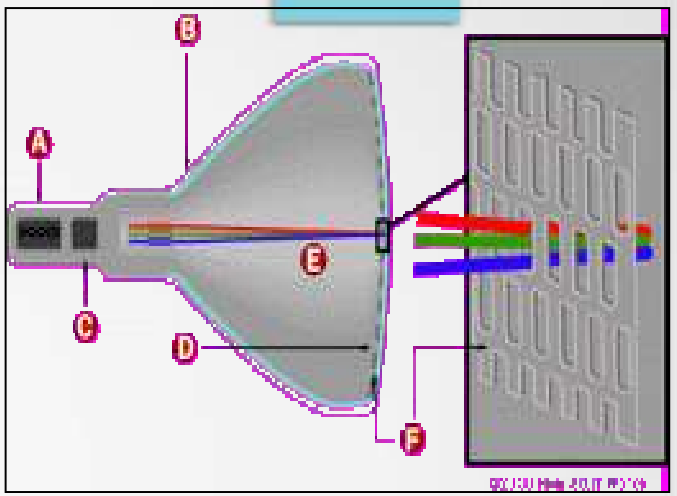
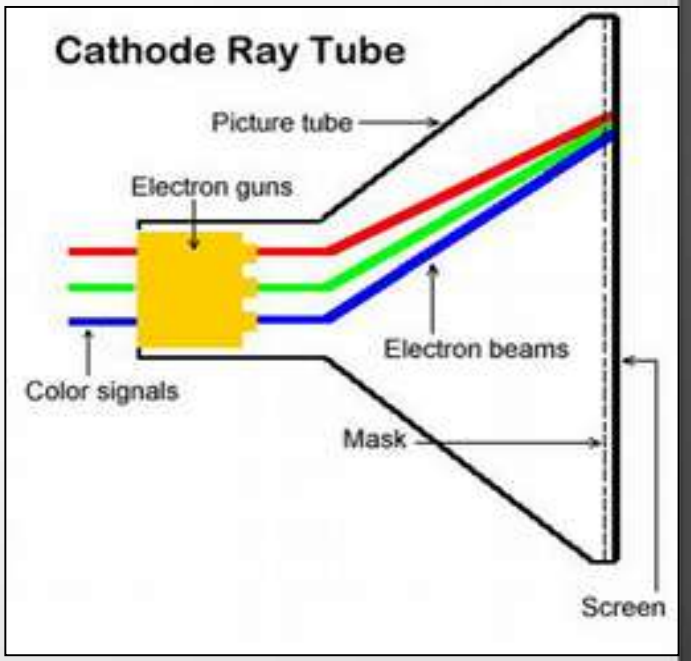
GLS UNIVERSITY

COMPUTER FUNDAMENTALS & INFORMATION TECHNOLOGY.
UNIT– II

Output Devices

- An output device is any peripheral that receives data from a computer, usually for display, projection, or physical reproduction.
- **CRT Display Units:** A cathode ray tube (CRT) is a specialized vacuumtube in which images are produced when an electron beam strikes surface. Most desktop computer displays make use of CRTs. The CRT in a computer display is similar to the "picture tube" in a television receiver.
- A CRT monitor contains millions of tiny red, green, and blue phosphor dots that glow when struck by an electron beam that travels across the screen to create a visible image. In a CRT monitor tube, the cathode is a heated filament. The heated filament is in a vacuum created inside a glass tube. The electrons are negative and the screen gives a positive charge so the screen glows.





Output Devices: Non CRT Display Units

- **LCD:** LCD (liquid crystal display) is the technology used for displays in notebook and other smaller computers. LCDs allow displays to be much thinner than cathode ray tube (CRT) technology.
- An LCD is a passive device, which means that it does not deliver any light to display characters, animations, videos, etc. LCD uses fluorescent tubes to lighten the picture, but can't provide the clearer picture as LED delivers. It delivers good color accuracy

Advantage:

- It consumes less power.
- It includes millions of color.
- It is lighter than LED.

Disadvantage:

- It needs extra light sources.
- It have also restricted viewing angle.
- Its speed is very slow.

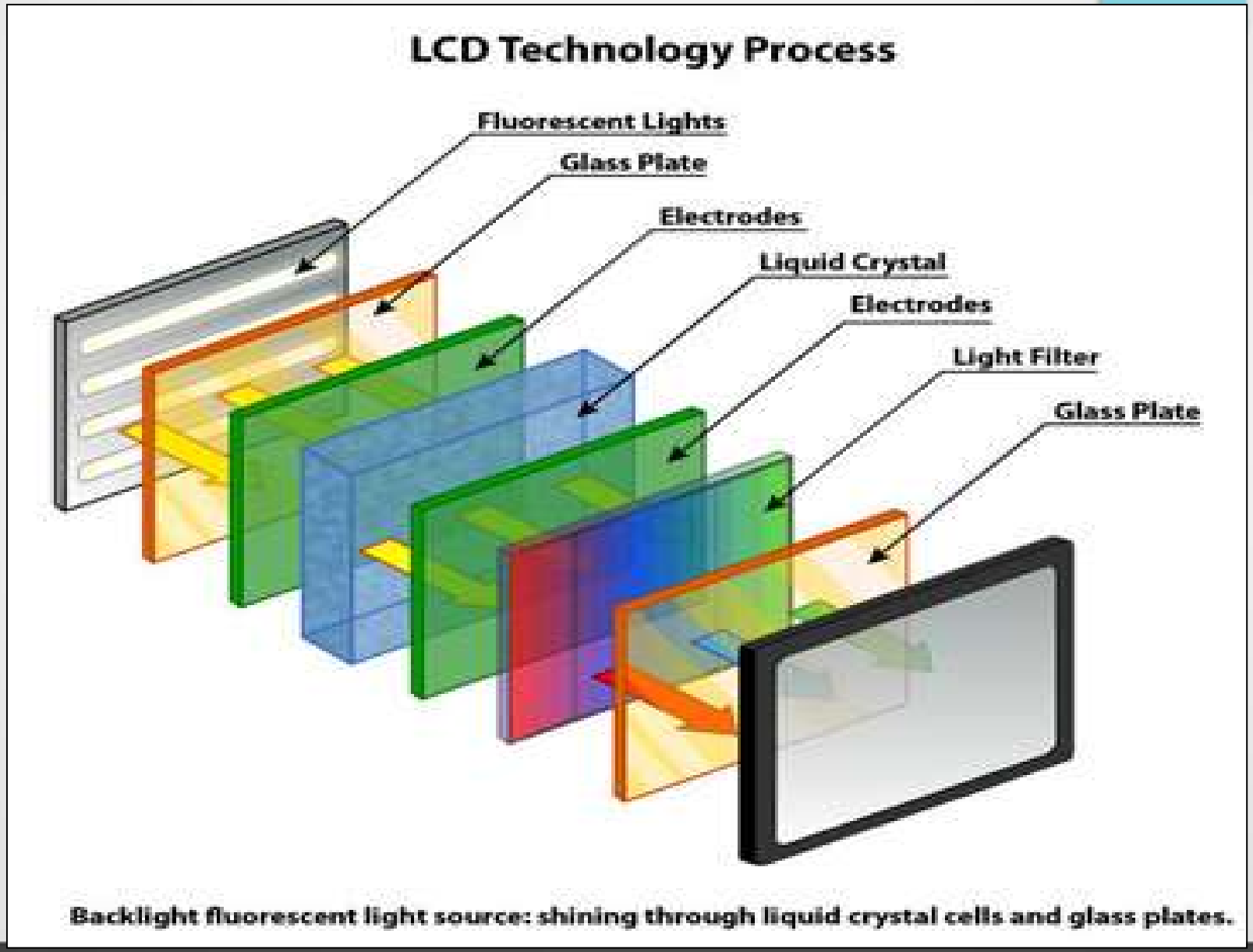
- LCDs are made with either a passive matrix or an active matrix display grid.
- The active matrix LCD is also known as a thin film transistor (TFT) display.
- The passive matrix LCD has a grid of conductors with pixels located at each intersection in the grid.

Types of LCDs

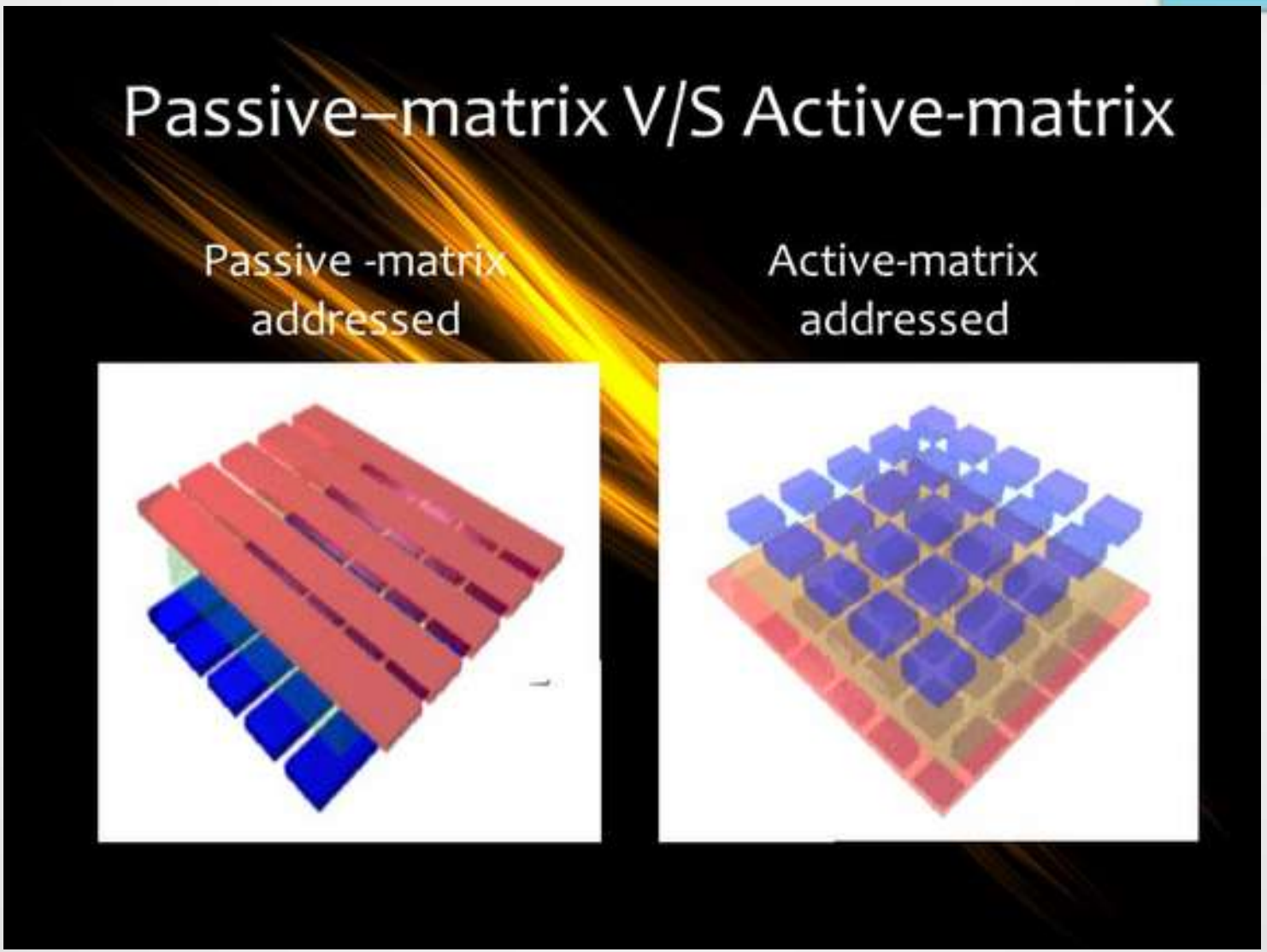
Types of LCDs include:

- **Twisted Nematic (TN)-** which are inexpensive while having high response times. However, TN displays have low contrast ratios, viewing angles and color contrasts.
- In **Panel Switching displays (IPS Panels)-** which boast much better contrast ratios, viewing angles and color contrast when compared to TN LCDs.
- **Vertical Alignment Panels (VA Panels)-** which are seen as a medium quality between TN and IPS displays.
- **Advanced Fringe Field Switching (AFFS)-** which is a top performer compared IPS displays in color reproduction range.

Output Devices: Non CRT Display Units



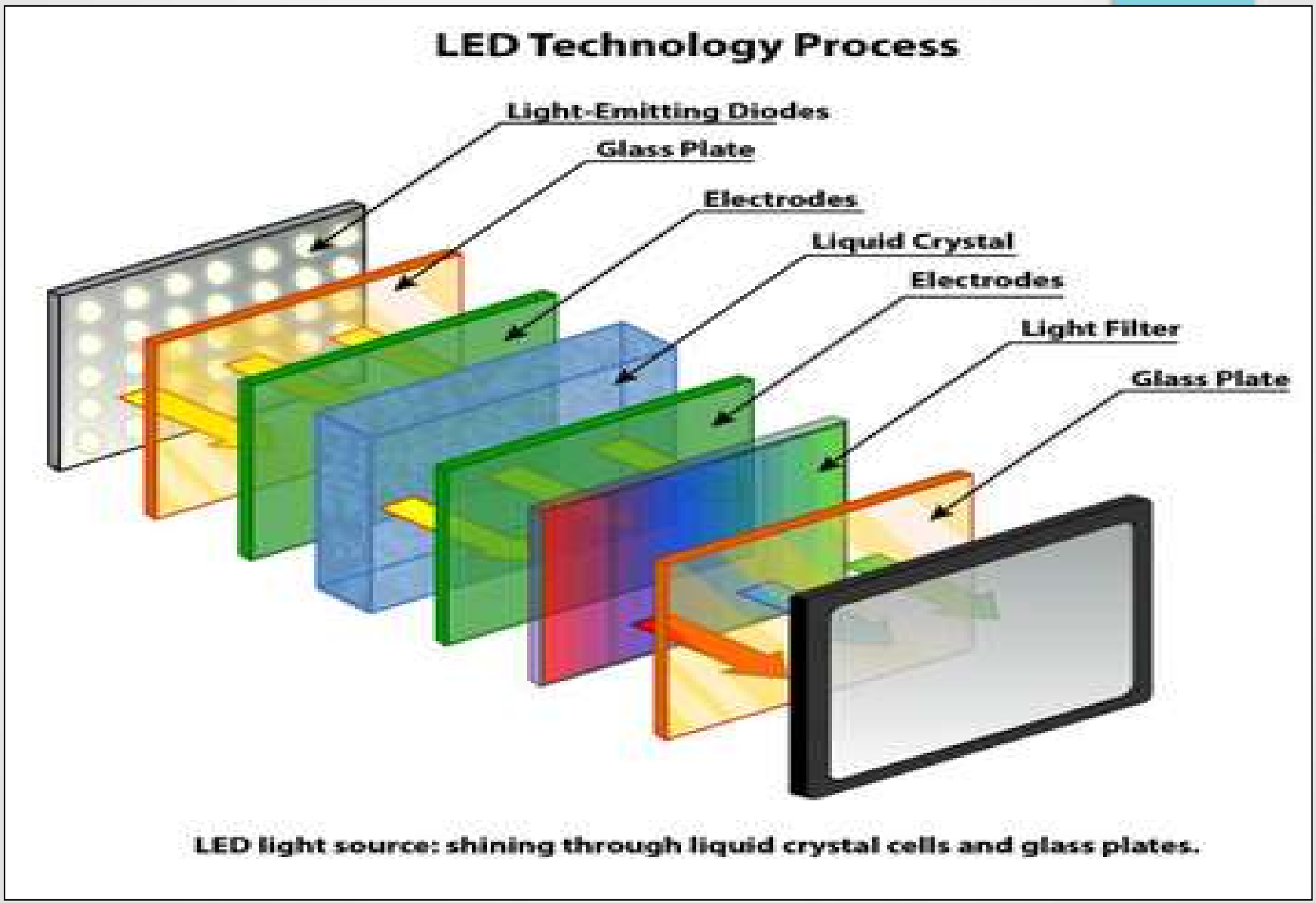
Output Devices: Non CRT Display Units



Output Devices: Non CRT Display Units

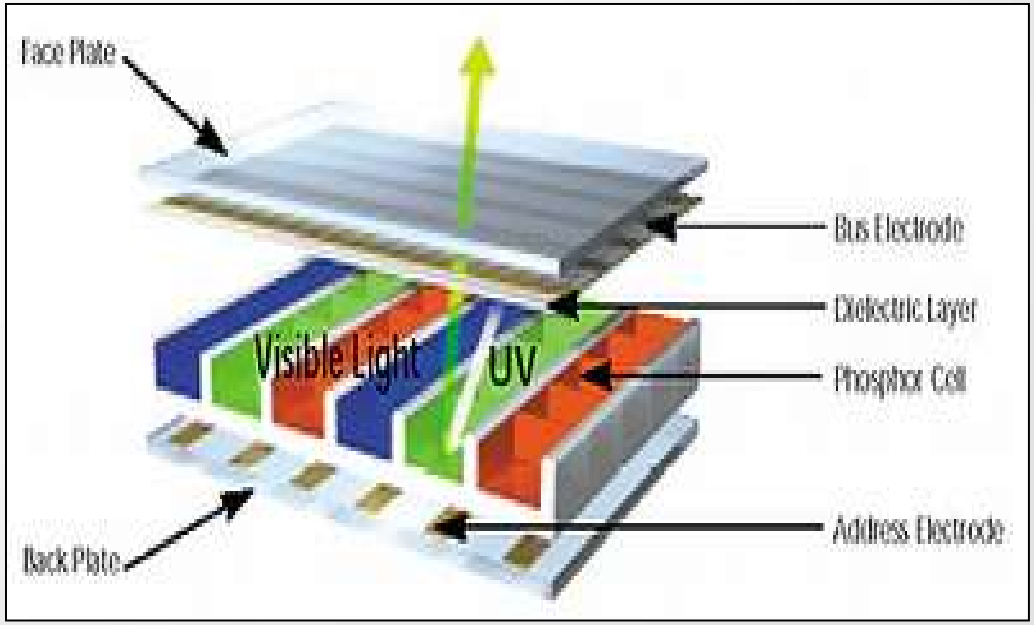
- **LED**: Light-emitting diode (LED) is a semiconductor device that emits light when an electric current is passed through it.
- Visible LEDs are used in many electronic devices as indicator lamps, in automobiles as rear-window and brake lights, and on billboards and signs as alphanumeric displays or even full-colour posters.
- Infrared LEDs are employed in autofocus cameras and television remote controls and also as light sources in fibre-optic telecommunication systems.
- LED allows the flow of current in its forward direction while it blocks the flow in the reverse direction.
- LED have wider viewing angle than the LCD. It have better black level and contrast in comparison to LCD LCD display. LED delivers better color accuracy in comparison to the LCD.

Output Devices: Non CRT Display Units



Output Devices: Non CRT Display Units

- **Plasma Display:** A plasma display is a computer video display in which each pixel on the screen is illuminated by a tiny bit of plasma or charged gas.
- A plasma display is a device that uses gas plasma technology, which sandwiches a layer of gas between two glass plates.
- When voltage is applied, the gas releases UV(ultraviolet) light. This UV light causes the pixels on the screen to glow and form an image.
- Plasma offers larger screen sizes and richer colors than LCD but more expensive.



Output Devices: Non CRT Display Units

- **LCD Projector:** An LCD projector is a type of video projector for displaying video, images or computer data on a screen or other flat surface.
- The way an LCD projector works is that it allows light to pass through three colored liquid crystal display light panels. These panels block certain colors and allow others through so that the image shows up on screen.
- LCD contains three separate glass panels - one for red, green and blue components of the image that is transferred to the projector. As the light passes through the panels, individual pixels can be opened to allow lightweight to pass or closed down to block the light. This action modulates your light and produces the image that is projected onto the display. Thus is it termed 3LCD.

4K Display

- 4K Ultra HD is the name assigned to a screen with a resolution that’s four times that of a Full (1080p) HD TV.
- 4K resolution refers to a horizontal display resolution of approximately 4,000 pixels.
- Digital television and digital cinematography commonly use several different 4K resolutions.
- In television and consumer media, 3840 × 2160 (4K UHD) is the dominant 4K standard, whereas the movie projection industry uses 4096 × 2160 (DCI 4K).
- The term "4K" is generic and refers to any resolution with a horizontal pixel count of approximately 4,000.
- 4K TVs have four times more pixels than traditional Full HD (1920 x 1080) TVs.

Speaker

- **Speaker:** Speakers are one of the most common output devices used with computer systems.
- The purpose of speakers is to produce audio output that can be heard by the listener.
- Speakers is a device that convert electromagnetic waves into sound waves. The speakers receive audio input from a device such as a computer or an audio receiver.
- Speakers typically come in pairs, which allows them to produce stereo sound. This means the left and right speakers transmit audio on two completely separate channels. By using two speakers, music sounds much more natural since our ears are used to hearing sounds from the left and right at the same time. Surround systems may include four to seven speakers (plus a subwoofer), which creates an even more realistic experience.

- **Headphones** are a hardware device that can be plugged into a computer, laptop, smartphone, mp3 player or other device to privately listen to audio without disturbing anyone in the vicinity.
- They are plug-and-play devices and do not require any sort of installation before use.
- Headphones are a pair of small speakers used for listening to sound from a computer, music player or other such electronic device.
- The first pair of audio headphones were invented by Nathaniel Baldwin in 1910.

Printers

- **Printers:** A printer is an external hardware output device responsible for taking electronic data stored on a computer and generating a hard copy of that data i.e. used to print information on paper.
  - **Impact Printers**
    - **Dot-Matrix Printer**
    - **Line Printer**
  - **Non-Impact Printers**
    - **Ink Jet Printer**
    - **Laser Printer**
    - **Plotters**
    - **Label and Postage Printer**
    - **Braille Embosser**
    - **3D Printer**

Printers

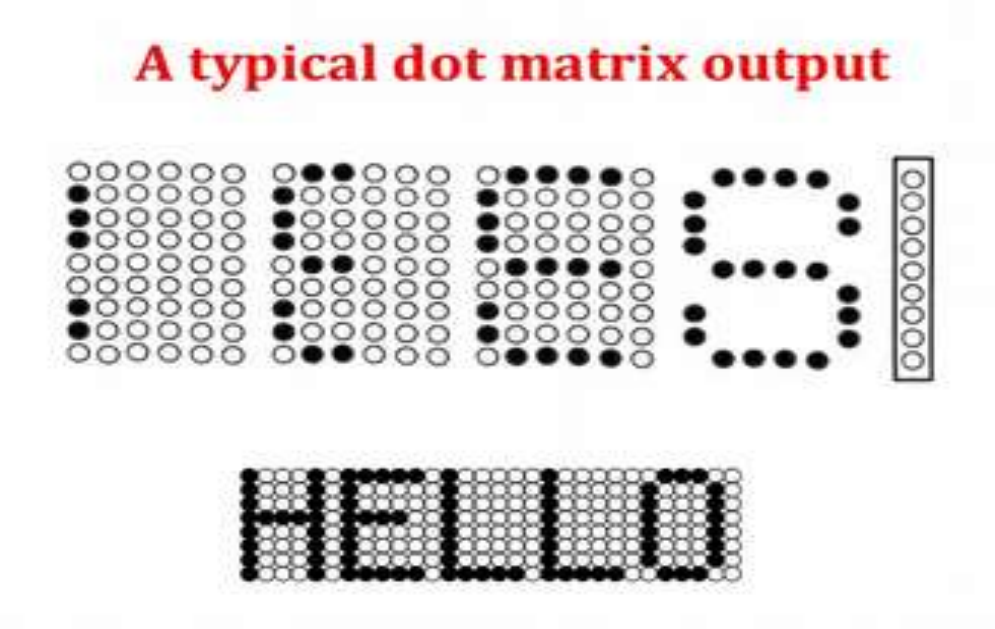
Impact VS Non-Impact

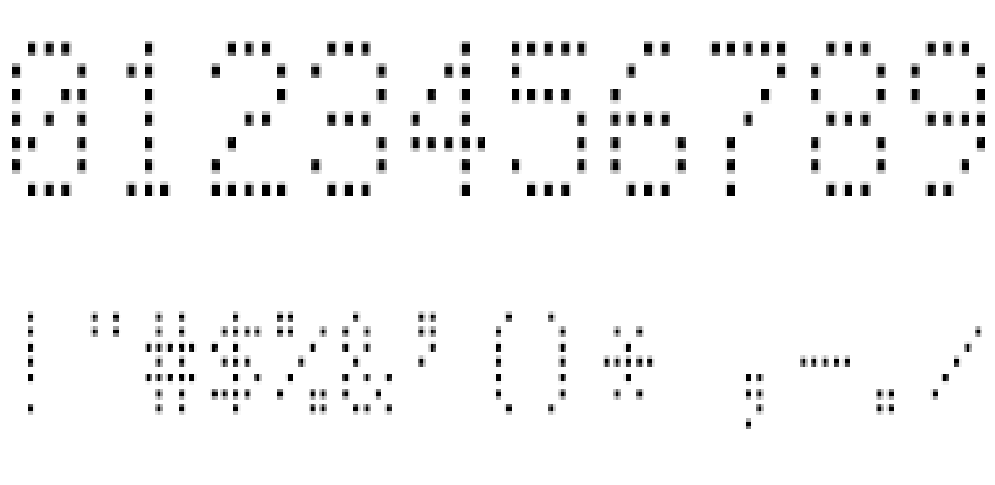
1. Impact printers functions by applying force, where non impact printers does not do so.
2. Non-Impact printers prints without touching the paper, where impact printers does not do so.
3. Non-Impact printers are faster and produce high quality output than impact printers.
4. Non-Impact produce almost no noise during printing where impact printers produce loud noise while printing.
5. Non-Impact printers print more pages per minutes

Impact Printers

- **Dot Matrix Printer:** The dot-matrix printer uses print heads containing from 9 to 24 pins. These pins produce patterns of dots on the paper to form the individual characters.
- The pins strike the ribbon individually as the print mechanism moves across the entire print line in both directions.
- Dot-matrix printers are inexpensive and typically print at speeds of 100-600 characters per second.
- These printers are popular because of their ease of printing and economical price.
- **Advantages:** Inexpensive, Widely Used, Other language characters can be printed
- **Disadvantages**: Slow Speed, Poor Quality

Impact Printers





Impact Printers

- **Line printers:** In business where enormous amount of material are printed, the character-at-a-time printers are too slow; therefore, these users need line printers.
- Line printers, use special mechanism that can print a whole line at once; they can typically print the range of 1,200 to 6,000 lines per minute.
- A fast line printer can print as many as 3,000 lines per minute. The disadvantages of line printers are that they cannot print graphics, the print quality is low, and they are very noisy.
- High speed is one of the advantages of line printers. Compared to other printers, they are low in cost and more durable.

Non-Impact Printers

- **Ink Jet Printer:** Inkjet printers print characters by spraying small drops of ink onto paper. Inkjet printers produce high-quality text and graphics.
- They make less noise because no hammering is done.
- Colour printing is also possible.
- Print the range of 250 characters per second.
- These printers are a better choice if user uses one color more than other colors.
- **Advantages:** High quality printing, More reliable.
- **Disadvantages**: Expensive as cost per page is high, Slow as compared to laser printer.

Non-Impact Printers

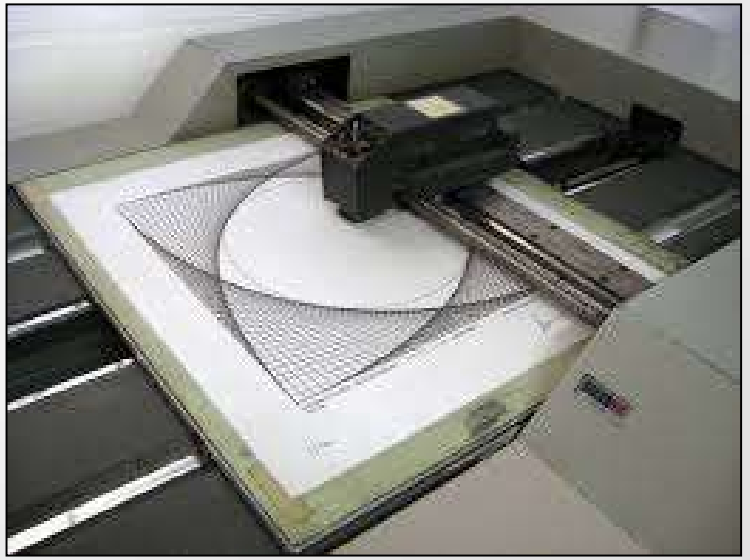
- **Laser Printer:** A laser printer works like a photocopy machine.
- Laser printers produce images on paper by directing a laser beam at a mirror which bounces the beam onto a drum.
- They use laser lights to produce the dots needed to form the characters to be printed on a page.
- It uses buffers that store an entire page at a time. When a whole page is loaded, it will be printed. The speed is high and it does not produces much noise.
- It print approximately 21,000 lines per minute.

- **Advantages:** High quality output, high speed, good graphics quality, Support many fonts and different character size.
- **Disadvantages:** Expensive, Cannot be used to produce multiple copies of a document in a single printing.

Non-Impact Printers

- **Plotters:** Plotter is a well known output device which produce high quality graphics in multiple colour. Plotter is used to create maps,charts etc. on a paper sheet.
- plotters use a pen, pencil, marker, or another writing tool to draw multiple, continuous lines onto paper rather than a series of dots like a traditional printer.
- Plotter is most frequently used for CAE (computer-aided engineering) applications, such as CAD (computer-aided design).

- **Advantages:** work on very large sheets of paper, They can print on a wide variety of flat materials including plywood, aluminum, sheet steel, cardboard, and plastic.
- **Disadvantages:** Plotters are quite large and also also much more expensive.



Non-Impact Printers

- **Label and Postage Printers:** A label printer is a small printer that prints on an adhesive-type material that can be placed on a variety of items such as envelops, packages, CDs, DVDs, photographs, file folders, toys.
- Most label printers also print bar codes.
- Label printer uses thermal technology.
- A postage printer is a special type of label printer that has a built in digital scale and prints postage stamps.

Non-Impact Printers

- **Braille Embosser :** A braille embosser is a device that can generate printed material using the braille writing system for blind or visually impaired users.
- They press dots down onto a piece of paper to let a person using the braille system read by using their fingers. They are a form of assistive technology.
- A braille embosser is also known as a braille printer.
- Braille is a system of raised dots that can be read with the fingers by people who are blind or who have low vision. ... Braille is not a language. Rather, it is a code by which many languages—such as English, Spanish, Arabic, Chinese, and dozens of others—may be written and read.

Non-Impact Printers

Non-Impact Printers

- **3D Printer :** A 3D printer is a computer-aided manufacturing (CAM) device that creates three-dimensional objects.
- Like a traditional printer, a 3D printer receives digital data from a computer as input.
- However, instead of printing the output on paper, a 3D printer builds a three-dimensional model out of a custom material.
- 3D printing uses computer-aided design (CAD) to create three-dimensional objects through a layering method. Sometimes referred to as additive manufacturing, 3D printing involves layering materials, like plastics, composites or bio-materials to create objects that range in shape, size, rigidity and color.

Non-Impact Printers