FETAC

Further Education and Training Awards Council

Comhairle na nDámhachtainí Breisoideachais agus Oiliúna

Further Education and Training Awards Council

Computer Architecture & Systems C20012

April 2012

Duration: Two Hours

<u>**INSTRUCTIONS TO CANDIDATES**</u>**:**

*Answer any **ten** questions from Section A*

*Answer any **two** questions from Section B*

All questions in each section carry equal marks

Return this exam paper when finished along with your answer book

This written exam counts as 40% of the total module

NAME (PRINT):_____

PPS NUMBER:_____

DATE:_____

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Senior
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Section A (20%)

Answer any ten questions. All questions carry equal marks (2 marks each). If you answer more than ten questions the best ten marks will be chosen.

1. How many Megabytes are in a Terabyte?

    Learner may use 1000 or 1024: 1024 * 1024 = 1048576 (or 1,000,000)

2. What is the **ALU** and what does it do?

    Arithmetic Logic Unit: does essential math in the processor

    1. Convert the binary value **0011 0110** into decimal.

54 = 0 + 0 + 32 + 16 + 0 + 4 + 2 + 0

    2. What is cache RAM and what is it used for?

Cache RAM (Randon Access Memory) is faster that normal RAM used to speed up access to programs in memory.

3. What do the letters **RGBA** stand for?

    RGBA= Red, Green, Blue, Alpha (transparency value)

4. Where is the instruction pointer and what does it do?

    Used by the CPU to keep track of which program instruction is being executed.

5. What is the difference between **FTP** and **SFTP**?

    FTP=File Transfer Protocol; FTPS is same but S=Secure; difference important because data is encrypted with FTPS.

6. What is the purpose of the Data Protection Act? Outline two provisions of the Act.

    Purpose to give citizen rights over their own data; rights include: right to data security, right to view data, right to amendment if data wrong, data only used for purpose obtained

7. What is the name of the Unix superuser? What is the inherent danger of being the superuser as distinct from any other user?

    root is super-user; danger is that super-user can accidentally or otherwise

destroy anything/everything.

8. What is the Unix command to make a file executable?

   chmod +x filename

9. List two benefits of email over traditional mail.

   Faster, cheaper

10. What is the primary difference between serial and parallel devices? Give an example of each device.

    Serial devices process/transmit 1 bit of data at a time; parallel does multiple bits at once.

    USB devices are serial, some printers (not USB) are parallel

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Section B (20%)

*Answer any **two** questions. All questions carry equal marks (10 marks each). If you answer more than two questions the best two marks will be chosen.*

1. (a) Name one internal and one external bus. Discuss the purpose of each one and give examples of devices that can be connected to each.

External: eg USB or SCSI; Internal: eg PCI or SCSI. (Universal Serial Bus, Peripheral Component Interconnect, Small Computer Systems Interface).

Purpose of buses to allow communications between devices and CPU, but using wiring shared between the devices. This saves cost on manufacturing, but has implications for how devices will operate, and how many devices can go on the bus.

Learner may draw diagram to assist explanation.

4 marks

(b) Describe and discuss the steps you would follow to provide internet connectivity as well as a reliable wireless signal in a small office. Ensure you:

- List any hardware, software and services that are required.
- List other key issues that you feel would have to be considered.

Hardware includes network cards for computers, router/hub, broadband modem, wireless access point. Software includes TCP/IP (normally provided by the operating system), browser. Learner MUST mention ISP (Internet Service Provider)

Consideration should be given to security, as wireless involves transmitting data by radio and can be eavesdropped. Passwords should be used for all systems, including wireless.

6 marks

2. (a) List 4 common functions of a modern operating system. Discuss two of these in detail explaining how each function is achieved and the benefit to the user.

Resource accounting: allow user to see how much disk/RAM in use, what programs hog CPU etc.

Security: control access to files, features by password

Process control: allow for termination of misbehaving programs

Hardware drivers: allow programs to use hardware more easily, by providing a pre-written software interface.

(b) Many applications are developed under the Open Source model. List 3 of these that are freely available both for Linux and Microsoft Windows; then discuss them under the headings of:

- Benefit to an organisation of the software
- Ease of use
- Features and functions

Learner may list any three software packages, including ones already mentioned in part (a), as long as both are available for Linux/Windows. Eg, FileZIlla, LibreOffice, kwrite (plain text editor), GIMP (image editor). Benefits include lower cost of ownership, ability to change and improve the applications. Observations on ease of use may be personal, and may reference the advantage of many contributors to an open source project. Features and functions may include any the learner recalls.

3 marks

3. (a) Draw a block diagram of the main components on a computer motherboard; write a note on each item explaining its function, and what part it plays in normal operation of the computer.

Learner should reproduce diagram similar to one shown in class, with blocks for RAM, CPU, Hard drive, Drive Controllers, Audio, Video etc, suggesting by arrows how each connects to the CPU for control.

8 marks

(b) Is the processor speed of the CPU alone a good indicator of system performance? If not, what might have a greater or equal effect on performance and why? Give your reasons.

No, as CPU not only factor affecting performance. Learner should mention at least 1 other item contributing to performance, eg RAM (more is faster), Disk (more free space, with less fragmentation is faster). Learner may give personal experiences.

2 marks