The Open University of Sri Lanka
Department of Electrical and Computer Engineering

ECX3163 – Introduction to computing

Final Examination 2016/2017 **Closed Book Test**

Date: 22nd July 2017 Time: 09.30-12.30

*Answer **questions 1** and **2** (Part A) and **two** other questions (from Part B). Write your answers clearly.*

Part A – 60 marks

Q1. You decide to buy a desktop computer to be used for your educational use at home. As you have gained eligibility in 'Introduction to computing' you decide to assemble a PC to suite your needs.

a) Describe briefly 5 main educational tasks for which you will use this machine.
b) Identify special software and any additional hardware that is needed for each of the above 5 tasks separately.
c) Write a specification for your computer so that it can handle all the above tasks.
d) Describe types/versions and approximate cost for **six** main hardware items and for **four** main software from above specification. (3-4 sentences for each)
e) After about a year you find that you are running short of storage space and decide to add another hard disk. Describe briefly the steps to follow when installing an ***additional*** hard disk and making it ready for use.

(40 marks)

Q2. There is children's game where each player is allowed to draw 5 balls from a closed container. There are balls of three different colours – red, yellow, blue – in the container. A red ball is worth 3 points, a yellow ball 2, and a blue ball one point each. The system automatically detects the colour of each ball drawn, and the display board provides updated information of the total points after each draw. It displays the message "Your turn is finished" after 5 draws. It also displays the final points tally.

Draw a flowchart to describe an algorithm to facilitate the display using standard shapes. Sate any assumptions you may make.

(20 marks)

Part B – Answer any 2 questions – 20 marks each

Q3. Solve the following. *Write all relevant intermediate steps*.

a) Convert 11010111011011_2 to a hexadecimal value.

b) Convert 115.375_{10} to a binary value.

c) Perform the following **binary** operations.

i) $1011001_2 \times 1111_2$ ii) $1001011_2 \div 1100_2$

d) Find the value of m if $234_m = 279_{10}$

e) Subtract 4 from 2, using two's complement representation. [2 – 4]

Q4. A system allows input of single-digit non-negative integers (0-9). The output for digits 0, 2, 5, 7, and 8 is 'high' but is 'low' for all other digits.

a) Write the truth table for this system.

b) Simplify the resulting function using a Karnaugh Map.

c) Draw the circuit for the simplified function using standard gates.

Q5.

a) i. What is the function of an Assembler?

ii. Describe briefly the 3 types of Assemblers.

b) i. What is the function of a Compiler?

ii. Describe the difference between a cross-compiler and a self-compiler.

c) i. What are the three main levels of programming languages?

ii. Describe the differences of these levels.

d) Describe briefly the fetch-execute cycle of a microprocessor.

e) i. Name and describe briefly 2 insider threats and 2 outsider threats respectively to computer security.

ii. Describe briefly 5 measures to ensure computer security.