

COMPONENTS OF THE COMPUTER SYSTEM

- System refers to the set of components working together to attain a specific objective.
- As a system, computer accepts data as input process it & provide information as output.
 - Data is a collection of “raw facts”, having no proper message to convey. eg.– Anu, 12, 17
 - Information is collection of processed data, which convey an exact meaning / message. eg. Anu is a 12th standard student of age 17.
- Data processing
 - Set of activities performed to convert data into information [raw facts into processed data] is known as data processing.

<u>Data processing activity</u>	<u>Explanation</u>	<u>Considering +1 admission as example</u>
Capturing data	Collecting data in proper order & in proper format	Receiving applications for +1 admission
Input	Collected data is transferred to computer for processing.	Collected applications are inserted to computer.
Storage	Before processing the collected data will properly stored in computer memory.	After entering all the details of applicants, properly save it in any folder.
Processing	Includes 1. Classifying → grouping the data into similar groups 2. Calculating → making mathematical calculations if needed. 3. Sorting → Arranging data in a specific order 4. Summarizing → Briefing the processed data based on our requirement	Applications are classified on the basis of science, commerce & humanities Finding the total obtained by each student. Details of students are arranged on the basis of descending order of total. By taking details like application no, name of the applicant & rank a list will be prepared.
Managing Output	The processed data [information] will properly stored & keep in a place where it is easy to retrieve.	Details of the rank list for +1 admission is properly saved & kept in CDs, pendrives & in computer memory
Distribution of information	The information produced by the data processing activities, must properly conveyed to the required persons / beneficiaries for taking	Details of rank, date of admission etc will convey to applicants, based on which they can take decision about admission.

- Functional units of computer
 - Input Unit
 - Which helps to receive data from the user in various forms like number, text, image, audio etc?
 - eg:- keyboard, mouse, scanner, digital camera, microphone etc.
 - CPU
 - Central Processing Unit
 - Each & every activity performed in a computer system is controlled by CPU, which is the brain of computer.
 - Various components of CPU includes
 - 1. ALU [Arithmetic & Logical Unit]
 - Operations specified in the instructions are performed in ALU.
 - It performs mathematical & logical operations like comparisons & transfers the results to primary or secondary memory.
 - 2. Control Unit
 - Control unit assigns tasks to various functional units of a system.
 - It manages & coordinates the functions of various units.
 - It receives instructions from program stored in computer memory, performs the operation & issues the signals to the required functional unit.
 - 3. Registers
 - They are temporary storage elements providing proper back up to CPU.
 - Based on the tasks performed, registers are of different types.
 - Storage Unit
 - Place where data before processing & information after processing is stored.
 - It is classified into primary memory & secondary memory.
 - Primary memory which includes RAM & ROM is volatile memories, where data can be stored only if there is power supply.
 - It holds instructions, data & intermediate results temporally.
 - CPU has direct access over primary memory, so that data can be accessed at a very high speed.
 - Main drawback of primary memory is its low storage capacity.
 - Output unit
 - The processed data is conveyed to users through output unit.

- It receives data from CPU in coded form, translates it to human readable form & conveys the results.
- What do you mean by registers?
 - They are special additional storage locations which are not considered as a part of memory.
 - When compared to other memories, CPU has direct access over registers.
 - It stores the instructions & data temporarily.
 - Control unit controls the activities of registers.
 - It is of 5 different types

Type	Purpose
1. Accumulator	also known as register A, which stores the intermediary results of ALU
2. Memory Address Register [MAR]	Stores the address of memory location from where processor is going to read or write data.
3. Memory Buffer Register [MBR]	Stores the data that is to be read or write by the processor
4. Instruction register	stores the instructions to be executed by processor
5. Program counter	stores the address of next executable instruction

- Explain the following with eg.-

Terms	Explanations	Example
Hardware	Physical components of computer	processor, keyboard, monitor etc.
Software	Set of instructions given to various activities in a system	application softwares, system softwares
System software	Specifically required to run a system	operating system, language processors
Application software	Specifically used to run a particular application in system	media player, winamp, nero writing software etc

Utility softwares	set of programs that is directly installed along with operating system	paint, sound recorders etc
Freeware	software that can be freely download from internet	linux, Geany etc
Shareware	Softwares having trial version, which helps the users to try it with some limited features & if all features are needed, it is to be purchased.	various gaming softwares, application softwares etc
Human ware / live ware	one who uses computer	system administrators, analysts, operators etc

- What are language processors? Explain its various types.
 - Language processors are translators which convert high level language to low level language.
 - Computer languages are classified into machine language [only zeros & ones], assembly language [using mnemonics] & high level languages [like English languages].
 - Types of language processors

Language processor	Features
Assembler	1. machine dependent translator 2. converts instructions in assembly language to low level language
Interpreter	1. converts high level language instructions to low level language statement by statement 2. If there is any error in one statement, only after rectifying it next instruction will execute. 3. BASIC language uses interpreter.
Compiler	1. Converts the entire instructions in high level language to low level language in a single run. 2. Errors will be reported only at the end of translation.

	<p>3. The process of compiling a program is known as “compilation”.</p> <p>4. Languages like C, C++ etc uses compiler.</p>
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○ What is primary storage? What are its types?

- High speed memory capable of sending & receiving data, which is directly in touch with CPU.
- It is a semi conductor memory.
- It is of three types
 - 1. Random Access Memory [RAM]
 - RAM is a volatile memory, which means data stored in it will loss when power is switched off.
 - It holds the data to be processed by CPU, whose memory capacity is more than 2 GB.
 - Processor can read & write data to RAM.
 - MHz is the unit for measuring the speed of memory & while computer works it contains;
 - Operating system, currently using application software & any data or instruction to be processed by CPU
 - 2. Read Only Memory [ROM]
 - ROM is a non volatile memory, whose content is safe even when the power is off.
 - ROM supports only read operations & its content cannot be modified easily.
 - When computer is switched on, “booting” process will execute which identifies the OS present in a system & the instructions for that is stored in ROM as “ Basic Input Output System” [BIOS].
 - Types of ROM are
 - PROM → once programmed, cannot be modified.
 - EPROM → Erasable PROM, where once programmed instructions can be erased using ultra violet rays & can rewrite.
 - EEPROM → Electrically EPROM, where once programmed instructions can be erased electrically & can re programmed.
 - 3. Cache memory
 - Cache is an intermediary memory in between processor & RAM.

- Data once taken from hard disk through RAM, after usage will shift to cache memory & when it is again needed, processor can access it from cache memory.
- Cache memory speed up the process, but have small storage size than RAM & expensive also.
- Explain the term e- Waste
 - e-Waste, which refers to electronic waste includes those electronic products which cannot be reuse, resale or cannot able to recycle.
 - Due to rapid changes in technology, lot of electronic products is getting outdated day by day & only a minor portion of it can be recycled.
 - e-Waste includes out dated computer peripherals, equipments, mobile phones etc.
 - e- Waste is considered as dangerous threat to the world as it contains toxic substances like led, mercury etc which causes cancer, reproductive disorders & other health problems.
 - Lead coming out from computer monitors, circuit boards etc will leads to damages in blood systems, kidneys etc.
 - Mercury coming out from LCD screen will affect nervous system, brain, organ damage etc.
 - Cadmium coming out from chip resistors, semiconductors etc are the causes of cancer, kidney etc.
 - Due to lack of recycling, unsystematic dumping etc e-Waste create a lot of problems to soil, water & air.
 - Various methods of disposing e- Waste are
 - 1. Reuse of electronic products.
 - 2. Incineration, a process of burning of e-Waste at a high temperature in a incinerator.
 - 3. Recycling of e-Waste
 - 4. Landfilling
- What is Green computing / Green IT?
 - Green computing is the process of designing, manufacturing, using & disposing computer & its associated equipments without affecting the environment.
 - Green computing includes
 - proper turn off of system
 - using printers & other peripherals only when needed
 - using hardware / software with energy saver
 - using solar energy
 - In short green computing can be defined as effective & efficient eco friendly use of computers & their supporting equipments.
 - Green computing can be achieved through

- Green design → developing energy saver & eco friendly electronic equipments
 - Green manufacturing → reducing the waste during production process
 - Green use → efficient & wise electricity consumption
 - Green disposal → eco friendly disposal of electronic waste.
- What is operating system? Explain its functions.
 - Operating system comes in the category of system software, which is essential for the working of a system.
 - It act as a link or interface between user & computer.
 - It provides the environment for the smooth functioning of a system as it controls & co-ordinates each & every activity in a system.
 - Functioning of a computer starts by identifying the operating system present in it & it is active till the system is shutdown.
 - Major functions of OS includes
 - Process management
 - Proper allocation & de allocation of resources based on the instruction of user.
 - Memory management
 - Proper allocation of primary memory to each process & de allocating it after usage.
 - File management
 - Refers to the proper storing, retrieving, securing etc of data. [file refers to storage location]
 - Device management
 - Proper managing of the hardware as well as software techniques related to system.
 - What are the various utility softwares?
 - Compression tools → used for compressing / zipping large files into small size, with our affecting the content. When needed it can be decompress / unzip to original size. Winzip is the common compressing software.
 - Disk defragmenter → Breaking up of a software into different modules & arranging it in free available memory spaces.
 - Back up software → used to make a duplicate copy of information, which can be used if the original data is lost.
 - Antivirus software → Vital Information Under Siege [VIRUS] refers to set of programs that can harm the working of a system & using antivirus softwares it can be prevented.
 - What are the freedoms provided by free / open source software?
 - Freedom 0 → run / use program for any purpose user needs

- Freedom 1 → providing source code of the software to user
- Freedom 2 → duplicate / reproduce the copies of softwares
- Freedom 3 → to modify & upload the software as per our discrimination