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CHAPTER 1

DIGITAL LITERACY (ADVANCED)

Objective of Learning

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- 1.2 *Digital screens (LED, LCD and Plasma)*
- 1.3 *Digital Graphic Plotter*
- 1.4 *Different Types of Printers*
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INTRODUCTION

In the early 1980s-1990s, overhead projectors were used as part of a class room as a projection system. An overhead projector is a simple and reliable form of projector. Over head projectors are used to project images or written material on a wall or screen.

Overhead Projector : An overhead projector is a machine that has a light inside it and can be used to make the writing or pictures on a sheet of plastic appear on a screen or wall. The abbreviation OHP is also used.

Parts of an overhead projector (OHP) :

An overhead projector has following parts :

1. Lamp and Reflector - The lamp is the light source, and it is found on the base (box) of the overhead projector. The reflector is placed being the lamp, so that it can direct the light forward toward a mirror. The reflector prevents light from being spread inside the base. If there wasn't a reflector, the image being projected would be very dim. The condenser is used to focus or condense the light onto the mirror, it is positioned between the lamp and the mirror in the base.

2. Blower - It is important to have a cooling fan because the base unit produces a large amount of heat, and the overhead projector requires a fan to prevent it from blowing out.

3. Base Mirror - A mirror can be found in the base unit, which is at an approximate angle of 45 degrees. This mirror is there to change the angle of the light produced by the lamp and reflector from its original horizontal direction. Then light is reflected and directed upward by this mirror through the projector's stage.

4. Projection Stage -This is a glass surface where transparencies are placed to be projected. The projection stage is also where the Fresnel lens are placed to focus and magnify the image upward.

Fig. Different types of Projectors

5. Upper Section - Above the stage, there are more parts that consist of a focusing knob, an objective lens that admits light sent through the Fresnel lens and another mirror to guide the image ahead onto the wall/screen.

1.1 HANDLING OF OVERHEAD PROJECTORS

1. Cover the transparency when you are done using it-with an opaque piece of cardboard mount a solid sheet of paper on one of my transparency frames. You may also turn off the projector completely, but beware, this can cause the projector bulb to burn out sooner.

2. Bring a spare bulb. Bring spare bulbs and a glove to change the bulb. The old bulb will be hot. Make sure you know how to change the bulb. Remember hot glass looks the same as cold glass!

3. Place the overhead to your right if you are right handed and to your left if you are left handed-This will make it easier for you to face your audience and write if you need to. In either case, you want to stand in the center of the speaking area and face the audience when you speak.

4. Place your overhead projector on a table low enough so it does not block you or the screen. Have a small table next to the overhead so you can stack your overheads before and after you use them.

5. Tape the power chord to the floor-to protect you or someone else from tripping. As the presenter, tripping over the chord and falling, although humorous, is one large gesture you would prefer to avoid.

6. Store your overhead transparencies in a sturdy box or container so they will stay clean and protected for the next time you need them. Label the box and include a "clean" copy of your handouts in the box.

1.2 DIGITAL SCREEN (LED, LCD AND PLASMA)

1.2.1 LED

The Light emitting diode (LED) is a two-lead semiconductor light source. In 1962, Nick Holonyak has come up with an idea of light emitting diode, and he was working for the general electric company. The LED occupies the small area which is less than the 1 mm^2. The applications of LEDs used to make various electrical and electronic projects.

The lighting emitting diode is a p-n junction diode. It is a specially doped diode and made up of a special type of semiconductors.

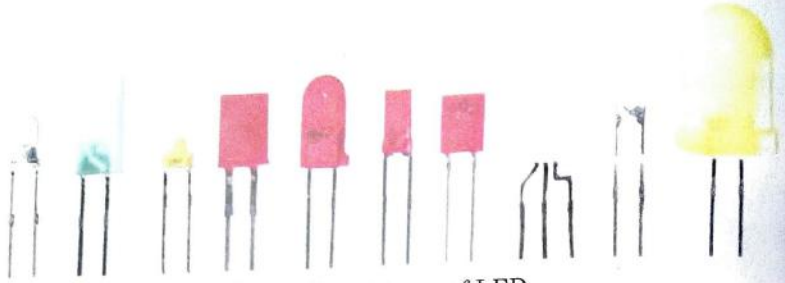

Fig. Different types of LED

The LED has following applications :

1. LED is used as a bulb in the homes and industries.
2. The light emitting diodes are used in the motorcycles and cars.
3. These are used in the mobile phones to display the message.
4. At the traffic light signals led's are used.

Advantages of LED's :

1. The cost of LED's is less and they are tiny.
2. By using the LED's the electricity is controlled.
3. The intensity of the LED's differs with the help of the microcontroller.

1.2.2 LCD

LCD, stands for liquid crystal display is a flat, thin display device that has replaced the older CRT display. LCD provides better picture quality and support for large resolutions.

Generally, LCD refers to a type of monitor utilizing the LCD technology, but also flat screen displays like those in laptops, calculators, digital cameras, digital watches, and other similar devic

Fig. LCD

Most LCD computer monitors have a connection for HDMI and DVI cables. Some still support VGA cables but that's much less common.

Applications of Liquid Crystal Display (LCD) :

1. Liquid crystal technology has major applications in the field of science and engineering as well as on electronic devices.
2. Liquid crystal thermometer.
3. Optical imaging.
4. Used in the medical applications.

Advantages of an LCD :

1. LCD's consumes less amount of power compared to CRT.
2. LCD's are consist of some microwatts for display in comparison to some mill watts for LED's.
3. LCDs are of low cost.
4. Provides excellent contrast.
5. LCD's are thinner and lighter when compared to cathode ray tube.

Disadvantages of an LCD :

1. Require additional light sources.
2. Range of temperature is limited for operation.
3. Low reliability.
4. Speed is very low.

1.2.3 PLASMA

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, somewhat like a tiny neon light. Plasma displays are thinner than cathode ray tube (CRT) displays and brighter than liquid crystal displays (LCD). Plasma displays are sometimes marketed as "thin-panel" displays and can be used to display either analog video signals or display modes digital computer input.

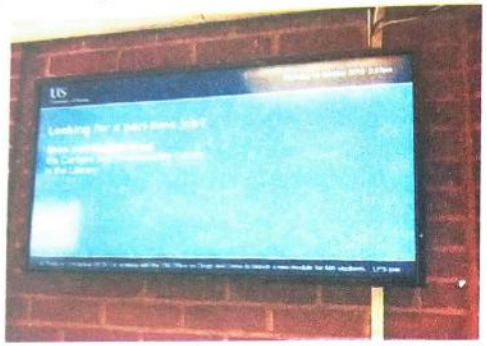

Fig. Digital Screens Plasma

Advantages of Plasma :

1. Better than CRT display.
2. More Compact than CRT.
3. Better Contrast Ratios.
4. Wide Viewing Angle.
5. Less Visible Motion Blurs.
6. Superior Uniformity.
7. It can display 16.77 million colors.
8. It offers high resolution.
9. It can display HDTV compliant signals.
10. It offers widescreen 16:9 ratio display.
11. It is slim and light in weight.

Disadvantages of Plasma :

1. Susceptibility to Degradation.
2. Flickering Effects.
3. Higher Power Consumption.
4. More Expensive.
5. Altitude Considerations.
6. They have shorter life span and there is no option to repair burnt out tube or backlight.
7. Plasma TV technology are very fragile and hence TV units are very easy to damage.
8. Prices are very high.
9. They have potential to burn-In.
10. They have lower brightness levels.

1.3 DIGITAL GRAPHIC PLOTTER

Plotter is an output device. A device that draw picture on paper before, based on command from a computer. Plotter differ from printers in that they draw lines using a pen. As a result they can produce continues lines where as a printer can only simulates lines by printing a closely spaced series of dots.

How Does a Plotter Work?

Computer plotters are a type of output device commonly used for computer-aided design applications, to output large vector designs such as architectural blueprints. By moving a pen mechanically, plotters draw line art onto the surface of the paper to reproduce vector graphics drawn on a computer. Although ideal for printing large line art graphics, plotters could not reproduce raster graphics, and the introduction of wide format inkjet and laser printers have rendered them largely obsolete.

There are two main types of plotters for printing :

(i) flatbed plotters and

(ii) drum plotters.

Fig. Plotter

(i) Flatbed Plotters : Flatbed plotters use a system where the paper is fixed, and the plotter moves a pen up and down, and left and right to draw the required marks on the paper.

(ii) Drum Plotters : Drum plotters move the pen up and down, and the paper left and right by rotating the drum. This enables drum plotters to have a footprint smaller than the final paper size. Plotters can use more than one pen, allowing different colors to be drawn.

1.4 DIFFERENT TYPES OF PRINTERS

Printer : A printer is a device that accepts text and graphic output from a computer Printer transfers the information to paper, usually to standard size sheets of paper. Printers vary in size, speed, sophistication, and cost. In general, more expensive printers are used for higher-resolution color printing.

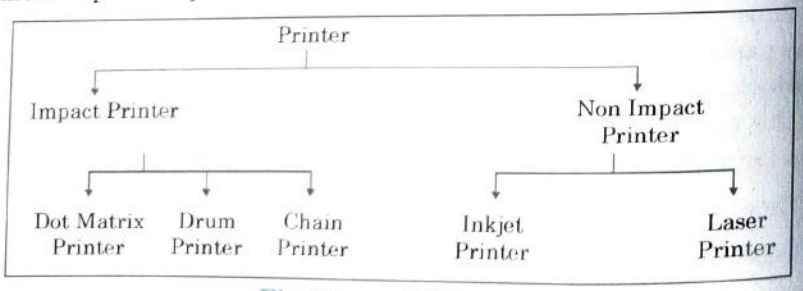

Fig. Types of Printers

1.4.1 Laser Printer :

The print quality of these printers is very fine. They are more expensive than other printers like dot matrix, inkjet etc. These are also known as page printers because they print one page at a time. They produce images on paper by directing a laser beam at a mirror which bounces the beam on a drum.

Fig. Laser Printer

Advantages of Laser Printers :

1. These printers have high printing speed and can print around 30 pages in one minute.
2. They are quiet while working and barely emits any sound.
3. Quality of printing is very good and can print images with high resolution.
4. Cost of printing per page is low as compared to inkjet printers.
5. Ink used for taking printouts is not sensitive to water.
6. Good for high volume printing.

Disadvantages of Laser Printers :

1. More expensive than inkjet printers.
2. Except for high end machines, laser printers are less capable of printing vivid colors and high quality images such as photos.
3. The cost of toner replacement and drum replacement is high.

4. They are bulkier than inkjet printers.

5. They need time to warm up before starting printing.

1.4.2 Inkjet Printer :

These are the character printers that lie in the category of non-impact printers. It has a print head with tiny nozzles that spray ionized tiny drops of ink onto a page to create an image. This is achieved by using magnetized plates which direct the ink's path onto the paper in the desired pattern. The dots are positioned very precisely, with resolutions of up to 1440 × 720 dots per inch (dpi). The dots can have different colors combined together to create photo-quality times images which almost matches the quality of a laser printer. Almost all ink-jets offer a color option as standard, in varying degrees of resolution and can also be used as a regular black and white printer.

Fig. Injket Printer

Advantages of Inkjet Printers :

1.Cost of printer is low.

2. High quality of output, capable of printing fine and smooth details.

3. Capable of printing in vivid colors and suitable for printing graphics like pictures or charts.

4. They are easy to use and can be used without any prior training.

5. They are easy to use and can be used without any prior training.

6. They are quieter than dot matrix printer.

7. No warm up time is required before printing the job.

Disadvantages of Inkjet Printers :

1. Print head is less durable, prone to clogging and damage.

2. Ink cartridge are expensive if they need replacement.

3. Not good for high volume printing.

4. Printing speed is not as fast as laser printers.

5. Highlighter or markers cannot be use on inkjet printouts.

1.4.3 Dot Matrix Printer :

These printers are very popular and heavy duty. Its cost is low having high speed and fine letter quality output. These printers print each character as a pattern of dots. The print head consists of a matrix of small and tiny needles i.e. 5 × 7 (five rows and seven colours) or 9 × 7 (9 rows and seven colours) where rows and column are represented by needles.

Fig. Dot Matrix Printer

Advantages of Dot Matrix Printer :

1. They can print on multi-part forms or carbon copies.

2. Cost of printing per page is quite low.

3. These printers can print on continuous paper. This allows user to print long banners that span across several sheets of paper.

4. They are relatively reliable and durable as compared to other printers.

Disadvantages of Dot Matrix Printer :

1. They are very noisy due to striking mechanism.

2. Print quality is not appreciable.

3. Printing speed is low, Because each dot is individually printed, a significant amount of time is required to print even one page of paper.

1.4.4 Drum Printers :

Drum printers are line printers that print entire line at one time. A typical arrangement of a drum printer involves a large rotating drum mounted horizontally and positioned in front of a very wide, inked ribbon, which is positioned in front of the paper itself. The drum contains characters molded onto its surface in columns around its circumference; each column contains a complete set of characters (letters, digits etc.) running around the circumference of the drum.

The drum spins continuously at a very high speed. When the desired character for the selected position rotated around to the hammer line, the hammer hit the appear fro behind and pushes it into the ribbon and onto the character. Hence the drum would have to complete one full revolution to print each line of output.

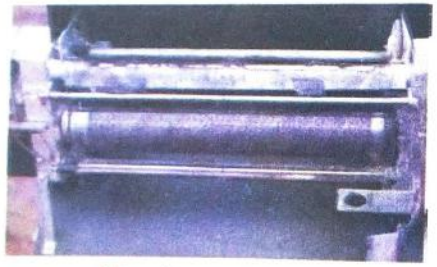

Fig. Drum Printer

Advantages :

1. They can be used to produce multiple copies.

2. They are fast and can print 300 to 2000 lines per minute.

Disadvantages :

1. The drum of a drum printer is very expensive and cannot be changed often.

2. Drum printers can print only predefined set of characters in pre-defined style only that is embossed on the drum.

3. Drum printers can not be used to print graphics such as charts & images.

4. They are noisy and produce sound while in operation.

1.5 FAX MACHINE

Fax machine device that sends and receives printed pages or images over telephone lines by digitizing the material with an internal optical scanner and transmitting the information as electronic signals.

The transmissions it sends are called "faxes," and these can be sent between two fax machines, or between a fax machine and computer or online fax service that is equipped to send and receive faxes.

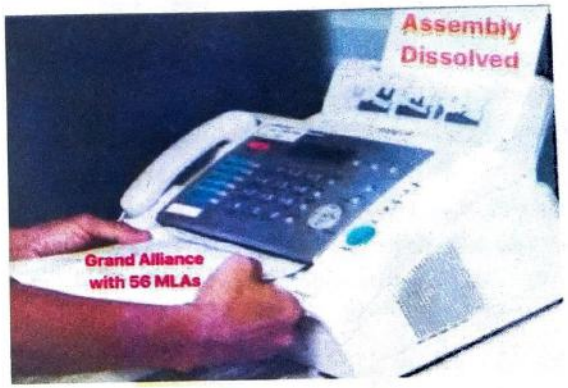

Fig. Fax machine

Today's fax machine is less frequently a stand-alone machine and more often part of a multifunction unit that also has printing, scanning, and copying features.

Uses of fax machine's : Fax machines are used to transmit documents between locations.

The majority of the time these are business documents. However, there is still some personal use of fax transmission, especially with the generations that grew up with them.

1.6 SPEAKERS

Spekers are an output device. They receive audio input from the computer's sound card and produce audio output in the form of sound waves. It is used to listen sounds from comptuer. Speakrs are present in different shapes. Generally there are two speakers attached with one computer. Most computers have speakers of low power and quality built on, when external speakers are connected they disable the built in speakers.

Fig. Speakers

Computer speakers range widely in quality and in price. Computer speakers sometimes packaged with computer systems are small, plastic, and have mediocre sound quality. Some computer speakers have equalization features such as bass and treble controls. Bluetooth speakers can be connected with a computer by using an Aux jack and compatible adaptor.

Just Remember

1. An overhead projector is a machine that has a light inside it and can be used to make the writing or pictures on a sheet of plastic appear on a screen or wall.
2. The LED is a special type of diode and they have similar electrical characteristics of a pn junction diode.
3. Plotter is an output device. Plotter differ from printers is that it draws lines using a pen. As a result it can produce continues lines where as a printer can only simultates lines by printing a closely spaced series of dots.

4. The print quality of the laser printers is very fine. They are more expensive than other printers like dot matrix, inkjet etc. These are also known as page printers because they print one page at a time. They produce images on paper by directing a laser beam at a mirror which bounces the beam on a drum.
5. Dot matrix printers print each character as a pattern of dots. The prints head consists of a matrix of small and tiny needles i.e. 5×7 (five rows and seven colours) or 9×7 (9 rows and seven colours) where rows and column are represented by needles.
6. In Impact printer, hammers or pins strike against a ribbon and paper to print the text. This mechanism is known as electro-mechanical mechanism.
7. Character printer prints only one character at a time. It has relatively slower speed. e.g. Dot matrix printers.
8. Fax machine is a device that sends and receives printed pages or images over telephone lines by digitizing the material with an internal optical scanner and transmitting the information as electronic signals.
9. Speakers is an output device. They receive audio input from the computer's sound card and produce audio output in the form of sound waves. It is used to listen sound from computer. Speakers are present in different shapes.

EXERCISE

Fill in the blanks

1. An overhead projector is a simple and ..... form of projector.
2. Projector stage is a glass surface where ..... are placed to be projected.
3. Plotter is an ..... device.

True or False

1. Printers are only black and white. ☐
2. Laser printer is an electro static digital printer. ☐

3. The transmissions send by the fax machine are called faxes.
4. Speakers receive audio input from the computer's sound card.
5. Overhead projector are used in class room.

Short Answer Type Question

1. What is LED ?
2. What do you know about LCD ?
3. What are the advantages of LCD ?
4. What is plasma ?
5. What is plotter ?
6. Name the different type of printers.
7. Describe the laser printer.
8. Describe the parts of overhead projector.
9. Write the uses of fax machine.

Long Answer Type Question

1. Describe the parts of overhead projector.
2. Describe the points to the kept on mind while handling an overhead projector.
3. Describe any two digital screen.
4. What do you mean by LCD ? What are the advantages and disadvantages of LCD ?
5. What is plasma ? What are its advantages and disadvantage ?
6. Write the brief note on digital plotter.
7. Describe the different types of printers.
8. What do you mean Plasma ? What are the advantages of plasma ?

Answers Key

1. reliable, 2. transparencies, 3. output,
1. False, 2. True, 3. True, 4. True, 5. True.

CHAPTER 2

NETWORK AND INTERNET CONCEPTS

Objective of Learning

- 2.1 *Introduction to Network*
- 2.2 *Classification of Network (LAN, MAN, WAN, PAN)*
- 2.3 *Difference between Networks*
- 2.4 *Introduction to Internet*
- 2.5 *History of Internet*
- 2.6 *Types of Web Browsers – Internet explorer, Google Chrome, Opera, Mozilla, Firefox*
- 2.7 *Browsing internet through various search engines such as Google, Yahoo, Bing etc.*
- 2.8 *E-Mail*

2.1 INTRODUCTION TO NETWORK

This is the era of fast moving electronic world. Internet becomes the necessary part of everyone. So dynamic world today needs fast communication channels to move data frequently from one place to another, so data transmission over distances has become essential, To move the data quickly from one place to another, the concept of networking has been introduced. In networking the