

ECX3163 – Introduction to computing

Final Examination 2014/2015

Closed Book Test

Date: 05th October 2015

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. The Open University is to upgrade its Study Centre at Polonnaruwa to a Regional Centre. You are appointed as an advisor in upgrading computer lab(s) at this new regional centre.
- The Campus expects to cater with three programs: English, Law, and Information Technology. The expected annual intake is about 50 students each for Law and IT programmes, and 100 for the English programme.
- The original computer lab comprises of 10 P4 and 10 Dual-core computers.
- Describe briefly 5 purposes each that students of each program may use the computer lab.
 - How many computer labs do you propose? Justify your answer.
 - How many computers do you propose to purchase, and how many can be retained from old stock, for each lab? Justify your answer.
 - What are the main hardware that you propose for a computer at each lab? Describe types/ specifications for six main items.
 - What are the main software necessary for each lab? Describe each item briefly.
 - A general purpose computer needs to be upgraded after about 3 - 5 years. Name **four** main hardware components most likely to be replaced within 5 years. Give the reasons for your choices.
 - You intend to install the new components to the computers in the lab(s), with the help of the students. Give **three** important practical precautions to take when upgrading a computer.
 - What about software upgrades? What are the main concerns regarding software?
 - Describe briefly the steps to follow when installing an **additional** hard disk and making it ready for use.

(40 marks)

- Q2. You are to write an algorithm to find any prime numbers (no positive divisors other than 1 and itself) out of **five** numbers that are fed into the system. Present your algorithm with the help of a flowchart.
- You may assume that these numbers are integers **between 1 and 25**. One is not a prime. State any other 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 $25C_{16}$ to a decimal value.
- b) Convert 123.675_{10} to a binary value.
- c) Convert 1100101101001_2 to a hexadecimal value.
- d) Perform the following **binary** operations.
 - i) $1010101_2 \times 1111_2$
 - ii) $1100011_2 \div 1100_2$
- e) Find the value of m if $249_m = 399_{10}$
- f) Subtract 3 from 2, using two's complement representation. [2 – 3]

Q4. a) You are to write an algorithm to sort **three** numbers according to their value.
You may assume that these numbers are positive integers. State any other assumptions you may make.

Present your algorithm with a flowchart using standard shapes.

- b) In the course **ITE3163** offered by the university the students take part in four activities. All activities are given marks out of 100, and the continuous assessment (CA) is calculated by averaging the marks of 3 best activities. (Average of 3 highest marks) Use your flowchart from above a) to calculate and present the CA marks for the 50 students who are enrolled to **ITE3163** this year.

Q5.

- a)
 - i. What are the three main addressing modes used at processor level programming?
 - ii. Use three suitable examples to describe each of those modes.
- b)
 - i. What are the two main types of software?
 - ii. Describe two main tasks for each of the two types.
- c)
 - i. What are the three main levels of programming languages?
 - ii. Describe the differences of these levels.
- d)
 - 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.