BACHELOR OF COMPUTER APPLICATIONS

SEMESTER 3

DCA2103

COMPUTER ORGANIZATION

Unit 11

Peripherals

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1. INTRODUCTION

In the previous unit, you have studied the concept of DMA in the I/O organization and other concepts relating to I/O such as synchronous and asynchronous data transmission, PCI bus, etc. We all know that the computer will not have any utilization if it is not able to communicate with the outside world. A computer should have a system to extract information from the external world and should have the ability to communicate the results to the outside world. As you are aware that the input is entered in the form of programs and data into the computer memory for processing and results obtained from computations are recorded or displayed to the user.

We have seen that the CPU is the unseen part of a computer and users are not very aware of it. But users are very much knowledgeable about the input and output parts of the computer. Users submit data as input to the computer and get processed information as the output. You must be knowing that the most common means of providing input to a computer is through a keyboard and a mouse. Keyboard allows a person to enter alphanumeric information directly and a mouse is a pointing input device. Information received is then processed by the Central Processing Unit (CPU). The CPU process instructions perform calculations and handle the flow of information. You will find that till the information is acted upon, it stays in the storage.

After the information has been worked on, it is outputted to the user through various output devices such as a monitor, printer, and speakers. The input and the output devices enable a computer to communicate with the user.

In this unit, you will study the common peripheral devices used for providing inputs to computers and getting outputs from the computers.

1.1 Objectives:

After studying this unit, you should be able to:

- ❖ *Identify and describe various peripheral devices*
- ❖ *Identify and describe various input devices*
- ❖ *Identify and describe various output devices*
- ❖ *Explain in detail various types of visual display units*
- ❖ *Discuss various types of printers and their differences*

2. PERIPHERALS

Let us begin with the definition of peripherals. The secondary storage units of a computer as well as the input/output (I/O) devices are called peripheral devices or simply *"Peripherals".* These are the devices linked to the system unit by means of the ports on the computer. In this section, we will study the computer peripherals.

You will be surprised to know that devices that are under the direct control of the computer are said to be connected online. The peripheral devices are add-on hardware to expand a computer's abilities or improve its performance. The most common peripherals are keyboards, mouse, display units, and printers. Peripherals that offer secondary storage for the system are magnetic disks. Other input and output peripheral devices encountered in computer systems are digital incremental plotters, various data acquisition equipments, microphones, image scanners, webcams, tape drives, optical and magnetic character readers, loudspeakers, digital cameras, and analog-to-digital converters. (See figure 11.1).

Figure 11.1: Various Input-Output Peripherals of Computer System

You must know that a computer may perform various tasks considerably, given its default software configuration. But without a keyboard and a mouse, the computer cannot fully function to its optimum performance.

Thus, computer peripherals are increasingly becoming essential in every personal computer. Computer hardware components are becoming very important in the way that they allow people to communicate and interact with the computer.

We would like to tell you that certain peripherals are necessary while using a computer, like basic input devices such as your keyboard and mouse. Other peripherals, such as projectors and scanners carry out a specific function that is not required by every computer user.

A peripheral is linked to a host computer however, it is not a part of the host computer, and just relies on it. The peripheral increases the computer's capability to interact with the user.

Self-Assessment Questions - 1

1. _____is the most commonly used input device.

2. The secondary storage units of a computer as well as the input/output (I/O) devices are called peripherals. (True/False)

3. INPUT DEVICES

Let us bear in mind that instructions and data are entered into a computer by means of input devices. The data input by the human user is in the form of human-understandable language and needs to be converted into machine-readable language. This is done with the help of the input devices and the human-readable language is converted into appropriate binary form which is able to be received by the computer. Keyboard is the most commonly used input device. You must remember that numerous input devices have also been created, which do not need typing for entering information e.g., trackball, mouse, light pen, touch screen (digitizer), etc. All these devices permit the user to choose something on the CRT screen by indicating it due to which they are called pointing devices. There is also the development of voice input systems like a microphone which functions as an input device.

Different types of input devices

Now we will briefly discuss some of the common input devices used now-a-days. These devices are shown in figure 11.2

Figure 11.2: Various Input Devices

- **Keyboard:** The most commonly used input device is the Keyboard, which accepts commands from the user in the form of numbers, alphabets, and symbols. The signal from the keyboard is monitored by the keyboard controller in the computer which is an integrated circuit that processes all of the data that comes from the keyboard and forwards it to the operating system for further processing.

- **Mouse:** Another input device is the Mouse that works with the action of a click or by moving. Diagrams or drawings are made on the screen by pressing its button and moving it on the surface. Even the instructions are executed by clicking on the commands displayed on the screen.

- **Light pen:** This input device is used to directly draw the figures on the screen of the monitor.

- **Microphones (Mic):** Microphones help in inputting our voice directly into the computer or inputting music from CDs or audiocassettes by attaching them to the computer. There is a diaphragm inside the microphone.

  When you create a sound, it produces waves of pressure in the air, which push the diaphragm which in turn produces an electric signal, which is sent to the computer sound card. The sound card takes this audio signal and turns it into a digital signal. The computer records the value of the sound wave as a number.

- **Graphics tablets:** With graphic tablets, you can write directly on the computer. Using a stylus 'pen-like object', you can write on the surface of the tablet as if it were a paper. Some tablets include buttons, which can be used as a mouse. With newer versions of tablets, you can use fingers instead of a stylus.

- **Joysticks:** Joysticks are generally used for playing games on a computer. In the beginning, Joysticks were comprised of a movable stick and one or two buttons, allowing the user to operate a movement. New joysticks are a collection of a number of sticks and buttons together, allowing the user to control complex motions with a couple of finger movements.

- **Digital cameras:** Digital cameras are used to bring live images onto the screen, where some changes can also be made thereon. They are generally used in the barber's shops (to see the best hairstyle that suits the customer) or in the optical shops, etc. Now let's study about scanners.

- **Scanner:** You must be aware that an image scanner often called a scanner is a device that optically scans printed text, images, an object, or handwriting and changes it to a digital image. (See figure 11.3 for atypical desk-top scanner) Scanners have the ability to scan pictures, typed documents, even handwriting, and graphics into a computer. They can also scan photographs clearly and convert them into a computer file i.e., bmp, jpeg, etc.
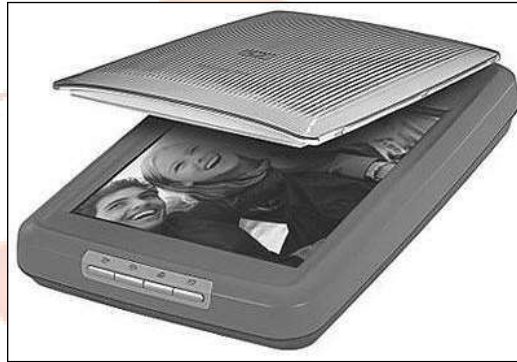

Figure 11.3: A Desktop Scanner

Early scanners had the capacity to identify only text printed in a particular OCR (optical character recognition) typeface. A scanner transforms the image that it sees, into numeric digits prior to storing it in the computer. Such a conversion process is called digitizing.

Types of scanners: Depending on the type and volume of material to be scanned, you can utilize a sheeted scanner, a drum scanner, a small handheld scanner, or a flatbed scanner. Three major types of scanners are:

i. **Flatbed scanners:** The most common type of scanner is the flatbed scanner, so named because of its flat glass bed which serves as the scanning area and surface for laying objects down to be scanned. A diagrammatic representation of a flatbed scanner is given in figure 11.4.
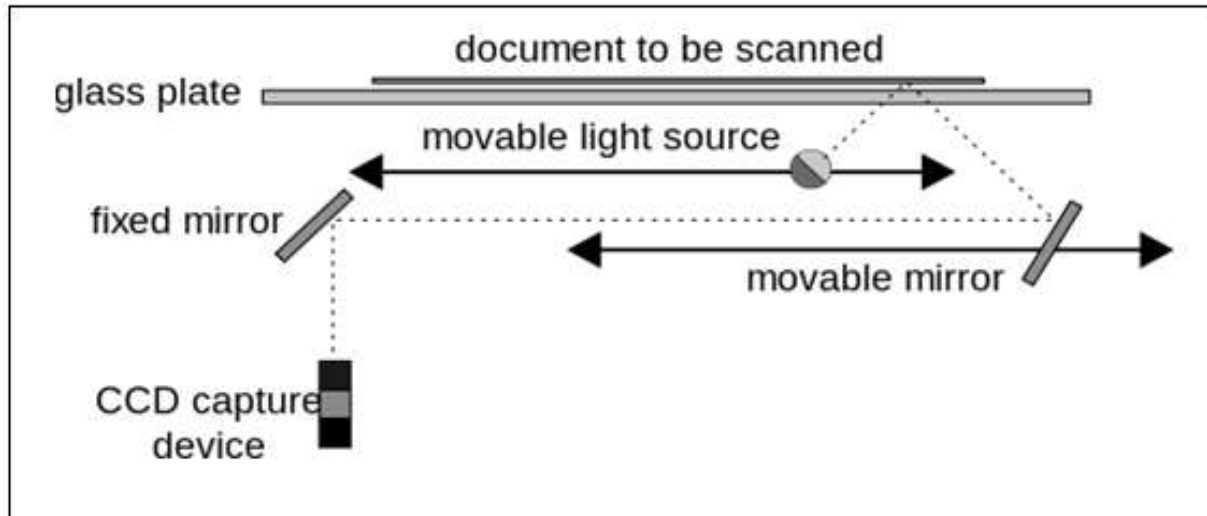
Figure 11.4: Flatbed Scanner

ii. **Film scanners:** These scanners allow you to scan photographic slides, which are small and need higher scanning resolutions than images and documents. These can scan only transparencies such as photographic negatives and slides.

iii. Drum scanners: Drum scanners produce scans that are superior in resolution, color grade, and value structure. They are capable of resolutions up to 24,000 PPI. Professional color trade shops use drum scanners for producing color separations for high-end printing. Drum scanners can develop more scans/hour than a flatbed unit.

You will find that table 11.1, summarises the main differences between film, flatbed, and drum scanners.

Table 11.1: Differences between Flatbed, Film, and Drum Scanners

Scanner Type	Scanner Expense	Difficulty of Operation	Flexi-bility	Film Scan Quality	Scan Speed	Batch Scanning Capabilities?
Flatbed	Low to Moderate	Easy	High	OK Good (with fluid mounting)	Moderate	Minimal
Film	Moderate to High	Easy To Moderate	Low to Mode-rate	Very Good (better withfluid mounting)	Fast	Moderate (with feeder attachments)
Drum	High	Very Hard	Moderate	Exellent	Slow	None

You must be surprised to know that in the early 90s, a full-page scanner's cost was around 5-6 times the cost of scanners available these days. These devices are kept between the monitor and the keyboard and can store documents on the disk for the purpose of archive, sending e-mail and interfacing with a fax machine. In 1995, when the manufacturers saw that the users are reluctant to use scanners, they reduced the price of the small paper scanners by 40-50%.

Self-Assessment Questions - 2

3. _____is a conversion process used by scanners.
4. Scanner is a type of output device. (True/ False)

4. OUTPUT DEVICES

Did you know that input is converted from human-readable form to machine-readable electronic form before entering it into the computer for processing? The result produced after processing is also in machine-readable (electronic) form. It is neither a convenient nor a desirable form of output for the user. Users cannot understand results represented in the form of electronic signals. They would like to have the output in human-readable form. It is through output devices that this task is performed. Output devices convert the machine-readable output into human-readable form. Some of the common output devices available in the market are given in figure 11.5.

Figure 11.5: Some Output Devices

You must remember that sometimes, the output of the processing is required to be fed to another machine, which can receive an electronic form of data. The output of a computer may also be stored on a storage device. But if the output is not in the form which another machine accepts, then a conversion is needed. An output device also does this conversion.

A computer output device converts the machine-readable electronic form of the result into another desired form. This desired form may be in human-readable form or a form recognized by another machine as shown in figure 11.6.
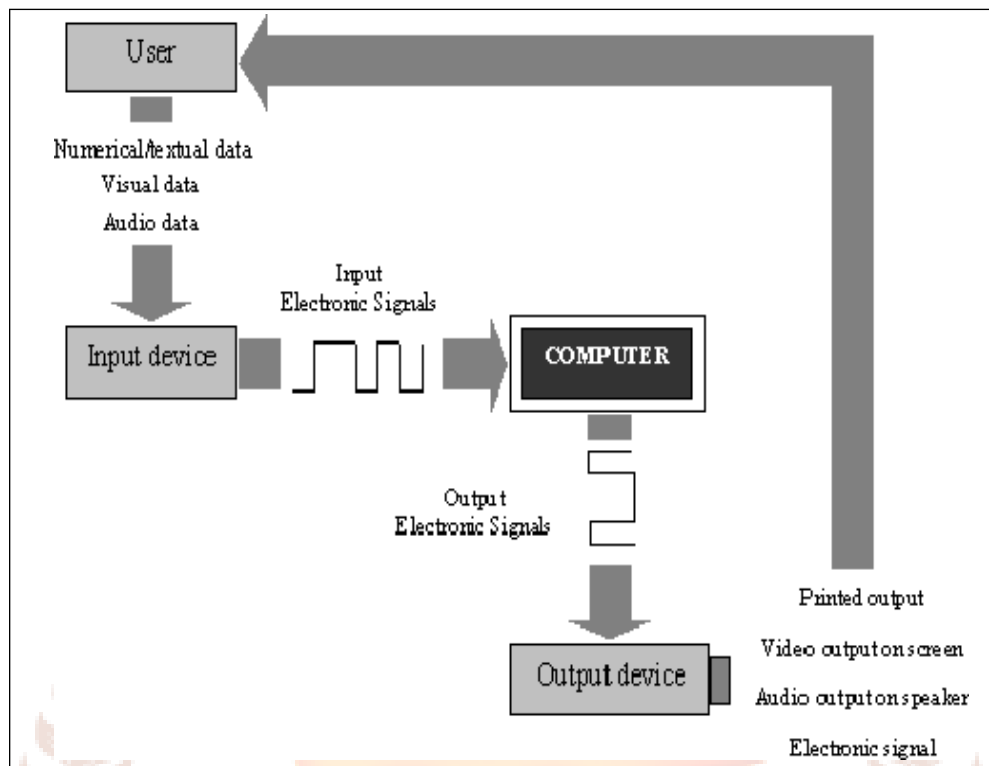
Figure 11.6: Function of an Output Device

We will now discuss in detail some of the common output devices.

4.1. Visual Displays

As you know, computer output is most commonly viewed through a monitor. The monitor helps the user show a preview of what a hard copy output will look like and make any changes if required. At times, while watching television, you may observe that the picture seems a bit snowy. This happens due to the image being a matrix of dots and not a solid one-piece image. These dots or picture elements (also known as pixels) join to create the image you observe. Higher the picture elements more improved is the resolution of the image. The more improved the resolution, the finer the picture. Computer monitors are just like television screens.

Classification of VDU/Monitors: Broadly two kinds of monitors are available:

• LCD (Liquid Crystal Display) monitors.

CRT (Cathode Ray Tube) monitors. The large monitors which you see linked to desktop computers are CRT (Cathode-Ray Tube). Such a type of CRT Monitor is depicted in figure 11.7.

Figure 11.7: CRT Monitor

Monitors that are utilized on notebook computers, as well as laptops, are called flat-panel displays. These Flat-panel displays have a low weight and consume less electricity as compared to CRTs.

General kinds of flat-panel displays are:

- Liquid Crystal Displays (LCDs)
- Electro Luminescent (EL) displays
- Gas Plasma (GP) displays

You must know that flat-panel display monitors are costlier than CRTs, however ultimately their prices are anticipated to decrease. Just imagine a monitor hanging on the wall similar to a painting. This may be a common sight in a few years. One such LCD monitor is shown in figure 11.8.

Figure 11.8: LCD Monitor

The majority of new monitors are Super Video Graphics Adapters (SVGA), which contain 1024 by 768 in a high-resolution pixel configuration and 800 by 600 in low-resolution mode. The first number signifies the horizontal pixel count, while the next is the vertical pixel count. A clearer and more detailed image is provided by the higher resolution, containing more pixels. Every pixel shows one color at a time. Every color is depicted by a numeric code. For instance, bright red might be 12. Whenever the monitor shows only 16 colors, the numeric code has the ability to be depicted with only four bits. In order to show 256 colors (each one with its own code) needs eight bits.

You must remember that another important element of the resolution is the dot pitch. Two monitors having the same pixel configuration may show a variation in sharpness in its view due to a difference in dot pitch. Such a dot pitch depicts the distance between pixels. A crisper image is given by a 0.28 dot pitch as compared to a 0.30 dot pitch. The 0.28 dot pitch is quite standard. The dot pitch is fitted by the manufacturer and cannot be modified. You can see the comparison of CRT and LCD monitors' properties in table 11.2.

Table 11.2: Characteristics of CRT and LCD Monitors

	CRT	LCD
Technology	Single Cathode Ray Tube scans the screen activating phosphor atoms ("lightning storm in a bottle").	Thin Film Transistors (TFT) are used to switch individual pixels on and off (shutter effect like venetian blinds)
Front Panel	Glass	Usually acrylic (glass can be available as an option)
Size	Very deep due to tube	around 100mm deep
Weight	Heavy	under 30kg for 40"
Installation Flexibility	Poor due to size & weight	Excellent
Cost	Low (mature technology)	Very high (new technology)
Life Expectancy (there are many variables here & no clear preference)	Tube life around 30,000 hours depending on application - retains brightness uniformity well	30-60,000 hours or more depending on application (backlight can be replaced in some cases)
Resolution	Not pixel technology so relies on faster scanning (up to 135kHz)	up to 1920 x 1080 (full HD) for 42"+ screen sizes
Video Display Performance	Excellent - fast response times well suited to fast moving images	Depends on the ability of the liquid crystals to switch quickly(refresh rate). Refresh rate < 8msec recommended for video applications. The slower the refresh rate & the larger the screen - the more noticeable the image lag
Data Display Performance	Good (must be high resolution)	Very good due to higher resolutions available
Screen Size (currently shipping)	up to 37"	up to 65"
Viewing Angle	around 160° arc (no loss of contrast & saturation)	around 160° arc (can lose contrast & saturation at wider angles but this is improving with newer models)
Operating Temperature	Good	Poor at low temperature (response times slow down)
Burn-in/Image Retention	Phosphor burn-in of static images	Image retention of static images causes uneven display across panel
Power Consumption (all black)	Poor	Poor
Power Consumption (all white)	Poor	Good
Brightness	OK	Good
Contrast Ratio	1000:1 max	1000:1 max
Colour Reproduction	Good	Poor (depends on performance of colour filter & viewing angle)
Colour Uniformity	Good	Variable (especially in corners & at edges)

Monitors have now become the most essential component of a computer. It helps the users to view complex graphics, video clips, and animated objects. Users now possess a variety of sizes to choose from.

Desktop microcomputer systems are best paired with fourteen-inch to seventeen-inch monitors. There are other larger sizes of monitors available, but they are comparatively expensive.

Display screens or monitors are available in color monitors or black and white (monochrome). Monochrome monitors are increasingly becoming an obsolete technology as the majority of applications today need a color screen.

Actually, 256 colors display is generally compulsory for functioning with clip-art collections and informational CD-ROMs. A graphics adapter board (also called a video card) is required to connect a monitor to a microcomputer. Every kind of monitor needs a different kind of board. These are shown in Figure 11.9.

Figure 11.9: Graphics Adapter Board to Connect Computer and the Monitor

The graphics board plugs into an expansion slot inside the computer and the monitor plugs into the board. Now let us study about printers in the next section.

4.2. Printers

You must be aware that printer is one of the most important output devices in a computer, which is used to print information on papers. It is a hardware device which helps to take hard copies of documents from the computer. Printers are necessary for attaining the output of any computer-based outcome. Let us discuss the various types of printers.

Types of Printers: Printers can be categorized into two types based on the technology they utilize to print on paper. They are:

- Impact Type
- Non-Impact Type

Printers can also be classified on the basis of print technology. The most common ones are inkjet printer, dot-matrix printer, laser printer and thermal printer. Dot-matrix printer is the sole impact printer while the others are non-impact printers. When a portion of the printer compresses the paper to create the character, the printer is known as an **impact printer.** Impact printers are capable of producing carbon copies and are quite loud, though covers are available to quieten the noise. On the contrary, **non-impact printers** are fairly silent. However, as nothing compresses the page, a non-impact printer is not able to produce carbon copy. Such a fact is generally not a problem because it is quite simple to produce multiple originals, but at times carbons are needed for legal reasons.

Impact Printers: Let us remember that impact printers create image or text by physically making the print head to push the ink ribbon and make the ink deposit on the paper in the desired form. Impact printers are able to produce a line, a page, or a character at one time. The main disadvantage of impact printers is that they are not able to produce graphics and produce only text. Besides, they are very noisy. Class of printers using impact technology are:

- Dot-matrix
- Line printer
- Daisy wheel
- Pen based plotter
- Typewriter-derived
- Teletypewriter-derived

A dot matrix printer forms the characters that it prints, by putting ink at particular dot locations inside a grid (matrix). Figure 11.10, for instance, depicts the way a dot matrix printer may create the number 21. The higher the number of dots the printer utilizes to form a character, the clearer is the image of the character.

Figure 11.10: Dot Locations within Grid (matrix)

If you utilize a magnifying glass to have a peek at a report formed with a dot matrix printer, you will see the small dots creating each character. A line printer is one type of dot matrix printer which prints one line at one time. The speed of their printing is quite greater than character printers. They are again of two types – Drum Printers and Chain Printers.

- **Drum Printers** are those printers that print the line by a rotating drum consisting of a ring of characters for every print position. The hammers strike every character of the drum at the same time so that the whole line is printed for a single complete rotation of the drum. Such printers are also known as Barrel Printers. The printouts attained from such printers, possess even character spacing but uneven line height.
- **Chain Printers** are the printers which print the line with the help of a rotating chain consisting of ring characters for every print position. Their printing mechanism is just like drum printers. The printouts attained from these printers, consist of uneven character spacing but even line height.

Non-impact Printers: Let us find out more about these printers. Non-impact printer is that category of printers that prints the characters with no striking against the ribbon as well as on the paper. Such printers print an entire page at one time and so are also known as Page Printers.

Non-impact printers are the most popular types of printers used nowadays. It is mainly because of the following reasons:

- They produce improved print quality along with diminishing cost.
- Non-impact printers are able to produce both texts as well as graphics.
- Non-impact printers are fairly quiet in operation as compared to impact printers.

Class of printers using non-impact technology are:

- Liquid ink (Inkjet printers)
- Tonner based (Laser printers)
- Thermal printers

Now let us study briefly these three types of non-impact printers.

Ink-jet Printers: Ink-jet printers are also popular among personal computer users (see figure 11.11 for such a type of printer). The resolution is lower in ink-jet printers as compared to laser printers; however, it is higher compared to that of dot matrix printers. Such printers print the characters with the help of spraying the paper with electrically charged ink. Such printers offer better quality as compared to impact printers but not better as compared to laser printers. They are less expensive than laser printers, so are used extensively in many offices. They also provide an option of utilizing color cartridges for multi-color printing.

Figure 11.11: Ink-jet Printer

Colour ink-jet printers, that utilize multiple nozzles, are available at quite affordable prices. A well-equipped office at the workplace includes a full sheet scanner, an ink-jet printer, a copier, and a fax machine (with its own telephone). A current addition to the market is a kind of ink-jet printer which performs all these four functions.

Laser Printers: Laser printers work in a similar way as that copying machines such as Copier Machines/Copier. A laser beam forms electrical charges which attract the toner to create an image and move it to paper. The printer uses laser and electrophotographic methods to print an entire page at one time. The laser is utilized to "paint" a charged drum along with light, to which the toner is applied and thereafter transferred onto paper. See figure 11.12.
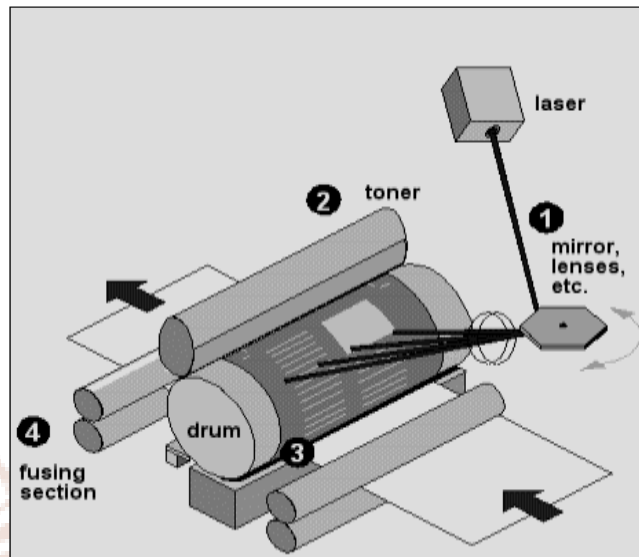
Figure 11.12: Internal Structure of a Laser Printer

Laser printers are available in a variety of sizes; usually the bigger and quicker the printer, the more costly it is. Large laser printers are utilized with desk-top computers and mainframes here high-quality graphic output is needed. Small, "personal" laser printers are appropriate for use at home and small offices. Printer companies recently have even started the production of wireless laser printers. These wireless laser printers allow the user to shine a document from the laptop to an infrared receiver facing the printer. The laptop/desktop requires that a fixed infrared transmitter be installed; however, cables or wires are not needed.

The Laser mechanism: The laser printer utilizes electrostatic charges to:

5. From an image on the drum
6. Stick the toner to the image
7. Move the toned image to the paper
8. Blend the toner into the paper

The laser forms the image by "painting" a negative of the page to be printed on the charged drum. In the place where the light falls, the charge is dispersed, allowing a positive image to be printed.

Let us have a look at the main advantages and disadvantages of the impact and non-impact printers as given in the table11.3.

Table 11.3: Advantages and Disadvantages of Impact and Non-Impact Printers

	Impact Printer	**Non-Impact Printer**
Advantages	Ideal for printing multi-part forms because they can easily printthrough many layers of paper. Can normally withstand the dusty environment, vibrations, and extremetemperature.	Generally much quieterthan impact printers because there is no striking mechanism. Can produce high-qualityoutput.
Disadvantages	Generally noisy because of the strikingactivity. Produce near letter quality (NLQ) printonly, which is just suitable for printing mailing labels, envelopes, or invoices.	Cannot print multipartforms.

Thermal Printers: A thermal printer develops a printed image by heating coated thermal paper (thermochromic paper) when the paper passes over the thermal printing head. The coating turns black (where it is heated) producing an image. Two-color thermal printers can print both black and an additional color (often red) by employing heat at two different temperatures. Thermal printers are small, light, and consume less power than any other type of printer, making them perfect for retail and portable applications. You will find a comparison between Dot matrix, Inkjet, and Laser Printer is given in table 11.4.

Table 11.4: Dot Matrix Printer vs.Inkjet Printer vs. Laser Printer

Basis	Dot Matrix Printer	Inkjet Printer	Laser Printer
Technology	Dot-matrix printers form characters by means of striking pins against an ink ribbon	Ink-jet printers perform by spraying ionized ink on a sheet of paper.	Laser printer utilizes a laser beam to print.
Noise	In comparison to laser and ink-jet printers, the dot-matrix printer makes a lot of noise.	Creates less noise as compared to DMP (Dot Matrix Printer)	Does not produce noise
Price	Lowest price	Lower than Laser but higher than DMP	Costlier as compared to DMP and Inkjet
Speed	Speed is measured in characters per second (cps). It may vary from 50 to 500 characters per second	Speed is measured in Pages per Minute (PPM). Speed is less as compared to DMP.	Speed is measured Pages per Minute (PPM). 4 to 25 pages of text per minute (ppm).
Print Quality	Not very good	Better as compared to Dot matrix	Prints finest quality
Ink	Dot Matrix Printer usesribbon ink	Ink-Jet Printers make use of Ink Cartridges	Laser Printers utilize Toner Cartridges

Other output devices: You will be glad to know that apart from Video Displays and Printers, there are many other important output devices, such as speakers to produce sound, plotters, modems, etc.

Self-Assessment Questions - 3

5. A common type of flat-panel display includes;
    a. Liquid crystal displays
    b. Electroluminescent displays
    c. Gas plasma displays
    d. All of the above

6. The dot pitch is fitted by the manufacturer and cannot be modified. (True/False)

7. Companies have recently begun the production of wireless printers. (True/False)

8. The higher the number of_____ the printer utilizes to form a character, the clearer the image of the character.

9. _____is a kind of line printer which utilizes a fixed set of characters attached to a constantly revolving metal band.
    a. Band
    b. Dot Matrix
    c. Daisy Wheel
    d. Ink-jet

10. Few of the largely popular non-impact printers are _____printers and laser printers.

5. SUMMARY

In this unit, you have studied about the common peripheral devices or I/O devices used for providing inputs to computers and getting outputs from the computers. Let us recapitulate the important concepts discussed in this unit:

- Data and instruction are inserted into a computer by way of input devices
- The normally used input device is the keyboard. A variety of input devices have also been developed that do not need typing for inputting information e.g., light pen, mouse, graphic table by stick, touch screen, trackball, etc.
- Scanner is utilized for digitizing images such as documents, forms photographs, etc. in computer memory. Some scanners are also able to read text by changing them to digital code.
- Printers are the output devices that produce a printed form of the output. This printout may be taken on paper, transparency, or any other suitable printing medium.
- A low-priced ink-jet printer works quite well. Ink-jet printers usually do not print text as clearly as a laser printer since there are restrictions in the way the printer is able to spray ink precisely.
- Laser printers are high-quality printers which are well-matched for graphics or text.

6. GLOSSARY

CRT: Cathode Ray Tube

Input Devices: Devices that offer an interface between the machine and the user for inputting instructions and data.

LCD: Liquid Crystal display

MPEG: Motion Picture Expert Group

Output Devices: The output devices are used to get the results of processed input.

Peripheral Devices: Devices that are attached to the CPU through wire/cable and help in the functioning of the computer.

SVGA: Super Video Graphics Adapter

VDU: Visual display Unit

7. TERMINAL QUESTIONS

1. Explain the meaning of peripheral devices? What are the various types of peripheral devices used in the computer?
2. Explain input devices with suitable examples.
3. Describe briefly scanners and its use.
4. Discuss the various types of VDU?
5. Describe Printers and its classification?
6. Write short notes on the following:
7. a. Dot-matrix Printers
8. b. Inkjet Printers
9. c. Laser Printers

8. ANSWERS

Self Assessment Questions

1. Keyboard
2. True
3. Digitizing
4. False
5. All of the above
6. True
7. True
8. Dots
9. Band
10. Ink-jet

Terminal Questions

1. Devices that are connected to the CPU with the help of a wire are termed as peripherals. Refer Section 2.
2. Data and instructions are inserted in a computer via input devices. The data input by the human user is converted into machine-readable language. This is done with the help of the input devices. Refer Section 3.

3. A scanner changes the image which it sees into numeric digits prior to saving it in the computer. Refer Section 3.

4. On the basis of technology used, VDU can be classified into two categories i.e. CRT, LCD. Refer Section 4.

5. Printers are hardware devices which help to take print out of the documents from the computer. Refer Section 4.

6. a.   Dot Matrix Printer (or Impact Matrix Printer) is a printer that prints mainly by impact of pins striking the paper through an ink ribbon cable forming bunch of dots for printing each letter. Refer Section 4.

    b.   Ink-jet printers print the characters by way of spraying the paper with ink charged electrically. Refer Section 4.

    c.   The laser printers use the toner cartridge and it is fitted into the printer. Refer Section 11.4.
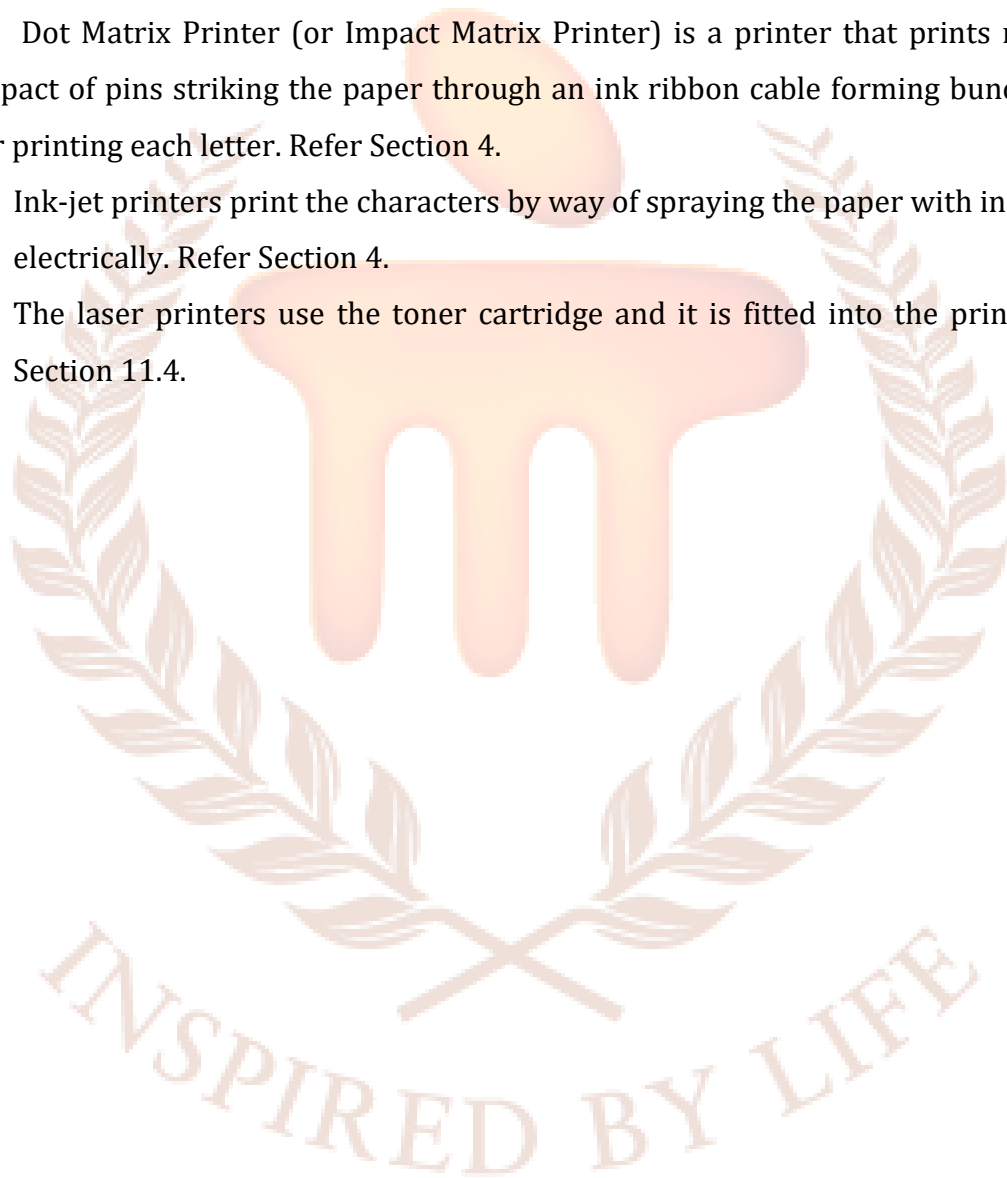
9. CASE LET: MAINTENANCE OF COMPUTER PERIPHERALS

Proper maintenance of computer peripherals varies widely by type and should be performed as recommended by the manufacturer. This article provides information on the most frequently suggested and universally applicable tasks and practices recommended for maintaining peripheral devices.

Step 1: Update the device firmware every 6 months. The term firmware refers to the software program used by the device's components to communicate with the network and perform the various tasks required to accomplish its primary function. Manufacturers are continually offering firmware updates for computer peripherals that can significantly enhance the performance of any peripheral device.

Step 2: Clean peripheral devices as needed. Dirt, dust, and debris can affect the performance of peripheral devices. Given below are some tips on how to clean peripheral devices.

- Power down the device and disconnect it from the computer prior to cleaning. Neglecting to do so could cause damage to peripheral devices.
- Use a canister/cylinder of compressed air to blow off dust particles and other debris from the exterior of the device.
- Use a damp paper towel to wipe away any dust particles that remain after using the compressed air. Use a cotton swab lightly dipped in rubbing alcohol to remove grime and dirt from inside cracks, seams, and other hard-to-reach places.
- Use a microfibre cloth to clean LCD displays, camera lenses, and device control panels. Do not use multi-purpose cleaners, which can cause serious damage to control panels, lenses, and other types of displays on peripheral devices.

Step 3: Follow the recommended maintenance schedule as directed by the manufacturer. This information can typically be found in the operating manual included with the documentation that came with the device at the time of purchase.

Step 4: Adhere to the manufacturer's recommended best practices for use. These recommendations will vary by product and manufacturer. However, some of the more common examples include the following practices.

- Power down or turn off the device when not in use. It is almost always recommended to turn off peripheral devices when not being used. When left on, devices, such as printers and hard drives, will wear out much more quickly.

- Protect peripheral devices from moisture and extreme heat. Stacking devices, placing them too close to other devices or heat sources, and storing devices in moist environments can cause significant damage.

Step 5: Use the recommended device settings. Follow the operating instructions specific to the task the device is being used for. For example,
when printing photos from a multi-function printer, confirm that you are using the correct settings and media as recommended by the manufacturer. Likewise, remember to change the settings back before printing regular documents.

Step 6: Use only the type and quality of media recommended by the device manufacturer. Peripheral devices are designed to work with specific types of media. Attempting to use media other than that recommended by the manufacturer, can seriously damage the device and often will void any warranties.

Step 7: Keep device media in a well-protected, low-traffic area. Device media is easily damaged. Media like memory cards, disks, ink cartridges, and paper should be stored in a cool, clean, dry space.

Question: Analyse the need of maintaining computer peripherals. Also, list the important steps to maintain your computer peripherals.

(**Hint**: Computer peripherals largely affect the performance of a computer system.)

Source: www.wikihow.com/Maintain-Computer-Peripherals

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