



THE OPEN UNIVERSITY OF SRI LANKA
B.Sc. DEGREE PROGRAMME: LEVEL 03
DEPARTMENT OF COMPUTER SCIENCE
FINAL EXAMINATION: 2016/2017
CPU1140 : FUNDAMENTALS OF COMPUTERS
DURATION: TWO HOURS (2 HOURS)

Date: 01st August 2017

Time: 9.30 a.m. – 11.30 a.m.

Instructions

- Answer FOUR questions ONLY.
- Each Question carries equal marks.

Q1).

(a) Answer the following questions in short.

- i. Describe the main difference between *data* and *information* by using a suitable system.
- ii. Describe the terms *hardware* and *software* using examples.

(b) Computers can be classified into generations according to the main electronic component (technology) used in the Central Processing Unit (CPU). State the technology used in the following generations.

- i. First
- ii. Second
- iii. Third

(c) If a *desktop computer*, *tablet PC* and a *laptop computer* are available, suggest with **justifications** the most suitable computer for each of the following situations:

- i. The University librarian lending books using software
- ii. Travelling salesman taking orders from shops

(d) What are the three (03) main components of a Central Processing Unit (CPU) of a typical computer? List the main functions of these three components.

Q2).

(a) Answer the following questions related to system software and application software.

- i. Briefly explain the main difference between application software and system software.
- ii. Provide an example each for application software and system software.

Classify the following software either as "system software" or "application software."

- iii. Linux
- iv. Word Processor
- v. Web Browser

(b) Answer the following questions related to Operating Systems.

- i. Operating systems contain utilities for tasks such as formatting disks. Write down one other operating system utility and its purpose.
- ii. What are the six (06) basic tasks of an operating system?
- iii. Briefly explain the four (04) operating system types by giving suitable examples.

(c) A text editor is a type of programming software used for editing plain text files. Describe four (04) common features of a text editor.

Q3).

(a) Input and Output devices are any hardware used by a human operator or other systems to communicate with a computer. As the name suggests, input/output devices are capable of sending data (input) to a computer and receiving data from a computer (output).

- i. Briefly explain three (03) types of input devices and give at least three (03) examples for each type.
- ii. Name three (03) types of printer technologies with examples.
- iii. Discuss the differences between *CRT (Cathode Ray Tube)* and *LCD (Liquid Crystal Display)*.
- iv. Compare the three types of audio output devices (speakers, headphones and headset).
- v. Explain the reader types of barcode readers.

(b) Most digital photocopiers work by "*adhering toner to a light sensitive print drum, then using static electricity to transfer the toner to the printing medium to which it is fused with heat and pressure.*"

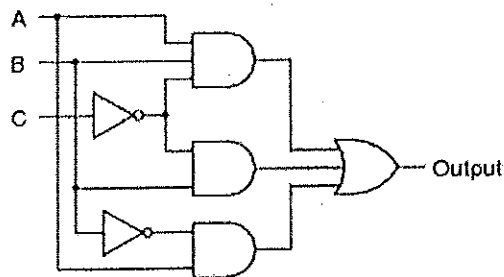
- i. Identify the most suitable printer for the above described function.
- ii. Explain the functionality of a printer that you mentioned in 'i.' by giving suitable steps.

Q4).

- (a) Why do we need Binary in computers? Give two (02) reasons.
- (b) Convert the following decimal numbers into equivalent binary numbers.
- i. 245_{10}
 - ii. 17.625_{10}
- (c) Convert the following decimal numbers to *binary* numbers and use *two's complement* representation to perform the operation, using 8 bit representation.
- $$34_{10} - 27_{10}$$
- (d) Convert 1101110_2 in binary into *hexadecimal* and *octal* representations.

Q5).

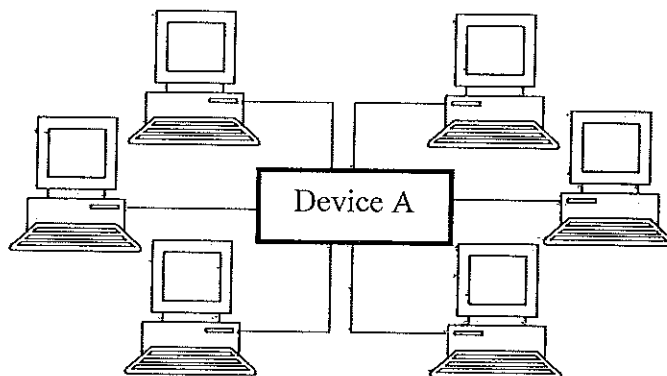
- (a) Construct the truth tables for the following operators.
- i. AND
 - ii. OR
 - iii. NOT
-
- (b) Illustrate the traditional symbols to represent each of the logic gates in 5 (a).
- (c) Simplify the following logic circuit.



- i. Write the Boolean expression of the above logic circuit.
- ii. Reduce the expression you wrote in 'i.' to its simplest form using the Boolean algebra rules.
- iii. Construct the logic circuit for the expression obtained in 'ii.'

Q6).

- (a) A lab technician is setting up a computer network with six computers in a small room as shown in the diagram. He uses Unshielded Twisted Pair (UTP) cables to connect Device 'A' to the computers through the Interface Component 'B' which is fixed inside the computers.



- i. Name the device labeled as 'A'.
- ii. What is the area network type that technician is planning to setup?
- iii. What is the network topology that is shown in the diagram?
- iv. Name the interface component 'B.'
- v. Write two advantages of setting up a computer network instead of using these computers as standalone machines.

- (b) Identify each of the following components in the URL below.

<http://myoussl.ou.ac.lk/indx/main/fp.aspx>

- i. Protocol
- ii. Host computer name
- iii. Top-level domain name
- iv. Directory name
- v. File name

- (c) Briefly explain each of the following terms in networking and communication.

- i. Firewall
- ii. Web browser
- iii. Direction of transmission
- iv. The three variants of internetwork
- v. IP Address

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