COMPUTER STUDIES NOTES

FORM 1

**HARDCOPY OUTPUT DEVICES**

These devices produce tangible output. They include printers, plotters and microfilm/microfiche.

**PRINTERS**

Printers are output devices that convert computer data into printed characters or graphics on paper. It is one of the most commonly used peripheral devices in general business. Printers can be categorized into two groups: Impact printers and Non-impact printers.
Printers are classified according to either mode of printing or speed of printing.

**1. Mode of printing** - this depends on the printing mechanisms i,e impact or non-impact.

**IMPACT PRINTERS**

Impact printers have a carbon ribbon and characters are (hammered) onto paper through the carbon ribbon, just like with a typewriter. Examples include dot matrix, chain printers, drum printers, golf ball and daisy wheel printers.

**Dot-matrix printer**

These printers have lines of pins programmed to hammer carbon ribbon onto paper to make a dot. This is a noisy and a slow process and produces low quality text and graphic output. With addition of a colour ribbon, colour output can be achieved.

**NON-IMPACT PRINTERS**

Non impact printers form characters and images without direct physical contact between the printing mechanism and the paper. Examples of non impact printers include ink-jet, laser and thermal.

**Ink-jet Printers**

An ink-jet or bubble printer form images with little dots. They spray small electrically charged drop lets of ink from nozzles through holes in a matrix at a high speed onto paper.
They can produce inexpensive colour output, are quiet and less expensive.

**Laser Printers**

Like dot matrix, laser printers create images with dots. These images are created on a drum with magnetically charged ink-like toner (powder) then transferred from drum to paper. They are popular because they produce clear images of both text and graphics, are quiet and very fast however they are expensive.

**Thermal Printers**

It is a character printer that provide character prints using the principle of heat. They use special print papers that senses the heated head character images which are then passed onto the papers as character prints.

**2. Speed of printing**

**This include from the slowest to the fastest.**

1. The character printers - they print one character at a time, e.g. the dot matrix printers.
2. The line printers - they print a line at a time, e.g. Ink jet printers.
3. The page printers - they print a whole page at a time, e.g. laser printers.

**Plotters**This is a specialized output device designed to produce high quality graphics in a variety of colours. They are used for creating large hardcopy items such as maps and architectural drawings.

There are two main types of plotters:

1. **Flatbed**
2. **Drum**

A flatbed has a flat board which supports the paper on which a drawing is made. Drum plotters use a roll of paper which is mounted on a drum that can rotate.

Drum Plotter

Flatbed Plotter

As you have learned in the previous lesson, the data you are working on is stored in RAM (primary memory). Because RAM is volatile, data in it disappears when the power to the computer is turned off. Therefore, if you want to store data and programs permanently (until they are erased) you must save it onto a secondary storage device.

When information is read from a secondary storage, it is copied from the storage device to **RAM**. You have probably heard the phrases loading a program or opening a file to describe retrieving information from a secondary storage. The action of saving a file involves writing to a storage device. The computer mechanism that makes reading and writing possible is called a drive. Drives are designed to work with specific types of storage devices.
Secondary storage devices come in different types and sizes. They are classified according to the media used to make them as follows:

1. Magnetic tapes
2. Magnetic disks
3. Optical disks
4. Flash memory
5. describe magnetic tapes
6. describe magnetic disks
7. describe optical disks
8. describe flash disks

**Secondary Storage devices**

Secondary storage devices include tapes, Disks, Optica Disks and hard disks.

**MAGNETIC TAPES**

Magnetic tapes are thin plastic tapes that have been coated with a magnetic substance for storing data. The tapes were commonly used as secondary storage media for large computer systems. Nowadays they are mainly used to provide backup or duplication storage and in archiving of data.
Magnetic tapes are not very popular because accessing data on tapes is usually slow because data is stored serially i.e one after the other.
There are two different types of magnetic tapes namely:

1. Magnetic tape units (reels) used with large computers
2. Cartridge tape units (tape streamers) used with large computers and microcomputers

**Magnetic Tape Reel**

Catridge Tape Unit
Taking Care of Diskettes
Diskettes are very delicate and therefore must be handled with care.

**MAGNETIC DISKS**

Magnetic disks are secondary storage medium that allow data to be held as magnetized spots on a platter. They are the most commonly used storage devices. They come in two different types; diskettes and hard disks.

**Diskettes**

A diskette or floppy disk is a removable, round, flat piece of plastic that stores data and programs as magnetized spots. They are called floppy because they are made of a material that is flexible.
Diskettes come in different sizes: 3 1/2 inches which is the most common type, micro disks, 8 inches, 51/4 inches which are almost obsolete.
3" floppy diskette

**5 1/4" floppy diskettes**
**8" floppy diskette**

**Characteristics of diskettes**

*Diskettes have the following characteristics:*

**Tracks and sectors**: On diskettes data is recorded on concentric rings called tracks. Each track is divided into invisible wedge-shaped sections called sectors which are used by the computer for storage reference purposes. The number of sectors on the diskette vary according to the number of bits per inch (recording density). Each sector holds 512 bytes of data (1 byte is equivalent to 1 character).

**Write-protect features**: Diskettes have features to prevent someone from accidentally writing over data on the diskette or making changes to program and data files. To write-protect your diskette, you press a lever toward the edge of the diskette, uncovering a hole which appears on the lower right side, when viewed from the back.
Data density: Not all diskettes hold the same amount of data. A diskettes capacity depends on its recording density (the number of bits per inch that can be written onto the surface of the diskette. Today most diskettes are high-density (HD) and can store upto 1.44 MB (Mega Bytes).
**Formatting diskettes**: Formatting means preparing a diskette to make it ready for use by creating tracks and sectors. Formatting also erases the contents of the diskette.

**HARD DISKS**

Hard disks are thin, rigid metal or glass platters covered with a substance that allows data to be held on magnetized spots. They are usually tightly sealed within an enclosed unit to prevent any foreign matter such as dust or smoke particles from getting inside.
Hard disks come in three categories; internal, external and removable hard disks

**Internal hard disks**Internal hard disks are sealed inside a hard disk drive that is built into the system unit and cannot be removed. They are also referred to as fixed hard disks.

**OPTICAL DISKS**

Optical disks are removable disks on which data is written and read through the use of laser beams.

The most familiar form of optical disk is the one used in the music industry. The optical disk technology has revolutionized the music business with compact disks (CDs) and the computer industry with a form of secondary storage.
CDs may hold 650 MB of data or more. A 650 MB CD can hold 250,000 pages of text, or more than 7000 photos or graphics or 19 hours of speech or 74 minutes of video.
Optical disks used with computers include the following;

1. Compact disks Read Only Memory (CD-ROM), Digital Versatile disks - ROMs DVD-ROM).
2. CD-RW (Rewriteable)
3. CD-R (Recordable), DVD-R

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Optical disks used with computers consist of these main types:

1. Compact disks (CDs)
2. Digital Versatile disks (DVDs)

**COMPACT DISKS**

CDs has the following types:

1. CD-ROM disks
2. CD-R disks
3. CD-RW disks

**CD-ROM disk**
CD-ROM stands for Compact disk Read Only Memory. It is an optical disk format used to hold data and software such as prerecorded text, graphics and sound. The contents of CD-ROM are recorded at the time of manufacture and cannot be writ

**Types of CDs**

**1) CD-R DISKS**

CD-R stands for Compact disk recordable. It is a CD format that allows users with CD-R drives to write data only once onto a specially manufactured disk that can then be read by a standard CD-ROM drive. Once the data is recorded, it cannot be written over (changed).

**2) CD-RW disks**

CD-RW stands for Compact disk rewritable. It is a CD format that allows users to erase data so that the disk can be used over and over again.

**DIGITAL VERSATILE DISKS (DVDS)**

DVDs have more storage capacity, faster data transfer rate, deliver high quality pictures and sounds as compared to CDs. DVDs has the following types: DVD-ROM disks, DVD-R disks and DVD-RW disks.

**1) DVD-ROM disks -**This is a DVD format used to hold data and software such as prerecorded text, graphics and sound. The contents of DVD-ROM are recorded at the time of manufacture and cannot be written or erased by the user.

**2) DVD-R disks -** This is a DVD format that allows users with DVD-R drives to write data only once onto a specially manufactured disk that can then be read by a standard DVD-ROM drive. Once the data is recorded, it cannot be written over (changed).

**3) DVD-RW disks -** This is a DVD format that allows users to erase data so that the disk can be used over and over again.