The Open University of Sri Lanka
B. Sc. Degree Programme – Level 03
Department of Mathematics and Computer Science
Final Examination 2013/2014
CPU1140: Fundamentals of Computers

Duration: **Two hours only (2 hours)**

Date: 20.06.2014	Time: 9.30am-11.30am

Answer FOUR (04) questions ONLY

Q1.

    a. State whether the following statements are **TRUE** or **FALSE.** If it is false, give the reason.
        i.   **ENIAC** is the first General-Purpose Electronic Computer.
        ii.   The **Mark II** used mechanical telephone relay switches to store data on punched cards.
        iii.   The **palmtop** is a type of hand-held computer that is specifically designed to provide PIM functions.
        iv.   A **workstation** is a powerful, high-end Mainframe. It contains one or more microprocessors.

    b. Write **short answers** for the following questions.
        i.   With regard to computer environment, specify **04** important factors.
        ii.   Together with other computer scientists, **von Neumann** designed and built two computers, name them.
        iii.   Computers can be divided into five generations depending upon the **technologies** they use. What are these technologies?
        iv.   There are several types of **Personal Computers,** Specify **04** of them.

    c. Write **short notes** on the **Microcomputers** and **Minicomputers** including their **performances** and **differences.**

    d. What are the **important factors** we should consider when buying a computer for a graphics designing?

Q2.

    a. State whether the following statements are **TRUE** or **FALSE.** If it is false, give the reason.
        i.   Software that is stored in **ROM** is often called **firmware.**
        ii.   **RAMs** are **non-volatile.**
        iii.   Capacity of a single side **DVD** is equal to **671088640 bytes.**
        iv.   **Paging** enables faster access to the data than regular **DRAM.**

b. Write **short answers** for the following questions.
  i.   Specify **04** types of **ROMs**.
  ii.   A **CD** can store up to 74 minutes of music (CD quality stereo), so **calculate** the total amount of **digital data** stored on a CD. (Assume that the sample rate of the CD quality mono sound is 44100 byte/s).

c. Briefly **describe** the following components.
  i.   Internal bus system of a computer
  ii.   Multi-core processors
  iii.   Optical storage devices

Q3.

a. State whether the following statements are **TRUE** or **FALSE**. If it is false, give the reason.
  i.   The **trackball** was invented in **1952**.
  ii.   **3Dconnexion** is a line of human interface devices for manipulating and navigating computer-generated 3D imagery.
  iii. **True Color, SVGA** system uses **24 bit** color Bit-Depth.
  iv.   A single **USB port** in a computer can support up to **255** separate devices, with the use of multiple **USB hubs**.
  v.   A **VGA** connector as it is commonly known as **DE-15**.
  vi.   **HDMI** was produced in **2003**.

b. Write **short answers** for the following questions.
  i.   Specify **04** examples for the **Composite devices**.
  ii.   **Biometric identification** uses features that are unique to an individual user. List **02** of them.
  iii.   Specify **02** properties of **USB connectors**.

c. Write **short notes** for the following topics.
  i.   **CRT** and **LCD** monitors
  ii.   **Dot-Matrix** printers

Q4.

a. State whether the following statements are **TRUE** or **FALSE.** If it is false give the reason.
  i. **POST** checks the **CPU, Memory** and **Basic input-output systems (BIOS)** for errors and stores the result in a special memory location.
  ii. **BIOS** are sometimes called as **firmware.**
  iii. **Device drivers** are **hardware-dependent** and **operating-system-free** software.
  iv. **Web browsers** are the most commonly used type of **SMTP** user agent.

b. Write **short answers** for the following questions.
  i. In most general sense, the operating system's tasks fall into **six** categories, Specify **04** of them.
  ii. Specify **04** examples for **Utility Software.**
  iii. Operating system can be classified according to the **task** and the **user access,** Specify example for the **03** types of Operating systems.
  iv. List **04** example for the free **Unix-like** operating systems.

c. Write **short notes** for the following topics.
  i. Assembly and High Level Languages
  ii. Server-Oriented operating systems

Q5.

a. State whether the following statements are **TRUE** or **FALSE.** If it is false, give the reason.
  i. A unit of **four bits,** or **half an octet,** is often called a **nibble.**
  ii. The value 2^{50} is referred to as **Zetta.**
  iii. **Two's complement** value of the decimal -7 is **1001.**
  iv. The **IEEE 754 standard specification** defines a **32 bit floating-point** format.

b. Convert the following **decimal** numbers into their equivalent **octal** and **hexa-decimal numbers.**
  i. 324
  ii. 75

c. Using **two's complement** perfume the following binary arithmetic.
  i. 324 - 75
  ii. -75 - 324

d. Design a logic circuit (Use only **AND**, **OR** and **NOT** gates) to implement the following equation.

$$F = A'B'C' + AB'C' + A'B'C + ABC$$

e. Represent the above circuit using only **NAND** gates.

Q6.

a. State whether the following statements are **TRUE** or **FALSE**. If it is false, give the reason.
   i. **Comsat** is an artificial satellite, stationed in space for the purpose of telecommunication.
   ii. In **asynchronous transmission**, groups of bits are combined into frames and frames are sent continuously with or without data to be transmitted.
   iii. **Hubs** operate using a broadcast model and **switches** operate using a virtual circuit model.
   iv. Standard security practices dictate a "**default- allow**" firewall rule set.

b. Write **short notes** on the following by giving at least **two (02)** suitable examples.
   i. Internet protocols
   ii. Client Server Networking

c. What is meant by a **Computer Network Topology**? Name **three (03)** different **topologies** and explain their features by giving **two (02) advantages** and **disadvantages** for each of them.

d. You are required to design a simple network. The network consists of **10 computers** including a **file server** and a **print server.**

   i. Create a hardware list to implement the network.
   ii. Briefly explain **configuration steps** for the above network (specify example for the IP address and subnet).
   iii. Describe a way to provide internet facilities to the network

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