FY-CHAPTER - 2 COMPONENTS OF THE COMPUTER SYSTEM

1.Computer Hardware:

Physical devices enable to input, output, storage, processing, communication, and more

1.1 Processors : A processor is the circuit that performs all the calculations, decision making and coordinating other operations in a computer.

Register: Registers are temporary storage memory that are being used immediately by the CPU.

Register:	Use
Accumulator	It is the part of ALU where the results of arithmetic and logical operations are stored.
Memory Address Register (MAR)	It stores the address of the memory location of the data to be processed.
Memory Buffer Register (MBR) or Memory Data Register	Data is temporarily stored in MBR for quick access during processing.
Instruction Register (IR)	IR stores the instructions to be executed
Program Counter (PC)	Stores the address of the next instruction to be processed.

1.2 Motherboard : This is the printed circuit board (PCB)

► Motherboard Port

Port	Use
USB Port(Universal Serial Bus)	Enables high-speed data communication
Audio Port	To connect audio devices like speakers and microphone
VGA Port (Video Graphics Array)	Connects the monitor or projector to the computer.
LAN Port / Ethernet port / Network port	To connect the computer to a network using a wired connection (RJ45).
PS/2 Port (Personal System/2)	This Port was invented by IBM to connect mouse and keyboard. Slower than USB.
HDMI (High Definition Multimedia Interface) Port	Enables transmission of high-quality video and audio over a single cable

**Memory measurement units

Binary Digit = 1 Bit	1 Nibble = 4 Bits	1 Byte = 8 Bits	1 KB (Kilo Byte) = 1024 Bytes
1 MB (Mega Byte) = 1024	1 GB (Giga Byte) =	1 TB (Tera Byte) =	1 PB (Peta Byte) = 1024
KB	1024 MB	1024 GB	TB

1.3 Memory : Data, instructions and results are temporarily or permanently stored.

<u>2 types of memories</u> : Primary memory, Secondary Memory

1.3.1. Primary memory:

It is the component of the computer that temporarily stores data, instructions, and programs while the computer is running. Able to send and receive data at high speed. **Primary memories are of 3 types:**

1.3.1.A RAM (Random access memory)	1.3.1.B ROM (Read only memory)
It stores the operating system, application programs and data when the computer is functioning.	Stores the program needed to boot the computer.
Temporary storage memory	Permanent storage
It is faster than ROM	It is slower than RAM
Volatile memory	Non-volatile memory (data remains stored even if it is powered-off)

1.3.1.C Cache memory : It is a small and fast memory between the processor and RAM.

1.3.2. Secondary Memory (Auxiliary Memory) :

It is non-volatile memory which has higher storage capacity than primary memory but slower speed and can store data/information permanently.

3 Types of Secondary Memory :

- ► Magnetic Storage Device : Data is stored over plastic tape or metal/plastic disks that are coated with magnetic material .
- **Example :** 1. *Magnetic Tape :* Plastic tape coated with magnetic material 2. *Hard disk:* Metal disks coated with magnetic material
- ► Optical Storage Device: It uses low- powered laser beam to read from and write data into it .It consists of an aluminium foil between two circular plastic disks.
 - **Example :1.** Compact Disc (CD): Capable of storing up to 700 MB of data.

2. Digital Versatile Disc (DVD) : Capable of storing up to 4.37 GB to 15.9 GB of data

3. Blu-ray DVD : Enable to recording ,rewriting and playback of High Definition

(HD) video as well as storing huge amounts of data.

Semiconductor Storage (Flash Memory): It's a low-cost portable non-volatile storage chip that can electronically erase data and Reprogram it.

Example: 1. USB Flash Drive (Pen Drive): A portable storage device that is the size of a human finger. 2. Flash Memory Cards : Commonly seen in phones and cameras.

<u>1.4 Input Device :</u> A device used to insert data and instructions into a computer.

Input Device	Explanation		
Keyboard	Computer can enter data including characters and numbers		
Mouse	A pointing device used to move to any location on the display screen		
Microphone	Used for recording sound		
Touch screen	Input is enabled by touching the electronic visual display		
Scanner	Capture images or text data in print form can be stored in the computer		
Light pen	A light-sensitive computer input device		

www.teachbook.in | 2

<u>1.5 Output Device</u>: A device that displays/prints output from a computer.

Output device		Explanation		
1.5.1 Visual Display	v Unit (VDU)			
Cathode Ray Tube (CRT) monitor	A special vacuum tu phosphorescent sur	A special vacuum tube that produces images when an electron beam strikes a phosphorescent surface		
	Thinner, lighter, consumes less power and emits less heat compared to C monitors.			
	Liquid crystal display (LCD) monitors	A liquid crystal is contained between two plastic plates. When electric current passes through it, images appear.		
Flat panel monitor	Light Emitting Diode (LED) Monitors	An LED is used directly behind the liquid crystal display (LCD) to illuminate the image. The advantages are better quality, clarity and power saving.		
	Plasma monitors	An ionized gas is contained between two glass plates. As a voltage pulse passes through a glass plate with electrodes on it, the gas glows in different colors.		
	Organic Light Emitting Diode (OLED) monitors	An OLED panel is made up of millions of tiny LEDs. Light weight, produce better quality images, better viewing angles, less power consumption, and are very expensive.		
1.5.2 Printer				
Dot Matrix Printer (DMP)	Image/text is formed on the paper as a result of the pins striking the inked ribbon.			
Inkjet printer	Liquid ink is sprayed onto the paper			
Laser printer	The material to be printed is delivered to the drum using a laser beam. The ink powder is sprayed on the drum and heated and placed on the paper.			
Thermal printer	image is printed on thermal paper by means of heat			
1.5.3 Plotter : A dev	ice used to make h	ard copies of graphs and designs		
Drum Plotter/ Roller Plotter	The paper is attached to the surface of the rotating drum. Graphs are drawn using the drawing system.			
Flatbed Plotter (Table Plotter)	The drawing system moves over the paper and draws the graph on the paper			
1.5.4. Three Dimensional (3D) Printer :Used to print 3D objects such as plastic toys and metal machine parts.				
1.5.5 Audio Output Device: Speakers are output devices that produce sound				

2. E-Waste : E-waste is discarded electrical or electronic equipment.

***** <u>E-waste disposal methods</u>		
Reuse	Use Second hand or upgraded or modified devices	
Incineration	Waste is burned at high temperatures in incinerators	
Recycling	It is the process of making new products from e-waste.	
Land filling	The soil is dug up & e-waste buried in it then fill with soil	

2.1. Role of students in e-waste disposal

- Avoid buying unnecessary electronic devices.
- When equipment breaks, try to repair it instead of buying a new one.
- Try to recycle the equipment
- Buy a rechargeable device instead of disposable batteries

3. Green Computing / Green IT :

It is the study and use of technology that does not harm nature. **3.1.4 Methods Used to Promote Green Computing** Green Design, Green Manufacturing, Green Use, Green Disposal

4.Software: Software is a set of programs that a computer needs to function.

Two types of software :

4.1. System Software: It is a set of programs that is designed to control the functions of a Computer.

Three Types of System Software Components:

4.1.1. Operating System (OS): Operating system is the system software that runs as the interface between the user and the hardware

4 main Functions of operating system

- Process Management : It is a procedure to manage many processes running simultaneously in the operating system.
- Memory management : Manage operations between main memory and disk during process execution
- File management : Manipulating files in a computer system, which includes creating, modifying, and deleting files.
- **Device management** : Controls the hardware devices attached to the computer.

*! Example for OS : DOS, Windows, Unix, Linux, Mac iOS, Ubuntu, Android OS

4.1.2. Language Processors : Converts high-level & assembly languages into machine language that computers can understand.

Different types of language processors

- > Assembler : Converts assembly language code into machine language.
- Interpreter : A line-by-line conversion of a program in a high-level language to machine language.
- Compiler : A program that converts instructions into a machine-code or lower-level so that they can be read and executed by a computer.
- **4.1.3. Utility software :**These are programs that help with system maintenance tasks. **Example :** Compression tools, Disk defragmenter, Backup software, Antivirus software

4.2. Application software: These are softwares that are made for a specific purpose.

- General purpose software packages:
 Example: Word processing,Spreadsheet,Presentation,Database software,Multimedia software.
- Special purpose software: Example: Payroll System, Inventory Management System, Human Resource Management System.

5. Free & Open Source Software

Users may use, copy, distribute, test & Gives freedom to change and improve.

******What are the freedoms given to the user?

Freedom 0 : Freedom to run the program for any purpose

Freedom 1: Freedom to learn how the program works and to make changes.

Freedom 2 : Freedom to distribute copies of the software.

Freedom 3 : Freedom to improve the program and provide your improvements to the Public.

Example: GNU/Linux, GIMP, Mozilla Firefox, OpenOffice.org

******6. Freeware & Shareware

Freeware	Shareware	
It can be downloaded from the Internet and used for free.	Give users a chance to try the software before buying it.	
All the features of the software are available for free	Not all features are available but all features are available for purchase	
Software can be distributed for free	It may or may not be distributed freely	

7. Humanware/ Liveware : Refers to the humans who use the computer.
 Different humanware : System administrator, system manager, system analyst, database administrator, computer engineer, computer programmer, computer operator.

Previous Repeated Questions (2018 - 2023)

- 1. Write the functions of the following registers? Accumulator, instruction register, program counter
- 2. Ports on the motherboard are used to connect external devices. Explain about Any 3 types of ports.
- 3. Name any four hardware ports used in PCs.
- 4. HDMI stands for
- 5. 1 KB = Bytes? (a) 1024 (b) 1000 (c) 1014 (d) 1054
- 6. Mention any two uses of primary memory.
- 7. Write the difference between RAM and ROM?
- 8. Explain the three types of primary memories?
- 9. Which of the following memories is non-volatile? (a) ROM (b) Cache (c) RAM (d) All of these
- 10. Write the names of any two auxiliary memories and their characteristics.
- 11. Explain any five secondary (auxiliary) memory devices.
- 12. Arrange the following computer memories in ascending order of their speed
 - Register, Hard disk, Cache memory, RAM
- 13. Select the odd one out .State the reason. MAR, RAM, flash memory card, CD
- 14. Briefly explain any five input devices.
- 15. List any two graphic input devices
- 16. Compare CRT and LCD displays.

- 17. Explain the different types of monitors available in the market.
- 18. What are the two types of plotters?
- 19. Explain various output devices
- 20. Explain any three output devices
- 21. Pick the odd one out : (a)Printer (b) Plotter (c) Scanner
- 22. Match the following –

А		В	
a.	Registers	i)	Output Device
b.	Port	ii)	Blu Ray DVD
c.	Memory	iii)	VGA
d.	Output Device	iv)	Program Counter

- 23. Categorise the following devices into two. Name each category : Plotter, LCD, Joystick, OMR, DMP, Microphone
- 24. Consider the following devices and categorise them according to input, output, and storage devices. Light pen, Flatbed plotter, Drum plotter, Joystick, OMR, Ram, Optical disc, Magnetic disk, MICR, Thermal printer, USB flash drive, Three dimensional (3D) printer.
- 25. Categorize the following devices and explain the usage
- QR Code Reader, Biometric sensor, Flatbed plotter, 3D printer, Digital camera
- 26. What is e-waste?
- 27."E-waste management is very important for the existence of future generations". Justify the above statement.Substantiate your answer with relevant facts.
- 28. "E-waste is hazardous to our health and environment". Justify the statement
- 29. Describe the methods commonly used to dispose of e-waste.
- 30. Briefly explain any three methods of e-waste disposal.
- 31. Due to safety reasons e-waste should never be handled carelessly. Suggest the ways to dispose e -waste safely.
- 32. Write the role of a student in disposing of e-waste.
- 33. Write any four methods used to promote green computing.
- 34.As a supporter of Green computing /IT ,what type of monitor will you suggest for him? Justify.
- 35. Anitha wants to buy a flat panel monitor. What are the different types of flat panel monitors ? Explain any two.
- 36. Define the term operating system.
- 37. System software and Application software are the two types of softwares. Name the system software that acts as an interface between user and the hardware.
- 38. List and explain the major functions of the operating system.
- 39. Why do we need language processors?
- 40. Explain different types of language processors.
- 41. Write the difference between interpreter and compiler.
- 42. Compare the language processors assembler and compiler.
- 43. Pick the odd one out (i) Assembler (ii) Compiler (iii) Compressor
- 44. What is utility software? Name any four utility software?
- 45. Match the following

А	В
a) Joystick	i) Plastic cups
b) DVD	ii) Magnetic storage
c) Hard disk	iii) Compiler
d) 3D printer	iv) Optical storage
e) Utility software	v) Games
f) Language processor	vi) Antivirus

- 46. List and explain general purpose application software with examples
- 47. Explain any two types of general purpose application software?
- 48. Categorize the given below in the operating system, application packages, utility software and language processor. (Linux, Tally ,WinZip ,MS -Word,Windows,MS -Excel ,Interpreter.)
- 49. Explain different types of application software
- 50. Explain Free & open source software?
- 52. Match the following

Α		В	
a)	Application software	i)	Winzip
b)	Utility software	ii)	Unix
c)	Operating System	iii)	Calc

53. Define the freedom which is given to users that make up a free software.

54. Briefly explain any three freedoms in open software.

- 55. Which freedom permits to distribute copies of the software?
- 56. Give an example of free and open source software?
- 57. Compare Freeware and Shareware.
- 58. Prepare a short note on (a) Freeware (b) Shareware

59. Define the following: (a) Freeware (b) Shareware (c) Human or live-ware