THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING
DIPLOMA IN INFORMATION SYSTEMS & TECHNOLOGY

043

ECX 3162 – INTRODUCTION TO OBJECT ORIENTED PROGRAMMING

FINAL EXAMINATION                                              CLOSED BOOK

Date: 10<sup>th</sup> July 2016                                      Time:  9.30 – 12.30

Answer question one (Q1) and two other questions

## Q1

a) Define the following terms:

    i.    Object

    ii.   Class

    iii.  Superclass

    iv.  Subclass

    v.   void                                                         [10 marks]

b) A University wishes to keep information about its students. The proposed Student class has the following instance variables:

studentNo: String

studentName: String

dateOfBirth: Date

A class variable is also required called noOfStudents, which will be incremented each time a Student instance is created. Write java code to perform the following.

    i.  Show the declaration of the Student class including any setter and getter methods.

[20 Marks]

    ii.  Declare a constructor which increments the class variable appropriately

[10 Marks]

**Q2**

(a) Name and explain the two ways to create polymorphism in a programming language

[12 marks]

(b) Distinguish between the different types of access modifiers and explain clearly their use in programs.

[12 marks]

(c) What is the difference between a variable in a class that is declared static and one that is not?

[6 marks]

**Q3**

(a) Write down the class 'Rectangle' containing the following:-

   i. Attributes length and width

   ii. A no-argument constructor to initialize both the length and width

   iii. An overloaded constructor to initialize the length and width by passing values

   iv. Set and get methods for both the length and width

   v. Method to calculate the area of the rectangle       [20 marks]

(b) What is garbage collection in java?       [4 marks]

(c) Explain how you can make java objects eligible for garbage collection using a code snippet.

[6 marks]

**Q4**

(a) Explain the behavior of "String" in java compared to primitive data types.

[6 Marks]

(b) What is bytecode? Explain its usefulness while translating a Java program in a wide variety of environments.       [6 marks]

(c) Write a java program that prints the prime numbers between 100 and 5000.

[18 marks]

-- End --