMINATIONS

Module Code: **B8IT117**

Module Description: **Object Oriented Programming**

Examiner(s): **Paul Laird**

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Date: 24th of July 2017

Time: 10:00-12:00

INSTRUCTIONS TO CANDIDATES:

Time allowed is 2 hours.

**QUESTION 1 IS COMPULSORY (30 marks);
Answer any 2 other questions (35 marks each).**

Question 1 – Compulsory – 30 Marks

a. Explain the following by providing appropriate examples for each of them.

- i. Constructor Overloading
- ii. Polymorphism
- iii. Encapsulation
- iv. Access Modifiers

(20 marks)

b. Differentiate inherited and polymorphic methods using a code example of each.

(10 marks)

(Total: 30 marks)

Question 2 - 35 Marks

a. Create a class called Pallet that a vegetable wholesaler might use to represent a batch of vegetables. A pallet should include five pieces of information as instance variables

1. a produce ID (type int)
2. a produce description (type string)
3. a batch ID (type int)
4. a net weight in kg (type decimal)
5. and a price per kg (decimal)

For the Weight and Price, if the value passed on to the setter is negative, an exception must be thrown.

(12 marks)

b. The class must have a constructor which initialises all values.

(3 marks)

c. The class must have a method `getCostOfPallet()` which returns as a decimal the value of the produce on the pallet determined by the weight times the price per kg.

(8 marks)

d. A static method `getProduceTotalCost(int ProduceID, List<Pallet> pallets)` should be provided, which returns, as a decimal, the sum of the value of pallets in the list containing that produce.

(12 marks)

(Total: 35 marks)

Question 3 - 35 Marks

- a. Develop a console application named as TeamManager in C#. To develop this application, write the following classes:

- a. An Employee class with the following properties:

- i. PPSN
- ii. Name
- iii. Salary (modifiable)

and a method ToString() to return all the details of an employee.

(10 marks)

- b. A Team class that stores details of employees in the team, and the team leader. This should have methods:

- i. Add
- ii. Remove (throw exception if not present)
- iii. toString() which lists the members in order of salary

(15 Marks)

- c. A TestProgram class which uses a loop and menu to allow the methods to be selected and called, or quit.

(10 Marks)

(Total: 35 marks)

Question 4 - 35 Marks

A Bank wishes to create a class for handling customer accounts, and wishes to test them thoroughly.

- a. The class should hold:
 - 1. Customer Name
 - 2. Account Number (set on account creation, not settable)
 - 3. Balance (decimal amount of money in account, not settable)
- b. and should provide methods
 - 1. bool lodge (increasing the balance by the decimal argument)
 - 2. bool withdraw (decreasing the balance by the decimal argument)
- c. both of which take a decimal, and must throw an ArgumentException if a negative argument is provided, while
- d. withdraw should return false and leave the balance unchanged if the balance would be negative following a withdrawal

(17 Marks)

- e. Write a test class TestWithdraw which has three test methods, testing the withdraw method in terms of the requirements in subsections b2, c and d respectively

(3*6 Marks)

(Total : 35 Marks)