

# Introduction to Computers & IT (Paper-II)

*(BCA Semester I)*

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# Syllabus

- **Introduction to Computers and its Applications:** Computer as a system, basic concepts, functional units and their inter relation, Milestones in Hardware and Software, Batch oriented / on-line / real time applications, Application of computers.
- **Interacting with the Computer:** Input Devices: Keyboard, mouse, pens, touch screens, Bar Code reader, joystick, source data automation, (MICR, OMR, OCR), screen assisted data entry: portable / handheld terminals for data collection, vision input systems. Output Devices: Monitor, Serial line page printers, plotters, voice response units.

# Syllabus

- **Data Storage Devices and Media:** Primary storage (Storage addresses and capacity, type of memory), Secondary storage, Magnetic storage devices and Optical Storage Devices Word Processor using Microsoft Office: Overview, creating, saving, opening, importing, exporting and inserting files, formatting pages, paragraphs and sections, indents and outdents, creating lists and numbering. Headings, styles, fonts and font size Editing, positioning and viewing texts, Finding and replacing text, inserting page breaks, page numbers, book marks, symbols and dates. Using tabs and tables, header, footer and printing
- **Presentation Software using Microsoft Office:** Presentation overview, entering information, Presentation creation, opening and saving presentation, inserting audio and video Spreadsheet using Microsoft Office: Spreadsheet overview, Editing, Formatting, Creating formulas, Graphs.



# Input Devices: Keyboard

## QWERTY Keyboard

### Types of Keys

1. Alphanumeric Keys
2. Function Keys
3. Control Keys
4. Navigation Keys
5. Indicator Keys
6. Numeric Keypad



# Alphanumeric Keys

- Tab
- Caps Lock
- Backspace
- Enter
- Spacebar
- Shift



# Function keys

- F1
- F2
- F3
- F4
- .
- .
- .
- .
- F12



# Control Keys

- Alt
- Ctrl
- Esc
- Delete
- Pause
- Print Scrn





# Navigation Keys

- Page up
- Page down
- Home
- End



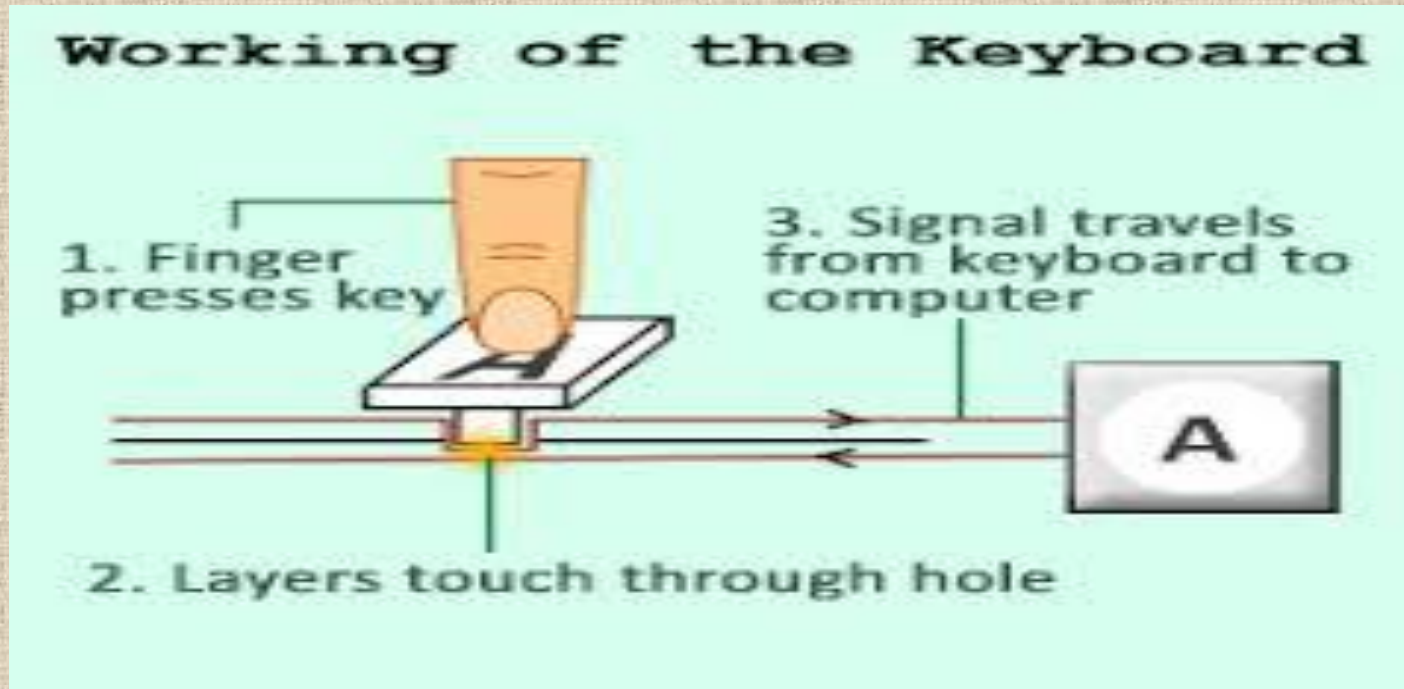


# Numeric Keypad

- Ten digits (0,1,2,3,4,5,6,7,8,9)
- Mathematical Operators ( + , - , \* , / )



# Working of Keyboard



Keyboard Controller → Keyboard Buffer → System Software → CPU

# Input Devices: Mouse

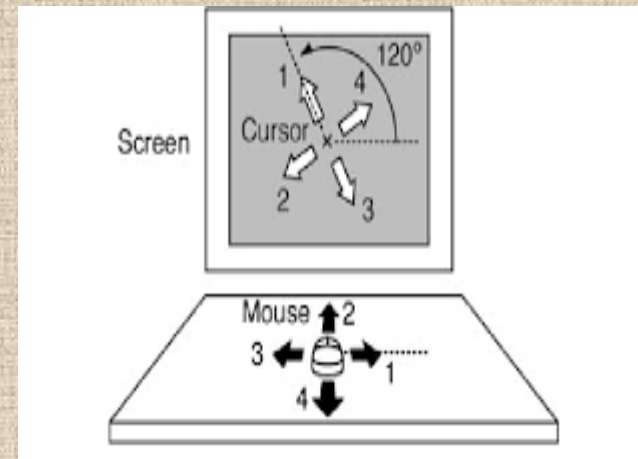
- A mouse is an input device that allows you to select an object, access menus, manipulate graphics and text on the screen and interact with the programs.



Two Button Mouse



Scrolling Mouse



Mouse/Cursor Relation

# Types of Mouse

- **Optical Mouse**

Uses red Light Emitting diode (LED) instead of Ball

- **Wireless Mouse**

Uses Radio Frequency (RF) to communicate with computer

- **BioMetric Mouse**

Integrated fingerprint reader that permits only authorised users to access.



# Mouse Actions

**Clicking:** Quickly press and release primary button (left)

**Double Clicking:** Two quick taps to mouse

**Right Clicking:** Quickly press and release left button

**Dragging:** Pressing and holding down the mouse while simultaneously moving it.

**Scrolling:** Moving the scroll button to scroll window

# Touch Pad

Small, Flat, Rectangular stationary pointing device that one uses with his/her finger to move pointer on screen.

Laptops have builtin touchpads.

Touchpad sensitive to pressure and motion.

Generally touchpads have 2-3 buttons that work like mouse buttons



# Touch Screen

- Accepts Input by allowing user to select objects or menus with the touch of a finger
- Uses sensors on screen's surface to detect touch.
- May also use optical, electrical or acoustical methods to sense input
- Used in Banks' ATM, POS, Information Kiosks in hotels, airports etc.





# Light Pen

- Hold digital Pen and write on flat surface to write, draw or make selections on a monitor/mobile device.
- Consists of photocell placed in small tube.





# Game Controllers

Game Pad



Joystick



Wheels & Pedals



Light Gun



# Scanner

Optical Scanner is a light sensing input device that reads text/graphics by shining light on document and then senses intensity of light's reflection.

Scanner uses CDD (Charge Coupled device) technology.

New Scanners use CIS (Contact Image Sensor) technology.

# Types of Scanner

## **Flat Bed Scanner**

Rectangular Plastic Box with glass plate on its top and lid that covers glass plate.

Light emitted from under the glass reflects off the object to be scanned.





# Types of Scanner...

## **Hand Held Scanner**

Small portable scanner that depends upon human operator to move the head across the object to be scanned.

LED (Light Emitting Diode) is used for scanning

Amount of reflected light determines the data.





# Barcode Readers

A barcode is an identification code consisting of several lines and spaces of different widths.

Reflected light patterns convert into electrical pulses and transmitted to computer.



Barcode

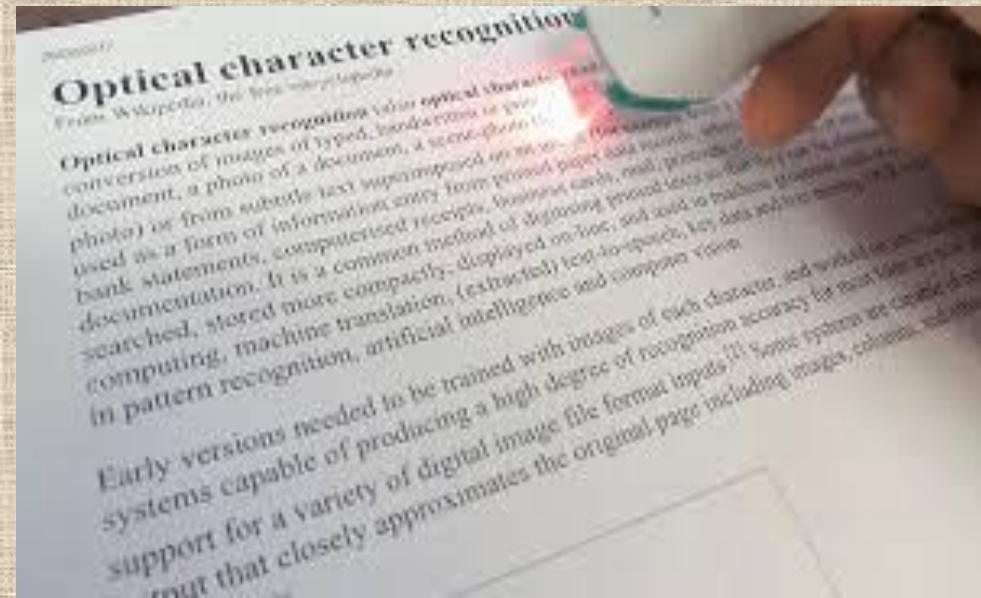
## Barcode Reader



QR code

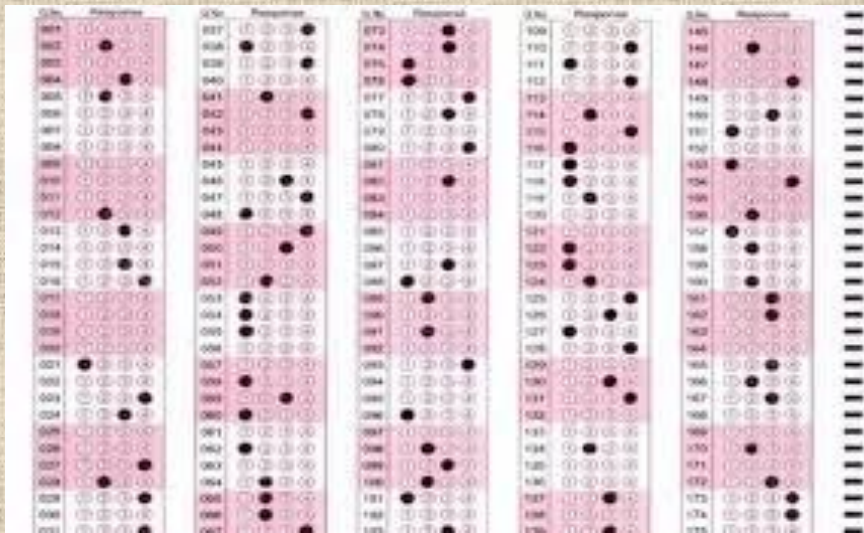
# OCRs

- Optical Character Recognition is used to convert hand written, computer printed or type written characters to soft copy.
- Converts bitmap images of scanned characters into array of grid points and then to ASCII code.



# OMRs

- Optical Scanner that reads presence or absence of marks by passing laser beam on the surface of the document such as answer sheet.
- On the basis of light reflected, software detects the correctness of answer.
- Used in objective type paper, questionnaire etc.





# MICR

Magnetic Ink Character Recognition involves reading text from documents printed with magnetized ink.

Cheques, Drafts are printed with magnetized ink.

MICR is an optical scanner that reads characters printed with magnetized ink from documents by examining their shapes using 7\*10 matrix.

E-13B and CMC-7 are commonly used MICR



# MICR ..

THE FACE OF THIS CHECK IS PRINTED RIGHT. THE BACK CONTAINS A SIMULATED WATERMARK

**RELYCO** 123 Gateway - Dover, NH 03820  
P 603 237 2300 | www.relyco.com

11/17/08  
NO. 54

CHECK NO. 001001

DATE	PAY AMOUNT
03-21-2009	

PAY \*\*\*Two Hundred Fifty Eight Thousand Five Hundred Seventy Seven and 58/100 \$ 258,577.58

TO THE ORDER OF COMPANY ABC  
PO BOX 1234  
DOVER, NH 03820

MICR Line Jane Doe

⑆00000⑆ ⑆00000⑆ ⑆00000⑆

⑆00000⑆ ⑆00000⑆ ⑆00000⑆

Check Number Routing Number Account Number



# Factor affecting Scanners

- ✓ Resolution
- ✓ Dynamic Range or Optical Density
- ✓ Speed
- ✓ Bit Depth
- ✓ Software

# Voice Input System : Microphone

Used to record speech, making phone calls and doing audio conferencing.

Sound card translates analog signal received from microphone into digital codes that computer can store and understand.



# Digital Camera

- Mobile Device used to capture photographed images digitally.
- The image is focused on a chip called a charged coupled device (CCB)
- Analog converter converts the analog signal to digital and store compressed image on memory card





# Output Devices

Hardwired Component that takes machine coded output results from a computer and translates them in a form suitable for the outside world

- Monitors
- Data Projectors
- Printers

# Monitors

Its an standard output device that visually displays output in the form of some text, graphics and video information.

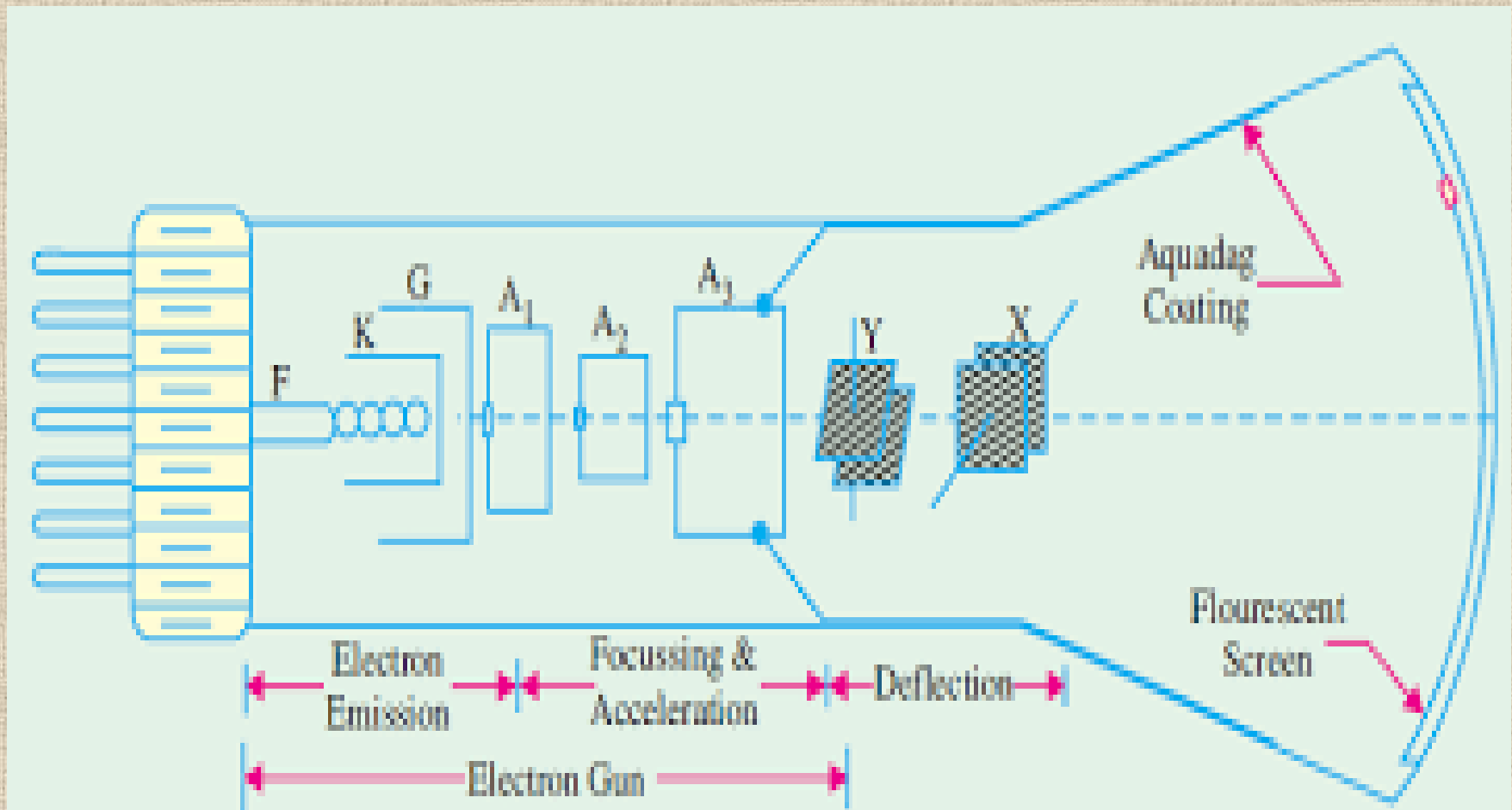
It is also known as VDU (Visual Display Unit).

Usually plugged into DVI (Digital Video Interface) port, HDMI (High Definition Media Interface) port or Display port.

Contains video dedicated memory and circuitry that helps in displaying information.

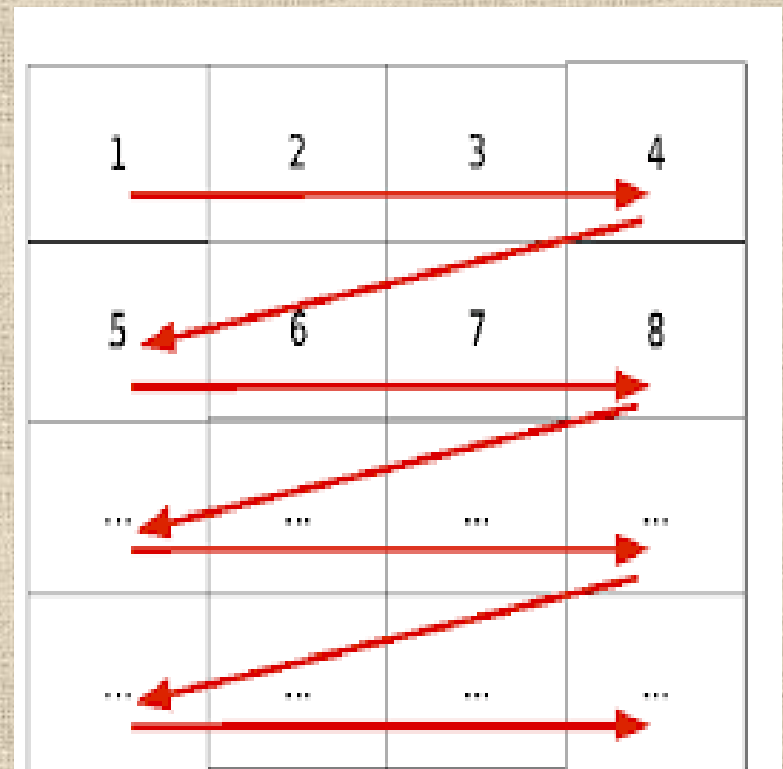
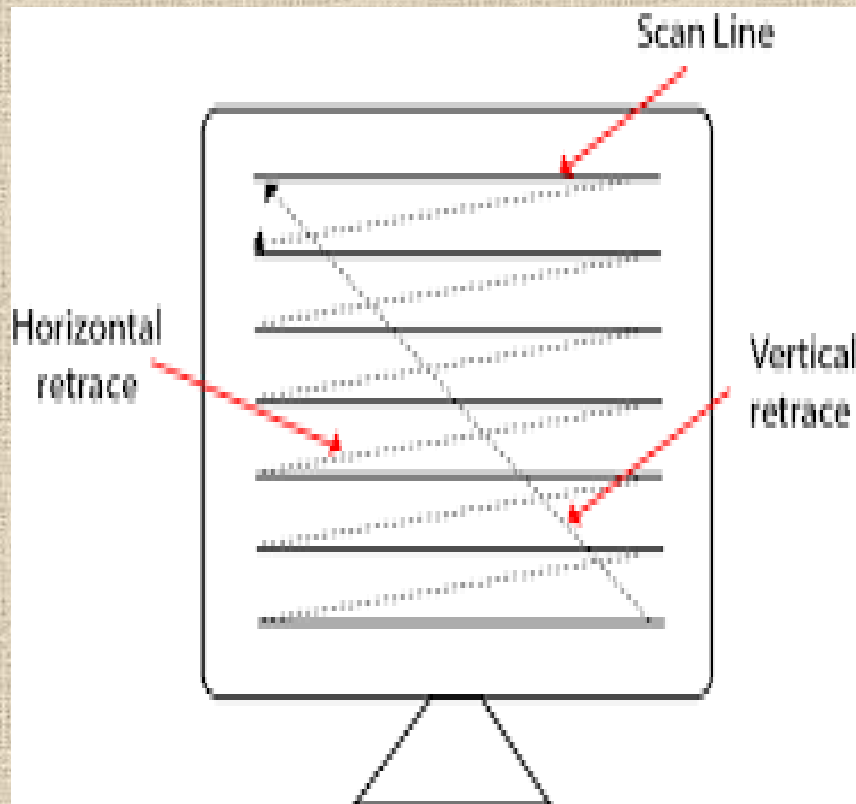
# CRT Monitor

Desktop Monitor that contains a Cathode Ray Tube.



# Raster Scan and Random Scan

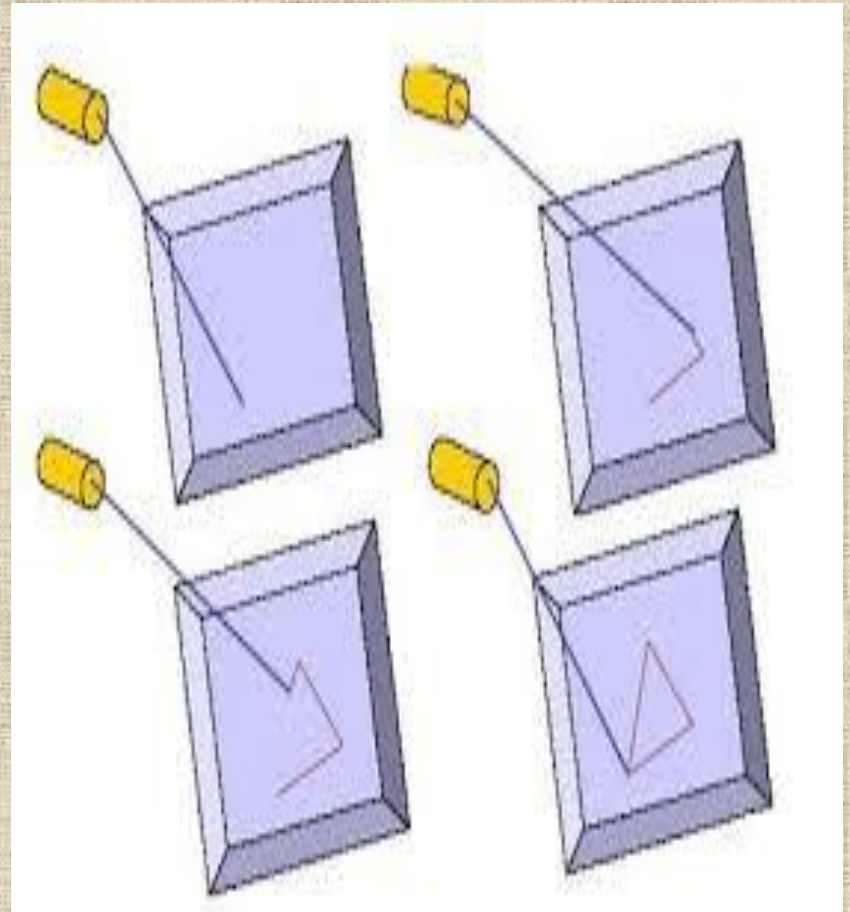
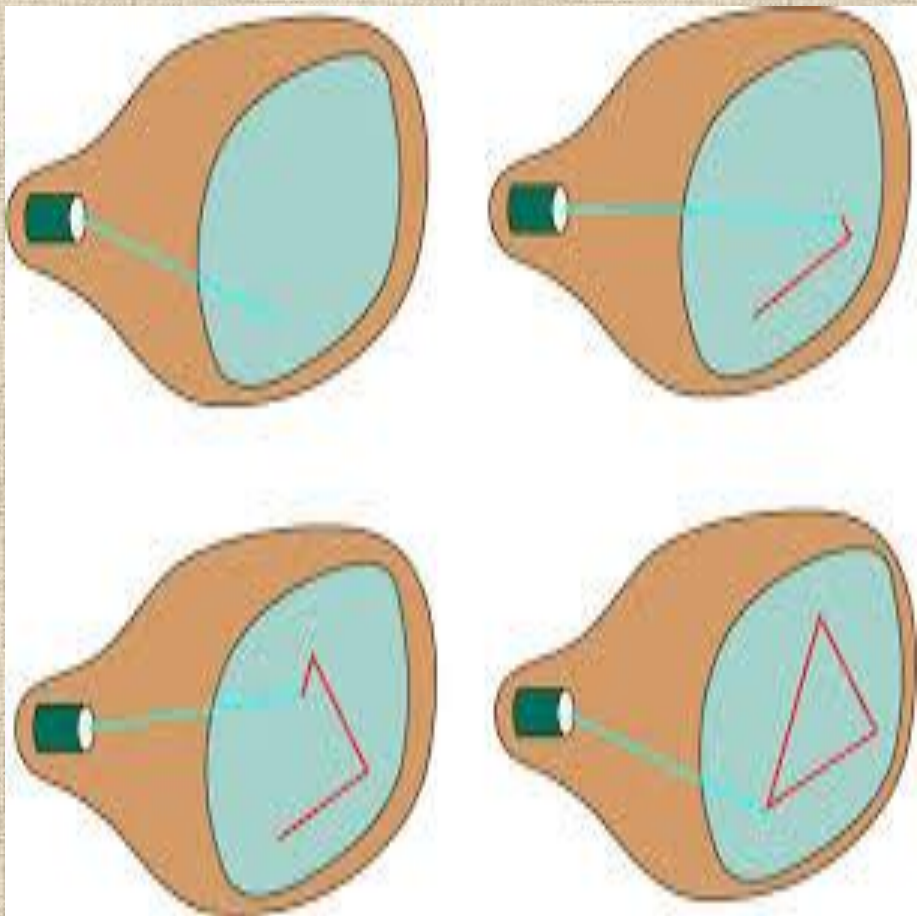
In Raster Scan system, electron beam is swept across the screen with one row at a time from left to right and top to bottom.





# Raster Scan and Random Scan

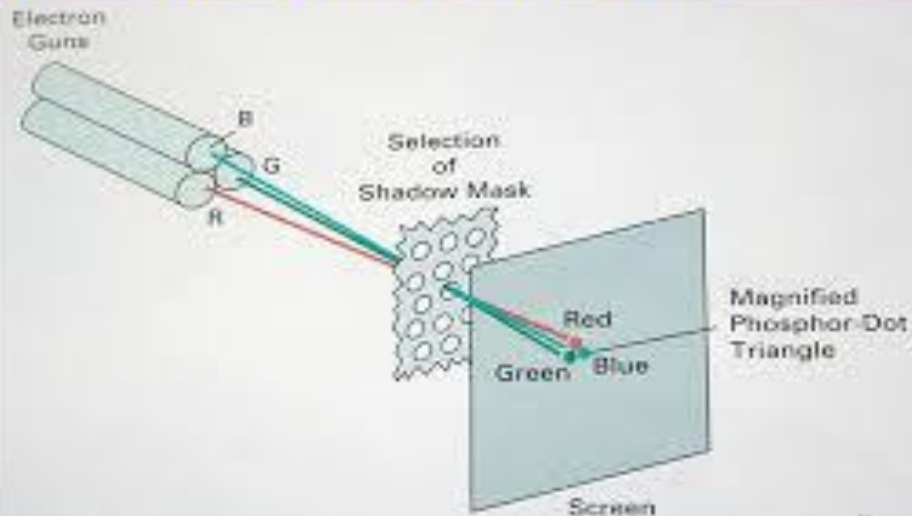
In Random Scan system, electron beam is directed to only those parts of the screen where picture is to be drawn.



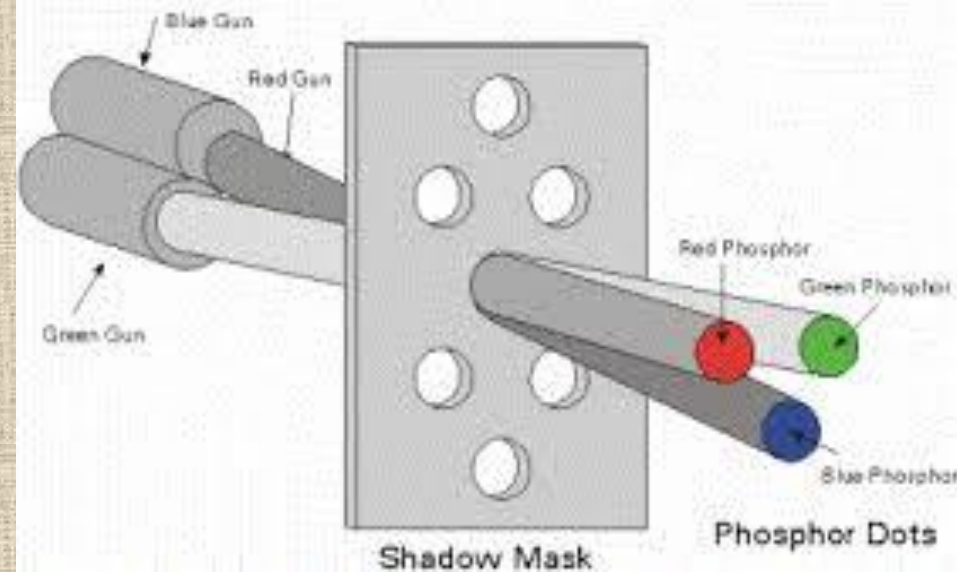
# Colour CRT Monitor

- Uses three electron beams, one for each color (Red, Green, Blue)
- Each pixel includes three phosphorous (Red, Green, Blue) arranged in triangle.
- Shadow Mask is used to absorb electrons that may hit wrong phosphorous

## Color CRT Monitor (3)



## Shadow Mask CRT



# Video Adapter

It is an expansion Board that plugs into PC to give it display capabilities.

- CGA (Colors Graphics Apapter)
- EGA (Extende Graphics Apapter)
- VGA (Video Graphics Apapter)
- SVGA (Super VGA Graphics Apapter)
- XGA (Extended Graphics Apapter)



# Flat Monitors

## 1. Emissive Display Device

- Plasma Panels
- Thin Film Electroluminescent display
- Light Emitting Diode

## 2. Non-Emissive Display Device

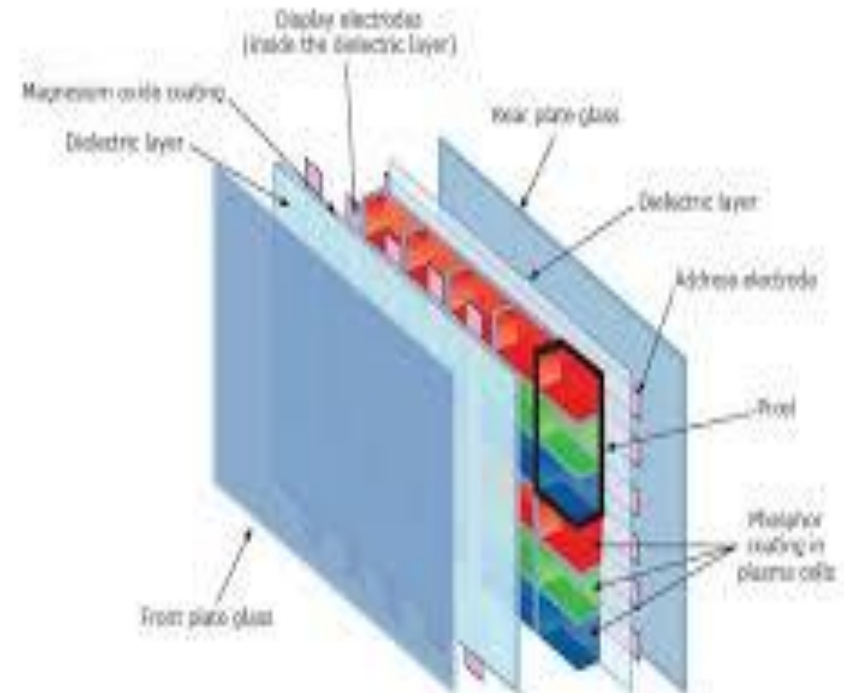
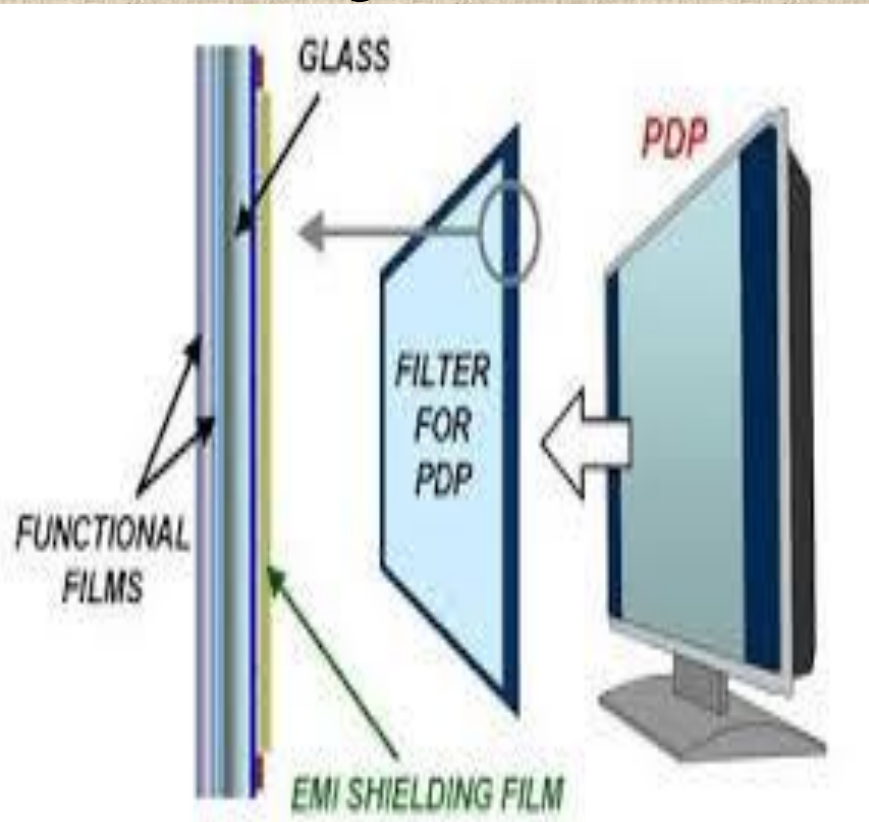
- Liquid Crystal Display Device



# Plasma Panel/Gas Charge Display

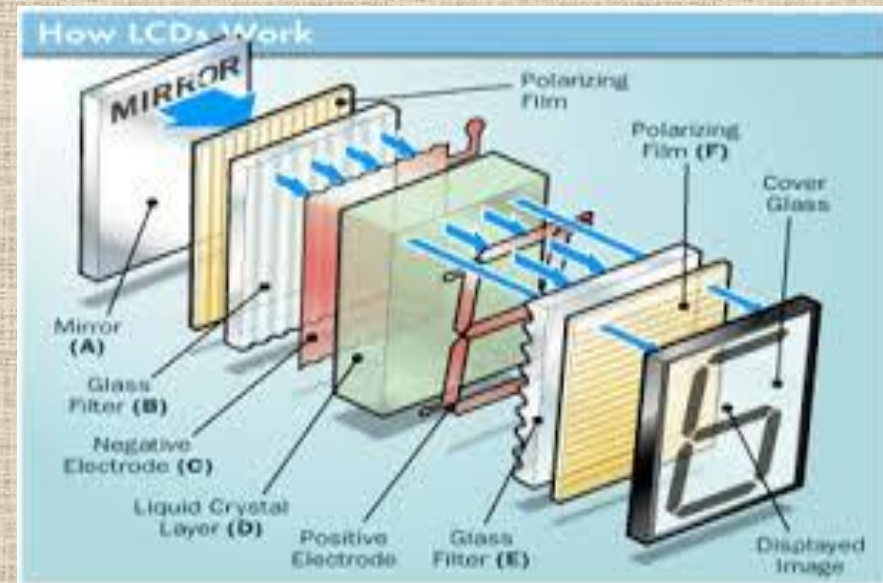
These devices consists of two glass plates having mixture of gases between them.

Conducting ribbons on horizontal/vertical sides.



# LCDs

- Non emissive device that produces picture by passing polarized light.
- Two pieces of polarized glass plates, each containing a light polarizes at right angles to other plate.



# Characteristic Features of Liquid Crystal Display

- Liquid crystal has the property intermediate to liquids and solids with a finite range of temperature.
- Require low voltage and current
- Light sensing capability to increase intensity of display.
- Transparent conductor patterns are coated inside glass panels with a special chemical film to align liquid crystal molecules.



# Disadvantages of Flat Panel Monitors

- Viewing angle is small as compared to CRT
- Liquid crystal used doesn't emit lights, so no contrast between images and background.
- Limited temperature range
- Poor visibility under low ambient lighting.



# Parameters to compare Monitors

- Screen Size
- Persistence
- Resolution
- Refresh Rate
- Aspect Ratio
- Dot pitch
- Brightness

# Data Projectors

- Takes images, video or computer data and projects it on larger screen/wall
- Generally projectors use LCD technology to create images.
- Newer models use DLP (Digital Light Processing) technology



# Printers

1. Character Printer
2. Line Printer
3. Page Printer

On the basis of method of producing output

1. Impact Printer
2. Non Impact Printer

# Parameters to compare Printers

- Speed
- Image Quality
- Cost of Operation
- Initial Cost



# Dot Matrix Printer

- Serial Impact Printer
- Special Print Head for printing
- Buffer equal to size of paper (columns) is used
- 30 to 600 cps speed
- Pin combination is  $5 * 7$ ,  $7 * 9$  and  $9 * 9$



# Daisy Wheel Printer

Print head is like a wheel and printing arms have characters embossed at the corner of these arms.

Serial Impact Printer

Slow speed – 30 to 80 characters per second

Cannot print graphics image.

Less noisy than Dot Matrix Printer

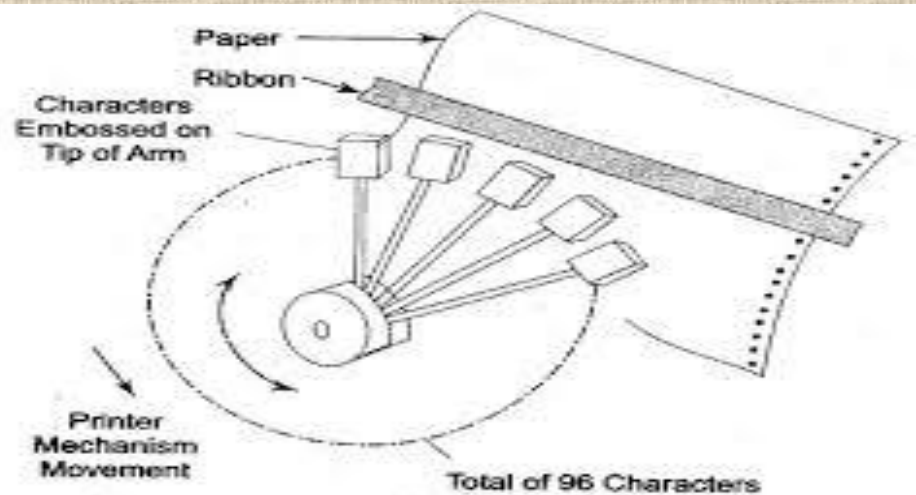


Fig. 2.26 (b) Daisy Wheel Printer

# Inkjet Printer

Non impact printer with high speed and quality.

Catridge with several small ink holes or nozzles.

Both text and graphics in both black and color on different paper types.

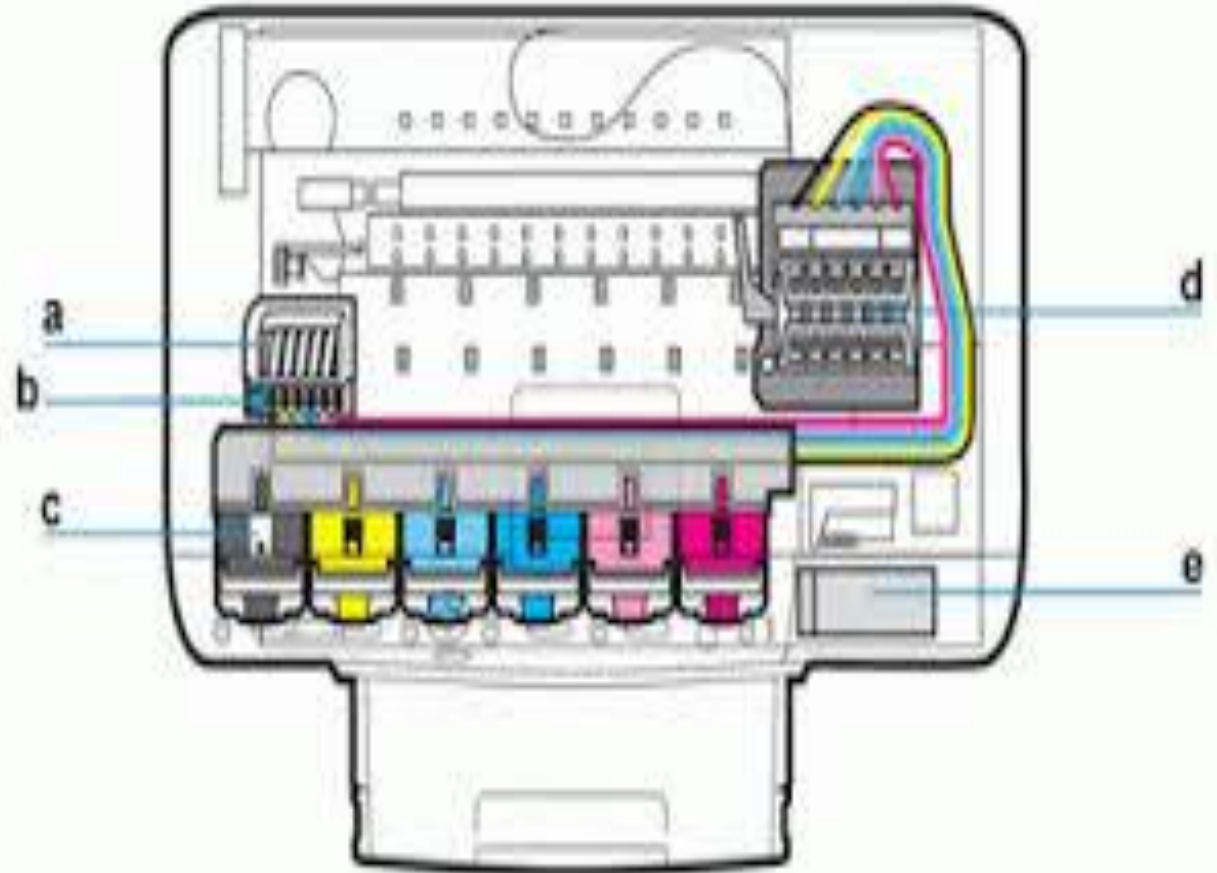
Formation of character is effected by making charged inked droplets to deflect using horizontal/vertical deflection plates.

Quality is measured in dots per inch which is atleast 360

Speed is 12 to 36 ppm (pages per minute)



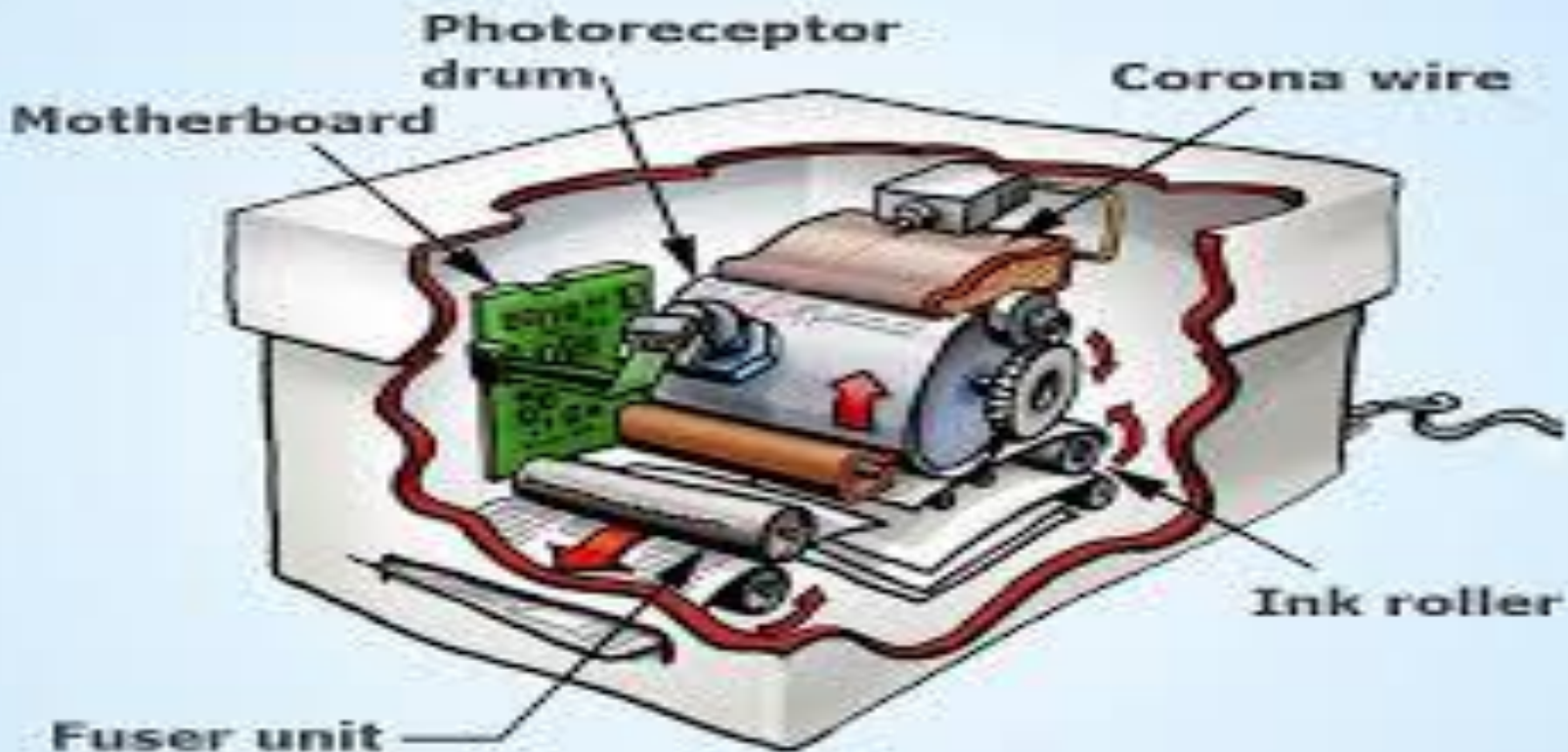
# Inkjet Printer ..





# Laser Printer

- High quality, high speed non impact page printer
- 600 dpi to 2400 dpi resolution
- 4 to 36 pages per minute (ppm)



Thanks