COMPUTER STUDIES NOTES

FORM 1

**KEYING DEVICES**

A keying device is used for typing letters, numbers and symbols as a means of entering data and commands into the computer. Examples of keying input devices are keyboards and keypads. Keypads are buttons arranged in a block which usually bear digits and other symbols but not a complete set of alphabetical letters. They are found on calculators, ATMs, Microwaves and other electronic devices.

**POINTING DEVICES**

Pointing devices control the position of the cursor or pointer on the screen and allow the user to control or select objects on the screen. Examples include :
You are most probably familiar with the mouse. It is a device that is moved on a flat surface to direct and control a pointer on the computer display screen.

**Trackball**

A trackball is a movable ball on top of a stationary device that is rotated with the fingers or palm of the hand. (also referred to as trackerball)
A trackball may appear on the keyboard of portable computers. In some cases, it may be built into the right side of the screen.

**Joystick**

A joystick consists of a vertical handle like a shaft lever mounted on a base with one or two buttons. It is operated by tilting the joystick to the corresponding direction of the cursor motion. Joy sticks are mainly used in video games, computer aided designs and computerized robot systems. Special joysticks maybe used by people with special needs.

**Touchpad**

Touchpad is a small flat surface over which to slide the finger, using the same movement as you would with a mouse. Many portable computers and desktop computers now include touchpad built into the keyboard.

**A notebook's touchpad**

**Light Pen**A light pen is a light-sensitive pen-like device, connected by a wire to the computer. The pen has a photo sensor at the tip, that responds to the light emitted from the screen. They are used by engineers, graphic designers and illustrators to draw accurately.

**Digitizing Tablets**A digitizing tablet consists of a tablet connected to a pen-like device with which the user sketches and draws images. The tablet contains electronics that enable it detect movement of the cursor or pen and translates the movements into a signal that is send to the computer. It enables the user to do shadings similar to those artists achieve using a pencil, pen or paint. They are used in graphic design, computer animation and engineering.

**Pen-Based Systems**Pen-based computer systems use pen-like devices to enter handwriting and marks into a computer.

**Smart Boards**It is a large touch-controlled screen that works with projector and a computer. The projector throws the computer's desktop image onto the interative white board which acts both as an output and input device. A user can write on a smart Board using digital ink or by using a finger to control computer application by pointing, clicking and draging.
Smart boards are also used to show video clips and when one wants to practice handwriting.

**Practice Exercise**1.From the following list, select by placing a tick next to the devices that are considered non-keyboard source data entry devices
a. Voice-Recognition devices
b. Video input devices
c. Light pen devices
d. Digitizing tablets
2.List three types of scanning devices

**Answers**1 a. Voice-Recognition devices ü
b. Video input devices ü
2 a. Optical Mark Readers
b. Image Scanners
c. Optical Character Reader
d. Magnetic Ink Character Reader

**SCANNING DEVICES**

Scanning devices translate hardcopy images of text, graphics, objectsand photos into digital format which can be processed, stored, displayed and transfered to another a computer or device.

**Bar Code Readers**Bar code readers are scanners that translate bar code symbols (vertical zebra-striped marks you see on most manufactured retail products) into digital form. They are commonly used in retail outlets such as supermarkets and bookshops.

**Magnetic-ink Character Recognition (MICR)**MICR translate magnetic ink into digitized signal. Mainly used in the banks to read numbers printed at the bottom of bank checks and deposit slips. This magnetic ink contains iron-oxide which can be charged and read by this device.

**Optical Mark Readers (OMR)**OMR read pencil marks and soft pens .they convert them into computer readable form. They are used to mark multiple choice exams.

**Optical Character Readers (OCR)**OCR reads characters and converts them into machine-readable form. e.g. used to read utility bills such water and electricity consumption bills, handwritten, typed and printed text.

**Image Scanners**Image scanners convert text, drawings, objects and photographs into a digital form that can be stored in a computer.

PRACTICAL EXERCISE

**SPEECH RECOGNITION DEVICES**

**voice recognition devices**These devices convert a person's speech into a digital form then compares the pattern produced by the user with a set of pre-recorded pattern. When a match occurs the command is executed.

**Audio input devices**These devices are useful for inputting data in situations in which people are unable to use their hands or need their hands free for other purposes. For example, blind and paralyzed people can give verbal commands to their computers rather than use the keyboard.

**A System with digital devices**Definition
An input device is any peripheral used to convert data from human readable to computer readable form and enter into a computer.

**DIGITAL DEVICES**

Digital cameras
Digital cameras are devices that capture images and convert them into digital form that can be transmitted directly to a computer hard disk for manipulation, storage and printing.
The Central processing unit (CPU) controls and manipulates data to produce information. In a microcomputer the CPU is usually contained on a single integrated circuit or chip called a microprocessor. The CPU is the brain of the computer.
The CPU consists of the following:

1. Control unit (CU)
2. Arithmetic logic unit (ALU) and
3. Main Memory.

insert well labeled picture showing a motherboard displaying the location of the processor and the memory chip
By the end of the lesson, you are expected to:

1. Describe the control unit
2. Describe arithmetic and logic unit
3. Describe memory
4. Describe processors.

**CENTRAL PROCESSING UNIT (CPU)**The central processing unit inclides control unit, Arithmatic unit, Registers, Main memory and Processors.
A microprocessor

**CONTROL UNIT (CU)**

Control unit is part of the CPU that performs the following functions:

1. Instructs the computer system on how to carry out a programs' instructions
2. Directs the movements of electronic signals between main memory and the Arithmetic and Logic Unit
3. Directs signals between main memory and input/output devices

**ARITHMETIC AND LOGIC UNIT (ALU)**

ALU is a portion of the central processor that performs arithmetic operations and logical operations.
It also controls the speed of those operations. Examples of arithmetic operations are; addition, subtraction, multiplication and division. while logical operations are such as comparisons (greater than, equal to, less than, not equal to).

**REGISTERS**

The Control Unit and ALU contain registers. Registers are high-speed storage locations that temporarily store data during processing and provide working areas for computation. They hold material that is to be processed immediately.

**MAIN MEMORY**

The main memory, which is also called primary storage, internal memory or Random Access Memory (RAM) is the working space in a computer.
The main memory has three functions:

1. It holds data for processing
2. It holds instructions (programs) for processing the data
3. It holds information waiting to be sent to an output device or secondary storage

The main memory is volatile ( i. e the contents are lost when the computer is switched off). The size of the main memory determines the volume of data that can be processed at once and the size of a program that may be used to process data.

**RAM chip**
**Processing Speeds**The speed at which the processor executes instructions is called clock speed. The system clock controls how fast all operations take place. The faster the clock the faster the processing. The processor speeds are measured in megahertz (MHz). 1 MHz equal to 1 million beats (machines cycles) per second.

**Types of Processors**There has been a remarkable growth in processing capability and clock speed of processors. There are three common types of processors, namely;

1. The Intel Family (Intel 8086 and 8088, Intel 80836, Intel 80846, Intel 80286, Intel Pentium, Intel Celeron)
2. The Advanced Micro Devices computer processor (AMD)
3. The Cyrix

**Intel 80836**
**Intel 80286**Output devices convert machine-readable data that has been processed into human readable form. Output devices can be categorized into two groups; softcopy and hardcopy output devices.
Softcopy output devices produce output that is temporary and intangible while hardcopy output devices produce output that is permanent and tangible.

1. describe softcopy output devices
2. describe hardcopy output devices

**Exercise**
**Output Devices**These are the communications points from the computer
They are classified as softy copy and hardcopy devices.

**SOFTCOPY OUTPUT DEVICES**

These devices produce intangible output. They include monitors, speakers, projectors and LED.

**MONITORS**

A computer monitor may also be called a screen or Visual Display Unit (VDU).The monitor on your computer is an output unit converting computer data into human readable form. This makes it one of the communicating link between you and the information in your computer.
Like conventional TV screens, computer monitors are measured diagonally from corner to corner.

**Screen Resolution**

Screen resolution is a measure of the clarity of the computer display and is usually expressed in pixel. A pixel (picture element) is the smallest dot that can be displayed on a monitor.Low resolution gives unclear text and graphics as a result of small number of pixels used to form the picture. High resolution gives greater clarity and sharpness by displaying text and graphics using many pixels.
High resolution display

**Some graphic standards for screen resolutions include:**

1. Video Graphics Adaptor (VGA)640 X 480 pixels
2. Super Video Graphics Adaptor (SVGA)from 800 - 1280 X 600 -1024 pixels

A high resolutions (e.g. SVGA 1280 X 1024 pixels) will result in a smoother appearance for both text and graphics. However, the text and graphics will appear smaller on a monitor with a lower resolution (e.g. VGA 640 X 480 pixels)
Low resolution display

**Types of Monitors**

Monitors are classified into two main types according to display colour (coloured or monochrome) and technology

**Cathode Ray Tubes (CRTs)**

It is a common type of displays similar to standard television set. The inside of the screen is coated with phosphorescent material. An electron beam strikes this surface, exciting the phosphors and causing them to glow. Some disadvantages of CRTs are:

1. They are heavy
2. They consume a lot of power
3. They occupy a large space

**Flat Panels**Flat panel displays consist of two glass plates separated by a substance that may be activated in a particular way. Flat panel displays are classified into two:

1. Liquid crystal display (LCD): - As the name suggests, it uses liquid crystals which change their appearence when an electric current is passed through them.
2. Plasma Display:- Light is created by a plasma discharge from phosphor between two flat panels of glass.

**Advantages of flat panels:**

1. They are comfortable to use
2. They are portable
3. They consume less power as compared to CRTs.

**SOUND OUTPUT**These devices produce digitized sounds ranging from beeps and chirps to music. Output is usually produced through on-board or external speakers.

**VOICE OUTPUT DEVICES**These devices convert digital data into speech like sound. These devices are becoming popular, for example, in mobile phones you have probably heard (The mobile subscriber cannot be reached) or (The number you have called cannot be completed at the moment)

**PROJECTORS**These devices are used to show information appearing on a computer screen onto a vertical screen for easier viewing. It is popular for presentations to large groups of people.Here is an example of an LCD projector