

## 2. COMPONENTS OF THE COMPUTER SYSTEM

### 1). What is Hardware , Software and Humanware?

- 1). Hardware is the tangible and visible parts of a computer.  
Eg. Processor, Mother board etc
- 2). Software is a set of programs that help us to use the computer system or electronic devices efficiently.  
Eg. Operating System, Antivirus etc.
- 3). Humanware/ Liveware: It refers to the human who use the computer.

### 2). What is CPU? What are its Components?

CPU is responsible for all computing and decision making operations and coordinates the working of a computer system. It contains

- a). **Arithmetic and Logic Unit (ALU):** Do all the arithmetic and comparison operations.
- b). **Control Unit(CU):** generate signals to control and coordinate various components of the computer.

### 3). What is a Motherboard? What are its components?

Motherboard is a Printed Circuit Board(PCB) to which all the major components of a computer is connected.

In a mother board there are Different types of ports like USB , PS/2 , HDMI etc.. , CPU socket, slots like memory slot, PCI slot, CMOS Battery, power connections etc.

### 4). What are ports? What are different types of ports used in a computer system?

Ports are the interconnection through which all the external devices are communicate with computer mother board.

The different types of ports are,

- a). **Parallel ports:** Parallel ports can transmit several bits of data simultaneously. It is faster than serial port.
- b). **Serial ports:** A serial port transmits data one bit at a time. It is very slow.
- c). **PS/2 Ports:** Personal System/2 (PS/2) ports are special ports invented by IBM (International Business Machines) for connecting the keyboard and mouse
- d). **USB Ports:** USB (Universal Serial Bus) is a connection that provides high speed data communication between devices.
- e). **LAN Ports:** Local Area Network port(Ethernet port) is a port connection that allows a computer to connect to a network using a wired connection. RJ45 is a standard type of connector used for connecting cables through LAN ports.
- f). **VGA Ports:** Video Graphics Array (VGA) port by IBM is used to connect a monitor or a projector to a computer
- g). **Audio Ports:** Audio ports are used to connect audio devices like speakers, microphone, etc.).
- h). **HDMI Ports:** High Definition Multimedia Interface (HDMI) is a type of digital connection capable of transmitting high-definition video and multi channel audio over a single cable

### 5). What are peripherals?

Peripherals are devices that are attached to the computer system to enhance its capabilities. Eg. Printer, scanner etc

### 6). What is Computer Memory? What are different types of memory?

Memory is a place where we can store data, instructions and results temporarily or permanently.

Memory can be classified into two: **primary memory** and **secondary memory**.

### 7). What is Primary Memory?

**Primary memory** in a computer holds data, intermediate results and results of ongoing jobs temporarily.

Eg. RAM. (**Random Access Memory**): It refers to the main memory that microprocessor can read from and write to. Data can be stored and retrieved at random from anywhere within the RAM.

### 8). What are ROMs?

ROM is a permanent memory that can perform only read operations and its contents cannot be easily altered. ROM is non-volatile; the contents are retained even after the power is switched off.

Eg. Basic Input Output System (BIOS).

Some modified types of ROM are,

a). **PROM** - Programmable ROM which can be programmed only once.

b). **EPROM** - Erasable Programmable ROM that can be erased using ultra violet radiation and can be programmed using special electronic circuits.

c). **EEPROM** - Electrically Erasable Programmable ROM which can be erased and rewritten electrically. Eg. Pen Drive

### 9). Compare RAM and ROM.

RAM	ROM
It is faster than ROM	It is a slower memory
It stores the operating system, application programs and data when the	It stores the program required to boot the computer initially
It allows reading and writing.	Usually allows reading only.
It is volatile, i.e. its contents are lost when the device is powered off.	It is non-volatile

### 10). What is Cache Memory?

Cache memory is a small and fast memory between the processor and RAM. It helps to improve the speed and performance of the computer system.

### 11). What is Secondary or Auxiliary memory?

Secondary memory is permanent memory. Secondary memory is much larger in size than RAM, but is slower. It stores programs and data but the processor cannot access them directly.

Eg. Hard Disk, CD , ROMs etc.

### 12). What are the different categories of storage?

Different categories of storage devices are magnetic, optical and semiconductor memory.

### **i. Magnetic storage devices**

Magnetic storage devices use plastic tape or metal/plastic disks coated with Magnetic materials. Data is recorded magnetically in these devices.

Eg. 1. Floppy Disk, 2. Hard Disk, 3. Magnetic Tape

**a). Floppy Disk:** It is made up of plastic coated with magnetic material. Its capacity is 1.44 MB.

A floppy drive is used to read the data from a floppy disk. Data will lose when it kept inside a magnetic field or other chemicals, because it coated with magnetic substances.

**b). Magnetic Tape:** It can store huge volume of data and cheap. Data is stored in thin tape coated with magnetic material. It is a sequential access medium.

**c). Hard Disk:** It contains a group of metallic disks, coated with magnetic material in a dust proof case. Each plate has read write head. It has huge capacity from 10 GB to 4 or more TB. The recordable surface of a disk is divided into number or invisible concentric circles called Tracks. Each track again divided into pie shaped segments called sectors.

### **ii. Optical storage devices**

Optical disk is a data storage medium which uses low-powered laser beam to read from and write data into it. It consists of an aluminum foil sandwiched between two circular plastic disks. Data is written on a single continuous spiral in the form of pits and lands.

They are classified into three,

**a). Compact Disk (CD):** It is made up of a layer of aluminum on a plastic plate. Its capacity is 700 MB. It may be CDROM or WORM (write ones read many) or CD R/W. To read and write red beam of laser light is used.

**b). Digital Versatile Disc (DVD):** It is faster and has more storage capacity than CD. Its capacity is from 4.7 GB to 15.9GB

**c) Blue Ray DVD:** Used to store High Definition videos and huge amount of data storage. It uses blue-violet LASER beams that allows data is packed more tightly.

### **iii. Semiconductor storage (Flash memory)**

Flash drives use EEPROM chips for data storage. They do not contain any moving parts. Flash memory is faster and durable when compared to other types of secondary memory.

#### **a). USB flash drive**

A flash drive is a small external storage device, which consists of flash memory typically the size of a human thumb. USB flash drives are portable and rewritable.

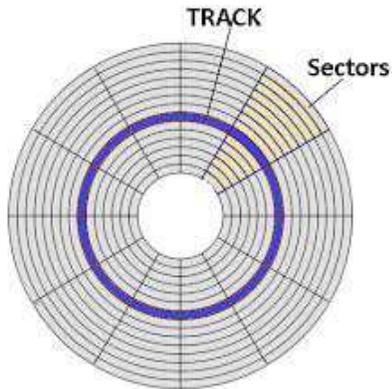
#### **b). Flash memory cards**

Flash memory card is another type of flash memory. They are flat and small in size.

### **13). Explain the Structure of Hard Disc , Floppy Disk/CD/DVD/Blue ray DVD.**

In Hard disk the disk is made of metal and is coated with magnetic material. Data is stored in surface of the disc which is structured into circular tracks and wedge shaped sectors. ( Formatting is the activity of creating tracks and sectors on a disk.)

In CD/DVD/Blue Ray DVD an aluminum foil is glued with plastic disc. Data is stored in tracks and sectors made on aluminum foil by LASER beam as Pits and Lands.



**14). Give examples of magnetic, Semiconductor and Optical Memory?**

**Magnetic Memory:** HDD, Magnetic Tape , Floppy Disk

**Optical Memory** : CD, DVD, Blue Ray DVD

**Semiconductor Memory:** RAM, ROM etc

**15). What are CPU registers?**

CPU Registers are used to retrieve and store data at an extreme speed when manipulations are done by the CPU on a temporary basis. Some Important CPU Registers are,

1. **MAR** (Memory Address Register):- To store the address of the memory location where data is to be stored/retrieved.
2. **MBR** (Memory Buffer Register) :- It holds the data, either to be written to or read from the memory by the processor.
3. **PC** (Program Control Register) :- It holds the address of the next instruction to be executed by the processor.
4. **I R**(Instruction Register) :- The instructions to be executed by the processor are stored in the instruction register.
5. **Accumulator** :- It is a part of ALU which is used to store data to perform ALU operations and store the result.

**16). What is the storage capacity of a single layer DVD ?**

4.7 GB

**17). What is Sequential and Random Access Memory ?**

**1. Sequential Access:** Here the data accessed in a sequential manner i.e. one after another

Eg: Magnetic Tape.

**2. Random Access:** Here the data accessed from any location randomly. It is classified in to two:

Eg. Magnetic Disk, Optical Disk

### **18). What are different types of input devices used in a computer system?**

An input device is used to feed data into a computer or provide communication between user and the system.

**a). Keyboard:** It is used to inputting alphabets, numbers and other characters. etc. characters. Keyboard detects the key pressed and generates the corresponding ASCII code which can be recognized by the computer. Usually it consists of 101 to 105 keys It has a keyboard layout called the QWERTY design. QWERTY gets its name from the first six letters across in the upper left- hand corner of the keyboard.

**b). Mouse:** It is a pointing device to point and select objects from the screen and also draws pictures. There are various types of mouses like

1. Serial and parallel mouse, 2. Optical mouse 3. Wireless Mouse

**c.)Optical Character Reader (OCR):**An OCR is a device that can read characters printed with a predefined font. Characters scanned with optical scanner. Scanned image converted to ASCII code and compare with original. It is faster input method with fewer errors. But only limited characters are used. For proper reading high quality printing is needed.

**d). Optical Mark Reader (OMR):** They scans and detect marks made by a dark pencil or pen on special pre printed form. The OMR scan the document and transform it in to electric pulses. They Used in,

1. Objective type exam , 2. Surveys.

Advantages: Reliable, Speed, Accurate

**e). Magnetic Ink Character Reader (MICR):**It can recognize human readable characters printed on documents with magnetic ink and special font. They mostly used in bank cheques to print cheque number. So speedily manipulate the cheques with high accuracy.

**f). Bar Code Reader/Quick response Reader:** It converts a pattern of printed bars (a sequence of black and white lines of different widths) in to a number. A bar code reader emits light to the code and it reflects back to the device. They used to identify products, books, certificates etc.

A QR code is similar to barcodes. Barcodes are single dimensional whereas QR codes are two dimensional as

**f). Scanner:** They are used to scan and digitalize images, documents etc. Here a light source moves to and fro to read the document. The detectors convert the document to electric pulse.

**g). Digital Camera:** A digital camera allows to take pictures and videos and convert them into digital format.

Pictures or videos taken using a digital camera are stored inside its memory and can be transferred to a computer by connecting the camera to it. The quality of the picture is determined by the number of pixels in each picture

**h). Web Camera:** Web camera is a compact and less expensive version of a digital camera. It is used in computers for video calling, video chatting, etc. It does not have an internal memory.

**i). Microphone:** They help us to input sound to the computer. It translates the vibration in the air in to electric pulse. The sound can store and reuse for voice recognition applications.

**j). Joystick:** It is a pointing device used to select and move objects on the screen. They are mainly used to play games , controlling training stimulations and robots

**k). Track Ball:** It is also a pointing device like mouse. It has a ball, can rotate to control the cursor movements. They are especially used in laptops.

**l). Light Pen:** Light pen is a pointing device. To draw pictures, design objects and also put digital signatures directly on the screen. Here the photocell inside the light pen responses the picture element on the screen. It is used by artist, designers etc.

**m). Touch Screen:** It enable the user to input data by touching the screen. So key board, mouse etc can be avoided and it made user friendly interface.

**n). Touch Pad:** It is an input device that allows the user to operate by simply touching on the display screen. Some computers, tablets, smart phones, etc. have touch sensitive display screens

**o). Graphic Tablet:** A graphics tablet consists of an electronic writing area and a special pressure sensitive "pen" that works with it. It allows artists to create graphical images

**p). Biometric Sensor:** A biometric sensor is a device that identifies unique human physical features like fingerprints, retina, iris patterns, etc. with high accuracy.

**q). Smart Card Reader:** Smart card readers are used to access data in a smart card. It can be contact type or contactless.

### **19). What are the different types of output devices used In a computer system?**

Output devices are devices that produces hard copy(permanent copy on paper like medium) or soft copy outputs (electronic and are available on the screen in a digital form). Different types of output devices are,

**a). Visual Display Unit (VDU) :**It is a standard and soft copy output device of the computer.

They are classified into two,

1. **Monochrome Monitors and Color Monitors** with CRT (Cathode Ray Tube)

**Disadvantages of CRT Monitors:** They are heavy, Bulky in size, High power consuming, Not portable and Make eyestrain.

2. **Flat panel Monitors** like LCD (Liquid Crystal Display) and LED Monitor

**i) LCD (Liquid Crystal Display):** They are made up of special kind of liquid crystals, placed between two plates. When electricity passed through it, crystal liquid become solid and blocks the light.

Advantages of LCD Monitors: They are weightless, Slim in size, Low power consuming, Portable and not make eye strain.

**ii).LED(Light Emitting Diode) Screen:** It is also like LCD, but light source is an array of LEDs. It will create more clear pictures than LCD and power consumption is less.

**iii).Plasma Monitors :** Plasma monitors provide high resolution but are expensive.

**Organic Light Emitting Diode (OLED) Monitors :** OLED screens are thinner and lighter than LCDs and LEDs. They can produce better quality images and have a better viewing angle. OLEDs consume less power, but are very expensive.

**LCD Projector :** An LCD projector is a type of video projector for displaying video, images or computer data on a large screen or other flat surface

## **b). Printers:**

Printers are used print the data on a paper. Printed output is the most useful and convenient form of information for users. So it is a hard copy device.

They are classified in to two: 1. Impact Printers, 2. Non Impact Printers.

**a). Impact Printers:** In impact printers there is physical contact between with print head and paper. It produces noise. Slow printing speed. It produces poor quality prints.

They are again classified into two,

1. Line printers, 2. Character Printers

**1. Line printers:** They print entire line of text at a time. So it is used to print large volume of data.

Examples: 1. Drum printer, 2. Chain Printer

**2. Character Printers:** They are slow and print a single character at a time.

### **i) Dot Matrix Printer**

Characters are formed by the impact of pin sets. When print head moves pins are strike on the paper. They versatile (can print both text and graphics), Print cost is low but low speed, low quality and noisy. But we can change the font settings.

## ii). Non Impact Printers

There is no physical contact between print head and paper. Printing speed is high. It produces high quality with colour printing. They do not produce noise.

Example: 1. Inkjet Printers, 2. Laser Printers

### 1. Inkjet Printers:

Inkjet printers form the image on the page by spraying tiny droplets of ink from the print head. There is no physical contact between print head and paper. Printing speed is high. It gives high quality with colour printing and it does not produce noise. But the cost of ink cartridges makes it a costly in the long run.

**2. Laser Printers:** Here carbon powder (toner) acts as carbon ribbon. The image to be printed is transferred to a drum using a laser beam. The toner powder sticks onto the portions traced on the drum by the laser beam. It is transferred to a paper by rolling the paper over the drum.

Printing speed is high. It gives high quality with colour printing and it does not produce noise.

**3. Thermal Printers:** Thermal printing produces a printed image by selectively heating heat-sensitive thermal paper when it passes over the thermal print head. The coating turns black in the areas where it is heated, producing an image.

**4. 3D Printers :** A 3D printer is a new generation output device used to print 3D objects. It can produce different kinds of objects in different materials, using the same printer.

**c). Plotters:** They are output devices used to produce large drawings or images. Used to print building plans, machine designing, blue prints etc. It has arms with coloured pens. Useful in CAD (Computer Aided Design)

They are two types: 1) Drum plotter, 2) Flat bed plotter

### d). Audio output device

Speakers are the output device that produces sound. It is connected to the computer through audio ports.

## 20). What is e-waste? What is its impact and how can Manage it?

e-Waste refers to electronic products nearing the end of their "useful life"

- . Electronic waste may be defined as discarded computers, office electronic equipment, entertainment devices, mobile phones, television sets and refrigerators.

e-Waste contains some toxic substances such as mercury, lead, cadmium, brominated flame retardants, etc. CRTs have a relatively high concentration of lead and phosphors. The toxic materials can cause cancer, reproductive disorders and many other health problems, if not properly managed.

e-Waste should never be disposed with garbage and other household wastes. The following methods can be adopted for disposal of e-waste.

- a). **Reuse:** It refers to second-hand use or usage after the equipment has been upgraded or modified.
- b). **Recycling of e-Waste:** Recycling is the process of making or manufacturing new products from a product that has originally served its purpose.
- c). **Refuse :** Use alternatives if there is or buy only if it is necessary.
- d). **Incineration:** It is a controlled and complete combustion process in which the waste is burned in specially designed incinerators at a high temperature
- e). **Land filling:** It is one of the most widely used, but not recommended methods for disposal of e-Waste.

### 21). What is green Computing? How to make computers green?

Green computing is the designing, manufacturing, using and disposing of computers and associated components efficiently and effectively with minimal or no impact on the environment.

To make computer green,

- a). **Green design:** Designing energy-efficient and eco-friendly computers, servers, printers, projectors and other digital devices.
- b). **Green manufacturing:** Minimising waste during the manufacturing of computers and other components.
- c). **Green use:** Minimising the electricity consumption of computers and peripheral devices and using them in an eco-friendly manner. Minimise printing and maximize the use of soft copy.
- d). **Green disposal:** Reconstructing or recycling unwanted electronic equipment.

### 22). What is software? What are different types softwares?

Software is a set of instructions to perform a desired and useful work done by the help of computers. They are classified in to two. They are 1) System Software 2) Application Software.

### 23). What is system software?

It is a collection of programs that directly control the computer's internal operations and also that help ordinary users to make use of computer effectively and efficiently. It is also known as system package.

Eg:- Operating System, Language Processors

### 24). What is an operating system?

It acts as an interface between the user and the hardware. It is a set of programs that control, co-ordinate the operations of a computer and help to make efficient use of resources ie. Software and hardware.. It has the following functions.

Process management, Memory management, File management, Security and Command interpretation.

Example: MS Windows XP, Vista, 7, Linux, DOS.

## 25). What are utilities?

Utility software is a set of programs which help users in system maintenance tasks and in performing tasks of routine nature.

Some egs. are,

**a). Compression tools:** Large files can be compressed so that they take less storage area. These compressed files can be decompressed into its original form when needed.

Eg. Winzip, 7zip etc.

**b). Disk defragmenter:** Disk defragmenter is a program that rearranges files on a computer hard disk.

**c). Backup software:** Backup means duplicating the disk information as a protection from loss.

**d). Antivirus software:** Antivirus software is a utility program that scans the computer system for viruses and removes them.

## 26). What is machine language, Assembly language, High Level Languages (HLL): ?

**Machine language** :-The language, which uses binary digits, is called machine language. Writing a program in machine language is very difficult.

**Assembly language:** Assembly language is an intermediate-level programming language. Assembly languages use mnemonics. Mnemonic is a symbolic name given to an operation. eg ADD, SUB

**High Level Languages (HLL):** These are like English languages and are simpler to understand than the assembly language or machine language. Eg. C++, VB etc.

## 27). What is Language Processers?

Language processors used to translate the assembly or high level language programs or instructions into equivalent machine language instructions. They are classified into three. They are 1) Assembler 2) Compiler and 3) Interpreter.

**Assembler:** It converts assembly language codes into Machine language codes.

**Compiler:** It translates all lines of high level language program at a time into its equivalent machine code. The language like C++ .

**Interpreter:** It translates high level language program in line by line into its equivalent machine code. So it needs less memory than compiler. The language like BASIC uses interpreter.

## 28). What is Application Software?

Software developed for specific application is called application software .

Eg. GIMP, Payroll System, Airline Reservation System, Tally, etc.

**a. General purpose software packages:** They are widely used soft wares

**i). Word processing software:** Word Processing software is designed for creating and modifying documents. Eg. MS Word, Open Office Writer

**ii). Spreadsheet software:** Spreadsheet software allows users to perform calculations using spreadsheets. eg. MS Excel, Open Office Calc

**iii). Presentation software:** The software that is used to display information in the form of a slide show. eg. MS power point, Open Office Impress etc.

iv). Multimedia software can process information in a number of media formats like text, graphics, audio, video, etc. eg. VLC Player, Adobe Flash, Real Player, Media Player, etc.

**b. Specific purpose software (Customised Software) :** They are developed to solve an individual or organization's need. **Eg:** Pay roll, Air line reservation, sales and inventory control, Hospital management, Library management, Supermarket management, banking, insurance, accounting etc.

**c. Utilities:** They are used to assist the computer for house holding activities like back upping files, scanning viruses etc. they are Text editor, Backup Utility, Compression Utility(Zipping), Disk Defragmenter, Antivirus software etc.

**29). DBMS stands for \_\_\_\_\_.**

Data Base Management System

**30). What is the difference between free software and Proprietary software ?**

**Proprietary software** is a computer program is property of the developer/publisher and can not copy , change or distribute without permission. Eg. Microsoft Windows, Mac OS, MS Office etc.

**Free and open source software** gives the user the freedom to use, copy, distribute, examine, change and improve the software.

The Free Software Foundation (FSF) defines the four freedoms for free and open source software:

**Freedom 0** - The freedom to run program for any purpose.

**Freedom 1** - The freedom to study how the program works and adapt it to your needs.

**Freedom 2** - The freedom to distribute copies of the software.

**Freedom 3** - The freedom to improve the program and release your improvements.

**31). What is the difference between Freeware and Shareware?**

<b>Freeware</b>	<b>Shareware</b>
software which is made available for use free of charge for an unlimited period.	commercial software that is distributed on a trial basis. Chance to try before purchasing
All the features are free.	All features are not available.
Freeware programs can be distributed free of cost.	Shareware may or may not be distributed freely.

**Previous Questions:**

1. Write the full form of HDMI (1)
2. The process of converting source code into object code is called ..... (1)
3. Write an example of an operating system that is a free and open source software. (1)
4. .. ..... is a software used for removing worms and trojans (1)
5. "Central Processing Unit(CPU) is the brain of the computer".What is the role of Control Unit(CU) in the CPU? (1)
6. USB stands for .. ... (1)
7. Differentiate between a compiler and an interpreter. (1)
8. a). " e-Waste is one of the major problems which we are facing all over the world".  
Justify the statement. (1)
9. Which one of the following CPU register hold the address of the next instruction to be executed by the processor. (1)
  - a). Accumulator
  - b). Instruction Register(IR)
  - c). Memory address register
  - d). program Counter(PC)
10. Which one of the following is used to connect a projector to a computer? (1)
  - a) USB port
  - b) PS/2 port
  - c) Parallel port
  - d) VGA port
11. Compare RAM and ROM (2)
12. Name any four parts on the mother board (2)
13. Consider that NSS volunteers of your school have taken up a campaign to educate your friends in other schools to reduce e-Waste. Write four captions(methods) for the campaign through which students can reduce the volume of e-waste produced. (2)
  - b). Explain e-Waste disposal methods. (2)
  - c). Define the term, green - computing. How can you implement green -computing? (2)
14. Arrange the following memory storage devices on the base of their speed in ascending order.

- a). Hard Disk      b). Cache      c). RAM      d). Registers (2)
15. In an office, various kinds of reports and account statements are to be prepared. Name the two types of software needed and explain how they satisfy the requirement. (2)
16. Define the term Green-computing. How can you implement Green – computing? (2)
17. Mr. Rajmohan wants to buy a computer. He is an engineer by profession. He wants a device to Draw which can be used to 'draw directly on the screen.
- a) Suggest him an input device. b) Suggest him any four practices of green computing. (3)
18. List and explain the different methods for disposing electronic waste . (3)
19. Differentiate or define the terms software and hardware in a computer system. Give one example for each. (3)
20. Almost all desktop computers have keyboard and mouse as their standard input devices. List and explain any other five input devices used to enter data into a computer. (5)
21. What do you mean by utility software? List any four types of utility softwares with their use (5)
22. Explain any five commonly used secondary or (auxilliary) memory devices. (5)
23. Compare Dot matrix printer, Ink jet printer, Laser printer and Thermal printer On the basis of their working speed, quality of printing, and expense for printing. (5)
24. What are the types of memories used in computer. (6)