The Open University of Sri Lanka
Department of Electrical and Computer Engineering
Diploma in Technology

ECX3233 Communications & Information Technology
Final Examination 2009/2010 **Closed book exam**

Date: 12th March 2010 Time: 0930-1230 hrs.

*This paper contains two parts. Question 1 from Part A is **compulsory**. You need to answer any **two** questions from part B.*

Part A (60 marks ≈ 2 hours)

1. The Open University has Elementary Computer Labs (ECLs) in 19 of its centres. You, as a student, have unlimited access to computers of these centres.

(a) Propose a specification for the student machine to be used in an ECL. Include all important software and hardware requirements. Justify your recommended choices.

(b) Assume that there are about 25 student machines per ECL. It is recommended that some resources are shared amongst the student machines, so as to reduce expenses. What are the resources that you recommend to be shared? Explain.
(c) What is the network topology that you recommend for above task? Justify your answer.
(d) What are the additional resources needed for the networking?

(e) Internet facility is requested by the students to the ECL. Why would you need the internet?
(f) What additional requirement would need to be fulfilled to provide internet connection?
(g) What are the problems/dangers associated with the internet? How can the ECLs overcome these problems?

(h) Now that all students are provided with internet access, what additional services/facilities associated with internet would you expect from the OUSL?

Part B (20 marks per question ≈ 30 minutes each)

2. Perform following operations. *No marks will be awarded if intermediate steps are not shown.*

a) Convert $13A_{16}$ to a decimal value.
b) Convert 1025_{10} to an octal value.
c) Convert 105.625_{10} to a binary value.
d) Perform the following **binary** operations.
i) $1101101_2 \times 1111_2$ ii) $10001101_2 \div 1100_2$
d) Find the value of m if $235_m = 439_{10}$.
e) Subtract 6 from 3, using two's complement representation. [(3) – (+6)]

3. (a) What is a LAN?

(b) What are most common LAN topologies? Sketch and describe three of them.

(c) What are the main differences between an Ethernet and a Token Ring network? Describe.

(d) Describe the operation of a Token Ring network. How does it self-maintain?

4. (a) Short-wave communication is a very cheap way communicating in global scale. Explain how thi possible.

(b) Short-wave communication realise mainly on Amplitude Modulation to get messages across. Sketch, on the same graph, an information signal and the signal amplitude modulated with the previous signal.

(c) You are listening to an AM Radio broadcast on your radio. Explain this process on-hand a simple block diagram. Indicate any modulation, filtering, medium of transmission relevant to each stage.