

CHAPTER 01

OVERVIEW OF COMPUTER SYSTEM

SLO-BASED MCQs

1. Which type of computer is used for nuclear research?
 - A. Mainframe computer
 - B. Minicomputers
 - C. Microcomputers
 - D. Super computers
2. Which of the following is the most powerful digital computer system?
 - A. Mainframe computer
 - B. Minicomputers
 - C. Microcomputers
 - D. Super computers
3. Which of the following is most suitable to print salary slips of 2000 employees on very cheap cost?
 - A. Laser printer
 - B. Ink jet printer
 - C. Plotter
 - D. Super computers
4. Spreadsheet is a type of:
 - A. System software
 - B. Application software
 - C. Utility software
 - D. Language processor
5. Which of the following is an impact printer?
 - A. Dot matrix printer
 - B. Laser printer
 - C. Ink jet printer
 - D. Plotter
6. Which of the following is NOT a productivity software?
 - A. Word processor
 - B. Graphics software
 - C. Spreadsheet
 - D. Windows
7. Which of the following is a pointing input device?
 - A. Scanner
 - B. Joystick
 - C. Keyboard
 - D. Plotter
8. Which of the following is NOT a social media network application?
 - A. Hotmail
 - B. Twitter
 - C. WhatsApp
 - D. Facebook
9. A barcode reader is a _____ device.
 - A. Output
 - B. Input
 - C. Storage
 - D. Processing
10. Which of the following language translator converts the entire program into machine language before execution by the computer?
 - A. Interpreter
 - B. Debugger
 - C. Compiler
 - D. Assembler
11. Which pointing device is popular with ATM machines?
 - A. Touch Pad
 - B. Trackball
 - C. Touch Screen
 - D. Light Pen
12. Which device reads the information of owner from Credit Card?
 - A. Barcode reader
 - B. Magnetic card reader
 - C. Optical scanner
 - D. Handheld scanner
13. The intermediate form between hardware and software is:
 - A. Shareware
 - B. Firmware
 - C. Freeware
 - D. Trial-ware

14. Which of the following is an example of embedded computing device?
 A. Keyboard
 B. Digital washing machine
 C. Mouse
 D. Trackball
15. Which of the following is used to process complex calculation and designing of complicated machines?
 A. Mini computer
 B. Micro computer
 C. Personal computer
 D. Super computer

SLO-BASED SHORT QUESTIONS

Q1. Define computer.

Computer is an electronic device that takes input, process it & produces output. It is a programmable machine. It is also a problem-solving machine.

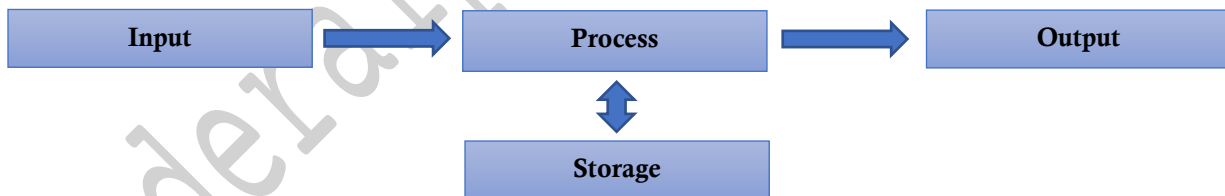
Q2. What are computing devices? Give four examples.

Computing devices

All machines, components or devices that contain embedded and specialized computers are called computing devices. For example:

- ATM machine
- Digital clock
- Digital washing machine
- Microwave oven

Q3. Draw the diagram of basic operations of computer.



Q4. Give any three application areas each of mainframe and supercomputers.

Mainframe computers are used in scientific labs, banks and universities. **Supercomputers** are used to process complex calculations, designing and controlling of complex machines like rockets and fighter planes and in nuclear research.

Q5. Compare minicomputer and microcomputer.

- Minicomputers are large and more expensive than microcomputers.
- The speed of minicomputers is measured in BIPS and microcomputers in MIPS.
- Minicomputers are multiuser and serve hundreds of users at the same time but microcomputer is used by a single person at a time.

Q6. Compare mainframe and supercomputers.

- Supercomputers are largest in size than mainframe computers.
- Supercomputers are used to perform very complex calculations while mainframes are not used for this purpose.
- Supercomputers are more fast in speed than mainframe computers.

Q7. Give any three modern uses of computer in daily life.

- **Mobile computing** refers to a variety of small portable devices that allow people to access data and information anywhere in a wireless network system. Popular devices are tablet PCs, PDAs and Smartphones.
- **Internet of Things (IoT)** is the interconnection between computer network and physical devices to collect and exchange data. Smart home is a common example.
- **Cloud computing** means instead of buying and installing your own computer system and software, you can get it as a service that is provided and managed by some other company. Gmail and Hotmail are common examples.

Q8. What is mobile computing? Give examples.**Mobile Computing**

It refers to a variety of small portable devices that allow people to access data and information anywhere in a wireless network system. These devices have limited functionality as compared to laptops. Popular mobile computing devices are *tablet PCs, PDAs* and *Smartphones*.

Q9. What is Internet of Things (IoT)? Give example.**Internet of Things (IoT)**

Internet of Things (IoT) is the interconnection between computer network and physical devices to collect and exchange data. These devices are called smart devices and they interact with human through a wireless connection.

- **Smart home** is a popular example of IoT.
- Smart homes are equipped with different types of electronic devices that can be controlled remotely with smart phone or computer through IoT system.

Q10. What is cloud computing? Give examples.**Cloud Computing**

Cloud computing means instead of buying and installing your own computer system and software at your workplace, you can get it as a service provided and managed by another company. You can perform your computing tasks through accessing the service over the internet. It does not matter where the hardware and software are located. It is just somewhere in the “*cloud*”. For example, **Gmail** and **Hotmail** provide a webmail service.

Q11. Write three advantages of cloud computing.

Advantages of Cloud Computing

- You don't have to buy and maintain a complex computer system.
- You don't worry about equipment going out of date.
- You don't worry about system security and reliability.

Q12. Write three disadvantages of cloud computing.

Disadvantages of Cloud Computing

- It requires a reliable high-speed Internet connection functioning the whole time you are working.
- There can be security and privacy risk of having valuable data on the system of someone else in an unknown location.
- We have limited control over the service as a customer.

Q13. What is the purpose of data centers?

Data Centers

Data center is a centralized location for collecting, storing, processing and distribution of large amount of data. It consists of servers, routers, switches and backup equipment. They require air conditioning rooms, fire suppression, smoke detection and security entry. They may be housed in a room, an entire building or a group of buildings.

Q14. What do you know about web applications?

Web Applications

Web application is a program that runs on a remote server. Its users interact with it through a web browser. Some common web applications include Web based email programs (*Gmail, Hotmail*), Online ticketing service, Online banking service, etc.

Q15. Write some features of Facebook social media application?

Facebook

Facebook is one of the fastest growing free social networking services. It is used by millions of people all over the world. It allows registered users to create profile and exchange messages, photos, videos and links of other users. It provides a platform by which users can create *groups* and *pages* based on their common interests to share their views and ideas.

Q16. Explain features of Twitter social media application.

It is an online news and social networking service. It allows subscribers to broadcast short messages to other subscribers of the service. Short messages known as '*tweets*' are restricted to **140** characters. It is free to join service. It is totally different from email and more like a news broadcast

Q17. What is the purpose of WhatsApp mobile social media application?

WhatsApp

It is a free instant messaging service for smartphone users. It is used to exchange on internet text, photos, videos and audio messages. It has become the largest messaging service around the world. It was started for *android* mobile devices but now It is also available for iPhone, Blackberry, Windows phone and Nokia smartphone.

Q18. What do you know about open source software? Give examples.

Open Source Software

Open source software is available in the form of source code. It allows user to study, change and improve. It is free for inspection, modification and distribution. It allows certain rights which are normally protected by copyright law. Examples are *Linux operating system* and *Open office*.

Q19. What is firmware? Give examples.

Firmware

Firmware is an intermediate form between hardware and software. It consists of software embedded in electronic devices during their manufacturing. They are used when the programs are rarely or never expected to be changed. They are also used when program must not be lost when the power is off. They are embedded in *Toys, Appliances* and *ROM*.

Q20. Write down one example of each Productivity software, Open-source software and Device driver.

- Microsoft Word is an example of *Productivity software*.
- Linux is an example of *Open-source software*.
- Printer driver is an example of *device driver*.

Q21. Differentiate between handheld scanner and barcode scanner.

- ❖ Handheld scanner is used to scan documents whereas barcode scanner is used to scan printed barcodes on the products.
- ❖ Handheld scanner converts the document into electronic form. On the other hand, barcode scanner reads the information hidden inside the barcode and converts into electronic form to create a cash bill.
- ❖ Handheld scanner is portable while barcode scanner can be portable or fixed.

Q22. Write down any one application of the following scanner types:

- a) *Handheld scanner*
- b) *Flatbed scanner*
- c) *Optical scanner*

Handheld Scanner

It is used to scan books, newspapers or magazines. It is used at homes or offices.

Flatbed Scanner

It is used to scan pages, images or other documents by placing over it. It is used in both homes and offices.

Optical Scanner

It is used to read printed text or graphics. It is used in ATM machines.

Q23. Write some features of a monitor.**Features of monitor**

- **Size:** It is measured diagonally. Standard size is 15-22 inches.
- **Color:** It can be either black and white or colored.
- **Pixel:** They are small tiny dots which forms image.
- **Resolution:** Number of pixels (or dots) per square inch is called the resolution
- **Dot Pitch:** Distance between the pixels on the monitor is called dot pitch.

Q24. How LED monitors are better than LCD monitors?

- LED monitors provide bright images and emit less radiations as compared to LCD monitors.
- LED monitors run at low temperatures and consume less power than LCD monitors.
- Lifespan of LED monitors is longer than LCD monitors.

Q25. What do you know about impact printers?**Impact printers**

Impact printers print characters and graphics by striking the surface of paper. They do not produce high quality output. They are slow and noisy. They are less expensive. The most common examples are *Dot matrix, Daisy wheel* and *Line printers*.

Q26. Differentiate between hard copy and soft copy devices along with one example of each?

Soft copy is the output in the form of data or information stored on a storage device or displayed on the screen. The files displayed on the monitor, stored in hard disk, CD or DVD are all examples of soft copy.

Hard copy is a printed document file. It is a physical copy of data or information. It cannot be edited. It is treated as a permanent copy. It is expensive to generate hard copies. *Printers* and *plotters* are used for this purpose.

Q27. Which pointing device is available in laptop? How it differs from a mouse? Give two reasons.

Touchpad is a pointing device which is used in laptop instead of mouse. It differs from the mouse in the following two ways.

- It is a flat pressure-sensitive surface whereas mouse is not pressure-sensitive and flat.

- The movement of pointer is controlled by sliding fingertip over it. But the mouse is dragged on the surface to show pointer movement.

SLO-BASED LONG QUESTIONS

Q6. Describe the following classification with their applications in daily life. (2+2+2+2)

- | | |
|--|--|
| <p><i>i. Supercomputer</i></p> <p><i>iii. Minicomputer</i></p> | <p><i>ii. Mainframe computer</i></p> <p><i>iv. Microcomputer</i></p> |
|--|--|

Supercomputers

Supercomputers are the largest, the most expensive and powerful computers. They are used to process complex calculations. They design and control complicated machines such as rockets and fighter planes. They are also used in nuclear research and weather forecasting.

- They are manufactured by *Cray Inc.* and *IBM*.
- *Cray-1* and *Blue Gene* are common examples of supercomputers.

Mainframe computers

Mainframes are larger, more expensive and more powerful computers than minicomputer. They are less powerful than supercomputers. They can execute about *Trillion instructions per second (TIPS)*. They support thousands of users.

- They are used in large organizations, banks, universities and scientific labs.
- The common example is *IBM HP 16500 series*.

Minicomputers

Minicomputers are larger and more expensive than microcomputers. They can support hundreds of users at a time. They are faster than microcomputers. They can execute *Billions of instructions per second (BIPS)*.

- They are commonly used in industrial process control, scientific research and small business applications.
- The example of minicomputer is *IBM HP 3000*.

Microcomputers

Microcomputers are the smallest and very less expensive. Its small size is due to **LSI- Large Scale Integration** and **VLSI- Very Large Scale Integration** technologies. They execute *Millions of instructions per second (MIPS)*. A typical microcomputer consists of a keyboard, mouse, monitor and system unit.

- They are used at home for personal use and in business applications.
- The examples of microcomputers are *IBM ThinkPad* and *Apple series*.

Q2. Describe the following modern uses of computer in today's life with examples. (08)

- **Mobile Computing**

- **Internet of Things**
- **Cloud Computing**

Mobile Computing

It refers to a variety of small portable devices that allow people to access data and information anywhere in a wireless network system.

- These devices have limited functionality as compared to laptops.
- Popular mobile computing devices are *tablet PCs*, *PDA*s and *Smartphones*.

Internet of Things (IoT)

Internet of Things (IoT) is the interconnection between computer network and physical devices to collect and exchange data. These devices are called smart devices and they interact with human through a wireless connection.

- *Smart home* is a popular example of IoT.
- Smart homes are equipped with different types of electronic devices that can be controlled remotely with smart phone or computer through IoT system.

Cloud Computing

Cloud computing means instead of buying and installing your own computer system and software at your workplace, you can get it as a service provided and managed by another company. You can perform your computing tasks through accessing the service over the internet. It does not matter where the hardware and software are located. It is just somewhere in the “*cloud*”. For example, *Gmail* and *Hotmail* provide a webmail service.

Advantages of Cloud Computing

- You don't have to buy and maintain a complex computer system.
- You don't worry about equipment going out of date.
- You don't worry about system security and reliability.

Disadvantages of Cloud Computing

- It requires a reliable high-speed Internet connection functioning the whole time you are working.
- There can be security and privacy risk of having valuable data on the system of someone else in an unknown location.
- We have limited control over the service as a customer.

Q3. What is input device? Explain different input devices in detail. (08)

Input Devices

The process of entering data and instruction in the computer is called *input*. The devices which are used for entering data and instructions are called *input devices*. Various kinds of input devices are used for different kinds of inputs.

The most common input devices are the followings:

- Keyboard
- Pointing devices
- Microphone
- Digital camera
- Scanner
- Magnetic stripe card

Keyboard

Keyboard is the most commonly used primary input device. It is used to enter multiple types of data. Every pressed key generates a signal. A standard keyboard has the following four major types of keys.

- Function keys
- Alphanumeric keys
- Numeric keypad
- Cursor control or Navigation keys

Pointing Devices

Pointing devices are used to control the movement of a pointer on the screen. A **pointer** is a small symbol that appears on the screen in graphical interface. They are used to select text and graphics on the screen.

Some important pointing devices are the following:

- Mouse
- Trackball
- Touchpad
- Joystick
- Touch screen

Mouse

Mouse is the most popular pointing input device. It is used with GUI applications. It has two or three buttons. It has a small ball at the bottom. Optical mouse has a laser beam. The most common mouse events/actions are click, double click, right click, drag and scroll.

Track Ball

It has a ball at upper unit. Ball can be easily moved with fingers. It is easy to use by handicapped person. It has two or three buttons like mouse.

Touch Screen

It is used by fingers for pointing on the screen. It is an I/O device. It is also used as a display unit in computer as well as in other machines. It has sensors beneath the screen. It is used with *mobile, laptops* and *palmtops*.

Light Pen

It is a light-sensitive pen which is used to draw on the computer screen or point to any object. It has a photocell. It is more accurate than fingers to touch on screen.

Touch Pad

A touchpad is a small, flat surface over which the user moves his finger. It has sensors to sense fingers. It is used in laptops. It also has two buttons to perform many actions.

Microphone

It is used to input voice. It is also used for *voice recognition*. A sound card is used to digitize voice. It is used to save or transmit voice.

Digital Camera

It is used to capture image or video. It uses a lens. It also has a screen. It is now categorized as I/O device. It takes input from lens and displays output on the screen.

Scanner

Scanner is an optical input device which is used to scan image or text. It reads the text or images and stores them in digital form. Three types of scanners are the following.

- Handheld scanner
- Flatbed scanner
- Barcode scanner

Handheld Scanner

It can scan anything by moving scanner over the object. Movement of scanner should be at constant speed for best results. Irregular movement can produce distortion. It is easy to use as it can scan any object e.g. box, paper, board, etc.

Flatbed Scanner

It has plane surface to scan any hardcopy. It scans by moving scanner's arm beneath the object. It gives more accurate and sharp results. It is mostly used in *homes* and *offices*

Bar Code Reader

It is used to scan bar codes on products. It is used in supermarkets and retail shops. Bar codes are also called **UPC** (Universal Product Code). Bar codes contains information about products like name, price, quantity, manufacturing date and expiry date.

Magnetic Stripe Cards

It is a card with magnetic stripes. *Stripe* holds information of card holder and his account. It is used by swiping card on machine. They are used for *ATM*, *credit card*, *License*, etc.

Q4. What is pointing input device? Explain different types of pointing devices. (08)

Pointing Devices

Pointing devices are used to control the movement of a pointer on the screen. A **pointer** is a small symbol that appears on the screen in graphical interface. They are used to select text and graphics on the screen.

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Mouse is the most popular pointing input device. It is used with GUI applications. It has two or three buttons. It has a small ball at the bottom. *Optical mouse* has a laser beam. The most common mouse events/actions are click, double click, right click, drag and scroll.

Track Ball

Trackball remains stationary on the surface. It has a ball at upper unit. Ball can be easily moved with fingers. It is easy to use by handicapped person. It has two or three buttons like mouse.

Touch Screen

A touch screen is a computer display screen. It is also used as a display unit in computer as well as in other machines. It is used by fingers for pointing on the screen. It acts like an input as well as output device. It has sensors beneath the screen. The screen is sensitive to pressure. It is used with *mobile, laptops* and *palmtops*.

Light Pen

It is a light-sensitive pen which is used to draw on the computer screen or point to any object. It has a photocell. It gives more accuracy than touch screen. It is normally used in engineering for designing purpose.

Touch Pad

A touchpad is a small, flat surface over which the user moves his finger. It has sensors to sense the movement and position of finger on the pad. It is used in laptops. It also has two buttons to perform many actions like a mouse.

Q5. Why printers are used? Explain different types of printers. (08)

Printers

Printers are the output devices which produce **hard copy**. They can be connected with the computer through parallel ports or USB port.

Printers are categorized on the basis of following characteristics.

- The quality of output
- The ability to print graphics
- The speed of printing

There are *two* major categories of printers.

- Impact printers
- Non-impact printers

Impact Printers

Impact printers print characters and graphics by striking the surface of paper. They do not produce high quality output. They are slow and noisy. They are less expensive. The most common examples are Dot matrix, Daisy wheel and Line printers.

Dot Matrix Printers

Dot matrix printer is the most commonly used impact printer. The print head may have 9 or 24 pins. Pins are arranged in a matrix. It can print shapes or characters in the form of dots.

Chain Printers

It is a type of line printers. The printing speed is measured in *lines per minute*. It contains characters on a moving chain. The chain moves rapidly by two geared pulleys while printing. **IBM 1403** is an example of chain printer.

Non-impact Printers

Non-impact Printers print characters and graphics without striking the paper. They are fast and noiseless. They are still in use. They are more expensive than impact printers. For example, Inkjet and Laser printers.

Inkjet Printers

They are *character printers*. They form characters and all kinds of images. Small drops of inks are sprayed on the paper to print called *cartridge*. Inkjet printers are cheap and silent in operation. They can print in multiple colors. Their printing quality is low and slow in speed than laser printer.

Laser Printers

They are *page printers* so they print one page at a time. Their printing technology is very similar to photocopier. They use *toner* containing the powder. They are very fast and silent in operation. The print quality is very high. They can print graphics in multiple colors.

EXERCISE

Q1. Select the best answer for the following MCQs.

1. ----- of the following is the smallest computer.
 - A. Mainframe
 - B. Minicomputer
 - C. Microcomputer
 - D. Supercomputer
2. How many instructions per second a Minicomputer can execute?
 - A. Thousands of instructions
 - B. Millions of instructions
 - C. Billions of instructions
 - D. Above trillion instructions
3. What type of software MS Word is?
 - A. System software
 - B. Application software
 - C. Utility software
 - D. Language processor
4. ----- device is most suitable for playing games.
 - A. Mouse
 - B. Keyboard
 - C. Joystick
 - D. Light pen
5. Which of the following is an impact printer?
 - A. Dot-matrix printer
 - B. Laser printer
 - C. Inkjet printer
 - D. Plotter
6. ----- software controls the operation of a hardware device.
 - A. Utility software
 - B. Language processor
 - C. Application software
 - D. Device driver
7. Which of the following devices is used to print large size hard copy?
 - A. Plotter
 - B. Inkjet printer
 - C. Laser printer
 - D. Chain printer
8. Which of the following devices converts spoken words into electrical form?
 - A. Touch pad
 - B. Microphone
 - C. Scanner
 - D. Digital camera
9. ----- software converts computer programs to machine language.
 - A. Utility program
 - B. Device driver
 - C. Language processor
 - D. Application software
10. Which of the following is productivity software?
 - A. Spreadsheet software
 - B. Utility software
 - C. Windows 7
 - D. compiler

Answers 01

MCQ	1	2	3	4	5	6	7	8	9	10
Answer	C	C	B	C	A	D	A	B	C	A

Q2. Answer the following questions briefly.

i. Give important characteristics of computers.

Characteristics of Computers

- Computers generate highly accurate results efficiently.
- Computers process data at a very high speed. It is much faster than human beings.
- Computers can store a large amount of data permanently.

ii. Compare microcomputer with mainframe computer.

Mainframe Computers

- Mainframes are larger, more expensive and more powerful computers than minicomputer.
- They are used in large organizations, banks, universities and scientific labs.
- They can execute *Trillion of instructions per second* (TIPS).

Microcomputers

- Microcomputers are the smallest and very less expensive.
- They execute *Millions of instructions per second* (MIPS).
- They are used at home for personal use and in business applications.

iii. Give few application areas of supercomputers.

Supercomputers are widely used in the following areas:

- Weather forecasting
- Nuclear research
- Designing and controlling complicated machines like rockets and fighter planes.

iv. Name few organizations of Pakistan where supercomputers are used.

In Pakistan, supercomputers are used by the following organizations.

- Atomic Energy Research Centre
- National University of Sciences and Technology (NUST)
- Ghulam Ishaq Khan (GIK) institute

v. How barcode system works in a shopping mall?

Barcode System

- *Barcode scanner* is used to scan barcode also called *UPC (Universal Product Code)* of the products.
- These barcodes contain information about the product like name of product, company, manufacturing date and expiry date, etc.
- This information is provided to the computer for further processing like generating cash bills.

vi. Differentiate between computer hardware and software.

Hardware	Software
They are physical components.	They are virtual components.
They can be seen and touched.	They can be seen but not touched.

Hardware	Software
They can be repaired.	They can be installed or reinstalled.
<i>For example</i> , mouse, keyboard and printer.	<i>For example</i> , Windows 10 and MS Office.

vii. Differentiate between system software and application software

System Software	Application Software
It is required by the system.	It is required by the user.
It is for technical people.	It is for common people.
It provides facility to the hardware or software.	It provides facility to the user.
<i>For example</i> , DOS and Windows.	<i>For example</i> , Microsoft Word and Excel.

viii. Define Licensed software

Licensed Software

A *software license* is a legal agreement that specifies the terms of use of a computer program. It defines the rights of the software developer and the user. Software use is allowed to a person who purchase it. Software license deals with the copyright law. *For example*, Microsoft Windows and Microsoft Office.

ix. Differentiate between Shareware and Freeware.

Shareware	Freeware
It is free of charge for a limited time.	It is available for use free of cost for unlimited time.
It is a <i>trial</i> version with limited functionality.	It is a <i>full</i> version with all features.
Some are full versions but stop working after expiry date.	It may have restrictions in terms of use.
<i>For example</i> , antivirus programs.	<i>For example</i> , Skype and Viber.

x. Briefly describe magnetic stripe card.

Magnetic Stripe Card

- It is a card with magnetic stripes.
- Stripe holds information of card holder and his account.
- It is used by swiping card on the machine.
- They are used for ATM, credit card, driving license, etc.

xi. Give any five advantages of using LCD Monitor over CRT monitor

Advantages of LCD

- It provides a sharper image
- It emits less radiation
- It is used in wide range of applications, including computer monitors, televisions and clocks.
- It is usually more compact and lightweight.
- It is portable and less expensive.

xii. Why LED monitors are better choice for LCDs? Give three reasons to support your answer?

LED Monitors

- LED monitors produce bright images.
- They emit less radiation.
- They consume less power.

xiii. Why dot-matrix printers are becoming obsolete?**Dot-Matrix Printers**

- Dot matrix printers are becoming obsolete because they are of low quality.
- They produce noise. They strike on paper and may damage the paper.
- Their print is in dotted form which is difficult to read.
- New technology printers are available at low cost and high quality.

xiv. What are the advantages of using laser printer over dot-matrix printer?**Advantages of Laser Printer**

- Laser printers are fast in speed.
- They produce high quality print.
- Their printing cost is low.
- They are more reliable and durable.

xv. Give any three uses of plotters.**Uses of Plotter**

- They are used in drawing graphs.
- They are used in making maps.
- They are used for plotting machine components.

Q3. Answer the following questions in detail.**i. Describe the types of system software.****System Software**

System software control and coordinate the activities of computer system. They consist of a collection of operative programs. Operative programs are used to control computer hardware and execute application software. Without system software computer would be ineffective and impossible to operate.

There are **four** types of system software.

- Operating system
- Device drivers
- Utility software
- Language processors / Translators

Operating System

It manages the hardware and software resources of a computer system. Resources of computer system are CPU, storage devices and all input / output devices. Some common operating systems are *Windows, Linux, Mac OS* and *android*.

Tasks of Operating System

Operating system performs the following tasks:

- Allocates system resources.
- Manages files by maintaining a proper file and folder system.
- Loads and executes application software.
- Control the operations of all the input / output devices.
- Maintains security.

Device Drivers

Device drivers control the operation of hardware devices. A device attached to computer, will not work without device drivers. The device drivers must be installed before using the device.

Some devices like Mouse, Keyboard, Monitor, etc. are Plug and Play devices. Software of *Plug and Play* devices are preinstalled with windows. Computer system *automatically* recognizes Plug and Play devices, when they are attached.

Utility Software

Utility software provides additional facilities. It carries out tasks which are beyond the capabilities of the operating system. A few important utilities are *disk defragmenter, disk cleaner, file compression utilities and antivirus, etc.*

Language Processors / Translators

The language processors convert assembly language or high-level language into machine language. **Three** types of language processors are the followings.

- Assembler
- Compiler
- Interpreter

Assembler

The assembler is a program that translates assembly language program into machine language. Assembly language consists of symbols called *mnemonics*. Mnemonics must be translated into machine language before execution by the computer.

Compiler

The compiler translates high-level language programs into machine language. It converts the entire program into machine language before execution. It identifies all the errors in the program at once. For example, *C++* and *Visual Basic* use compilers.

Interpreter

The interpreter translates high level language program into machine language but one instruction at a time. It deals with one error at a time. It is slow than compiler. For example, **GW BASIC** is an interpreter.

ii. Why scanners are used? Describe their types.

Scanner

Scanner is an optical input device which is used to scan image or text. It reads the text or images and stores them in digital form.

Three types of scanners are the following.

- Handheld scanner
- Flatbed scanner
- Barcode scanner

Handheld Scanner

It can scan anything by moving scanner over the object. Movement of scanner should be at constant speed for best results. Irregular movement can produce distortion. It is easy to use as it can scan any object e.g. box, paper, board, etc.

Flatbed Scanner

It has plane surface to scan any hardcopy. It scans by moving scanner's arm beneath the object. It gives more accurate and sharp results. It is mostly used in *homes* and *offices*

Bar Code Reader

It is used to scan bar codes on products. It is used in supermarkets and retail shops. Bar codes are also called **UPC** (Universal Product Code). Bar codes contains information about products like name, price, quantity, manufacturing date and expiry date.

iii. What are output devices? Explain its types.

Output Devices

Output devices are used to display or print the output. The output printed on paper, fabric or plastic is called **hard copy** whereas the output display on the screen is called **soft copy**. Hard copy is generated by *printers* and *plotters*. Soft copy is produced by *monitors*.

The most common output devices are the followings.

- Monitors
- Printers
- Plotters
- Speakers

Monitors

A monitor is also called a **VDU** (Video Display Unit). It is an electronic device to display softcopy. It displays the result of user activities. There are different types and sizes of monitors.

The most common types of monitors are the following.

- **Cathode Ray Tube (CRT)** monitors are similar to the standard television sets. They contain a cathode-ray tube. **CRT** is a vacuum tube containing an electron gun and phosphorus coated screen.
- **Liquid Crystal Display (LCD)** monitor is a thin and light weight monitor. It contains a substance called *liquid crystal* between two sheets. It provides a sharp image.
- **LED** monitor is a light weight flat screen display unit. They use *Light Emitting Diodes* (LEDs) as pixels for display. These monitors produce bright images. They emit less radiations.

Printers

Printers are the output devices which produce *hard copy*. They can be connected with the computer through parallel ports or USB port.

There are two major categories of printers.

- Impact printers
- Non-impact printers

Impact printers

Impact printers print characters and graphics by striking the surface of paper. They do not produce high quality output. They are slow and noisy. They are less expensive. For example, *Dot matrix, Daisy wheel and Line printers*.

- **Dot matrix printer** is the most commonly used impact printer. The print head may have 9 or 24 pins. Pins are arranged in a matrix. It can print shapes or characters in the form of dots.
- **Chain printer** is a type of line printers. The printing speed is measured in *lines per minute*. It contains characters on a moving chain. Non-impact Printers

Non-Impact Printers

Non-impact Printers print characters and graphics without striking the paper. They are fast and noiseless. They are still in use. They are more expensive than impact printers. For example, *Inkjet and Laser printers*.

- **Inkjet printers** are *character printers*. They form characters and all kinds of images. Small drops of inks are sprayed on the paper to print called *cartridge*. Inkjet printers are cheap and silent in operation.
- **Laser printers** are page printers so they print one page at a time. Their printing technology is very similar to photocopier. They use *toner* containing the powder. They are very fast and silent in operation.

Plotters

Plotters are the output devices which produce high quality large size hardcopy. They are more expensive than printers. They are used for drawing graphs, maps, civil engineering drawings & machine parts, producing large size posters, etc. For example, *flatbed plotter and drum plotter*.

- **Flatbed plotter** plots on paper which is spread and fixed over a rectangular flatbed. Pen holding mechanism moves on the surface to draw images.
- **Drum plotter** uses a drum which rotates to move the paper to the other side. The drawing pens are mounted on the drum. The pens move left and right as the drum rotates to draw images.

Speakers

Speakers are the most common audio output devices. They are attached to the sound card on the motherboard. Speakers produce softcopy output in the form of voice. They are available in different shapes and sizes.

iv. Why plotters are used? Briefly explain their types.

Plotters

Plotters are the output devices which produce high quality large size hardcopy. They are more expensive than printers. They are used for drawing graphs, maps, civil engineering drawings & machine parts, producing large size posters, etc.

There are two types of plotters.

- Flatbed Plotter
- Drum Plotter

Flatbed Plotter

Flatbed plotter plots on paper which is spread and fixed over a rectangular flatbed. Drawing pens of different colors are mounted (fitted) in the pen holding mechanism. Pen holding mechanism moves on the surface to draw images.

Drum Plotter

Drum Plotter uses a drum which rotates to move the paper to the other side. The drawing pens are mounted on the drum. The pens move left and right as the drum rotates to draw images. They are used to print large size Pana flexes.

v. What is non-impact printer? Describe its types

Non-impact Printers

Non-impact Printers print characters and graphics without striking the paper. They are fast and noiseless. They are still in use. They are more expensive than impact printers. For example, Inkjet and Laser printers.

Inkjet Printers

Inkjet printers are also called *character printers*. They form characters and all kinds of images. Small drops of inks are sprayed on the paper to print. The ink is contained in the *cartridge*. They are cheap and silent in operation. They can print in multiple colors. Their printing quality is low and slow in speed than laser printer.

Laser Printers

Laser printers are also called *page printers* because they print one page at a time. Their printing technology is very similar to photocopier. They use *toner* containing the powder. They are very fast and silent in operation. The print quality is very high. They can print graphics in multiple colors.

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