Module-1-2 Hardware and its components

1) What is input device ?

→ A piece of equipment our hardware which helps us enter data into a computer is called an input device.

ex. ⇒ keyboard
⇒ mouse
⇒ Scanner.
⇒ Cameras.
⇒ joysticks
⇒ microphones.

2) What are output device ?

→ A piece of equipment/hardware which gives out the result of the entered input. once it is processed data. from machine language to a human is called an output device.

ex. ⇒ Monitor.
⇒ Printer.
⇒ Speakers
⇒ Projector.
⇒ Headphones.

→ this all mentioned device is most commonly used.

3) What is CPU ?

→ The computer's "Central Processing Unit (CPU)" is the portion of a computer that retrieves and executes instructions.

⇒ CPU is the heart and brain of Computer.

⇒ CPU is functionally the most important component of a Computer system.

→ CPU has three significant part.

- ALU (Arithmetic Logic Unit)
- Control Unit
- Storage Unit

* ALU :-

→ This section is to perform various arithmetic operations that are usually performed. addition, division, multiplication, and Subtraction

→ logic section performs the functions of carrying out logic operations. comparing, merging, etc.

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* Control Unit.

→ Control Unit is responsible for handling all operations of the system.

* Storage Unit.

→ This Unit is storing all information and data that is saved on the computer system.

4) What are the types of CPU ?

→ Six differents types of CPU.

- Single - Core CPU (1)
- Dual - core CPU (2)
- Quad - Core CPU (4)
- Hexa - Core CPU (6)
- Octa - Core CPU (8)
- Deca - core CPU (10).

5) What do we need to keep the CPU Healthy ?

→ Avoid turn your computer OFF using the power switch and purchase a UPS. Always work to switch OFF your PC manually.

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→ open the door if your CPU is hidden into any closed desk or box.

→ It's important to assess if your fan is working correctly or not. Heat is moved out of their computer's case by several fans.

→ If your CPU case doesn't allow you to add additional fan then replace power supply.

→ If open CPU clean with cotton swabs, tweezers, and rubbing alcohol.

→ try to reduce the temperature of CPU using big fan.

→ Regularly update your computer system.

→ this all reason to keep the CPU healthy.

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(6) Do a Practical to remove Processor and apply thermal Paste in it and install it again.

Step of apply thermal past :-

1. Take off the cooling Fan and its Supply Cable.

2. Use an alcohol + Cotten Swab + Paper Towel Combo to clean the old thermal Paste of your heat sink.

3. Use thermal Paste remover to clean the old thermal Paste off your CPU.

4. Wait 2 minutes for the Surfaces to dry.

5. Use good thermal paste and apply the thermal Paste onto the CPU ONLY.

6. Reinstall your heatsink by Carefully placing it on top of the CPU and tightening the Screws.

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(7) How Practically to Identify CPU and its Sockets.

→ See one fans inside the CPU. CPU is in square form. that is CPU.

→ the large heat sink and fan installed above it.

→ You should find the Socket type written Underneath the socket on the motherboard.

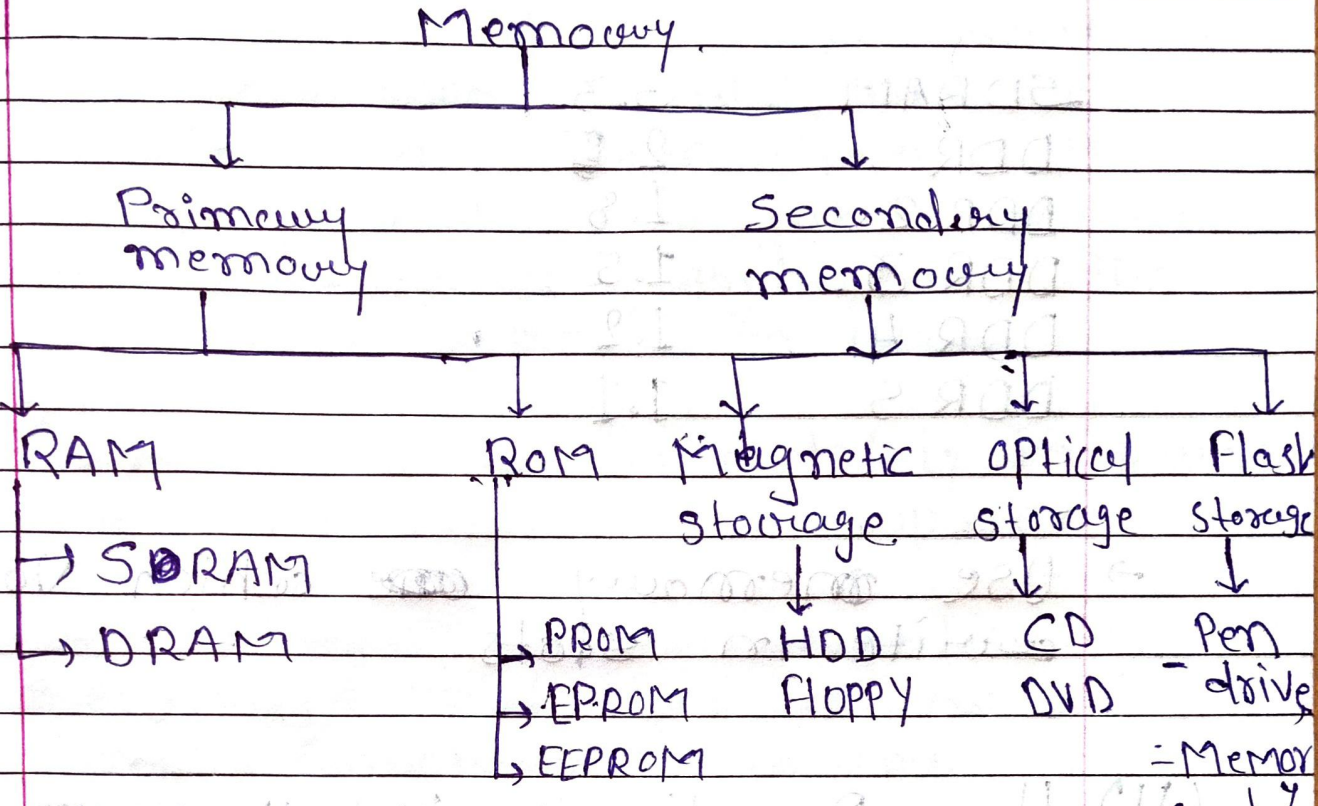
8) What is memory?

→ Memory is the electronic holding place for the instructions and data a computer needs to reach quickly.

→ It's where information is stored for immediate use.

→ Memory is one of the basic functions of computer, because without it a Computer would not be able to function properly.

(9) What are the types of memory.



(10) How to practically identify memory types.

→ First find the memory slots in motherboard.

→ In the memory slots middel write the voltage of supported memory.

→ all memory have Specific Voltage.

SDRAM	3.3
DDR	2.5
DDR 2	1.8
DDR 3	1.5
DDR 4	1.2
DDR 5	1.1

→ Use memory which Voltage write in slots.

(11) How Pracieticelly install memorie in system.

→ Locate the memory slots on the Computer motherboard.

→ Now, you need to ensure that the notches on the memory stick are matched to the memory slot you are using.

→ then you must slide each memory slot tab out or away from the memory module in order. install memory into the Computer

→ the memory module is placed. these tabs will snap into position

→ Next, gently and firmly insert the memory module into the slot. when the memory module is being pushed, two tabs should snap together and hold the memory module in place.

→ when you have completely installed the memory in the computer.

→ RAM should be automatically recognized and set up at the time Computer is booting.

(12) How Practically to identify main memory frequencies.

→ check RAM frequency on windows devices, you can use either the task Manager or Command Prompt.

→ Right-click anywhere on the taskbar and select task manager from menu or use the windows + X command to open this menu.

→ ctrl + Alt + Delet Command.

→ Navigate to the performance tab.

→ on the list on the left, you'll see various entries such as CPU, Memory, Disk 0, Wi-Fi, GPU and so on. Select memory.

→ Memory window that appears on the right side of the Task Manager screen.

→ See the speed entry. This number indicates the speed (frequency) of your RAM Module.

13) What is BIOS ?

→ BIOS (basic input/output system) is the program a computer's microprocessor uses to start the computer system after it is powered on.

→ It's also manages data flow between the computer's operating system and attached device.

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14) Describe working process of BIOS.

→ BIOS Identifies, Configures, tests and connects computer hardware to the OS immediately after a computer is turned on.

→ Combination of these steps is called the boot process.

1. Power-on-Self-test (POST)
   - This tests the hardware of the computer before loading to OS.

2. Bootstrap loader.
   This locates the OS.

3. Software/drivers.
   This locates the Software and drivers that interface with the OS once running

4. CMOS Setup.
   This is a configuration program that enable user to alter hardware and system settings.

15) How practicaly reset BIOS when system is on.

→ Turn on your computer and Press and hold the setup key at startup.

→ Depending on During your PC may be the the F2 or the F10 key.

→ In the BIOS menu of your Computer, use the arrow keys to navigate between individual menu items.

→ The reset the computer select the menu item lebeled "setup Dafault" or Similar.

→ The opetion could also be labeled "Load Setup Defaults" or "Reset to Default". Comfirm your selection by Pressing ENTER.

→ Now likely confirm that "Default configuration" the factory settings are being loaded.

→ one confirmed the BIOS reset is Performed automaticaly.

16) How Practicaly of Hard resetting the BIOS.

→ In two way hard resetting the BIOS.

1) Removing the CMOS Battery

→ Power down your computer.
→ Unplug your computer from any power sources.
→ Remove your computer's Battery if necessary.
→ Discharge any static electricity before continuing.
→ Open your case.
→ Remove the CMOS battery.
→ Press your power button.
→ Reinsert the CMOS battery.
→ Reassemble your Computer.
→ Reconnect your computer's Power Source.
→ Turn back on your Computer. then BIOS is Reset.

2) Resetting the Jumper.

→ Power down your computer.
→ Unplug your computer from any power sources.

→ Remove your computer's battery if necessary.
→ Discharge any static electricity before continuing.
→ Open your case.
→ Find the CMOS jumper.
Locate the three-pin jumper.
→ Move the jumper to the other two pins.
→ Press your Power button.
→ Return the jumpers to its default Position.
→ Reassemble your computer.
→ Reconnect your computer's Power
→ Turn back on your computer.

then resetting the BIOS.

17) How Practicely indentifying BIOS chip from the motherboard.

→ Identify the BIOS chip on a motherboard in two ways.

1. Using the Motherboard Manual
2. Through physical Inspection

1. Using Motherboard manual.

→ All motherboard manuals have the motherboard layout diagram.

that highlights all the Critical components located on them.

- → You can quickly find the location where you would find the BIOS Chip.

2.@ Identifying BIOS chip through physical Inspection.

→ all Critical Components on a motherboard have labels indicating precisely what they are.

→ BIOS chips often have the labels M-BIOS, UEFI, BIOS etc.

→ The motherboard above, for instance has two BIOS chips clearly labeled as M_BIOS and B. BIOS. respectively.

18) What is motherboard?

→ A motherboard is the main printed Circuit board in a computer. The motherboard is a computer's Central Communications backbone Connectivity point, through which all components and external peripherals connect.

19) Describe types of motherboard.?

→ AT (Advanced Technology)
→ ATX (Advanced Technology Extended)
→ Micro ATX
→ Mini ATX
→ Extended ATX
→ Flex ATX
→ Low-Profile Extended (LPX)
→ BTX
→ Pico BTX

20) How Perfectly by identifying parts of motherboard.

(1) Visually Identifying
(2) Using Motherboard Manual.

Using this two methods identifying the parts of motherboard.

21) What is CMOS ?

1. CMOS is one type of Battery.

→ Alternatively known as an RTC (Real-time clock). NVRAM (non-volatile RAM), or CMOS RAM, CMOS. is short for complementary metal-oxide Semiconductor.

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→ CMOS is an onboard, battery-powered semiconductor chip inside computers that stores information.

→ This information ranges from the system time and dates to your computer's hardware settings.

→ The picture shows an example of the most common CMOS coin cell battery used to power the COMS memory.

22) Practically Removing all removable parts from the motherboard.

→ The first step involves powering down the CPU, monitor and other external device connected to the computer.

→ All the expansion cards are removed
→ The keyboard is disconnected from the CPU cabinet.
→ SMPS power connector which is connected to the motherboard is disconnected. and Remove the SMPS.

→ Remove any connectors for the floppy, Hard drives, USB Port, Serial and Parallel ports.

→ Remove Floppy, Hard drives, DVD Riders all external Parts.

→ Remove the graphics accelerator Curd if available.

→ Remove all Ram in motherboard.

→ Remove all the Screws that are on the connect with at componant.

→ Remove the fan and hitsinks, open sockets and Remove the Processor.

23) what is system bus ?

→ System bus is a single Computer bus that connects the major components of a computer system.

→ Combining the functions of a data bus to Curry information, an address bus to determine where it should be sent or read from, and a Control bus to determine its operation.

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24) what is chipset and types of chipset ?

→ electronic chipset manages the flow of data between components on a motherboard.

→ the traffic Controller between the CPU, GPU, RAM, storage and peripherals.

→ The chipset is basically the electronics on the motherboard that communicate with all the connected components.

There are two main chipsets:

1) the Northbridge
2) the Southbridge

25) Describe how does the Northbridge chipset work.

→ A northbridge is connected directly to a CPU via the front-side bus (FSB) to handle high-performance tasks.

→ Usually used in conjunction with a slower Southbridge to manage communication between the CPU and other parts of the motherboards.

→ It also connects Peripherals via high-speed channels such as PCI Express.

→ Northbridge typically handles communication among the CPU, some cases RAM, PCI Express, Video cards, and the Southbridge.

26) What is SMPS ? And its Purpose.

→ Switched mode power supply (SMPS) is an electronic power supply system that makes use of a switching regulator to transfer electrical power effectively.

→ It is a PSU (Power supply unit) and is usually used in computers to change the voltage to to appropriate range for the computer.

→ Purpose of the SMPS is change the voltage to the appropriate range for the computer.

→ SMPS device. the switching regulate are used which switch on and off the load current to maintain and regulate the voltage output.

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27) How to Practiced install SMPS ?

1. Switched off and unplug Power Supply of CPU.
2. Open the CPU housing box.
3. Unplug the all wires and cable attached to the CPU.
4. the right-hand Side of the CPU box when looking at the back of the box.
5. the Power Supply to determine whether or not this is the case.
6. Gently Place the Unit inside the case so that its Screw holes line up with the holes in the case
7. Insert the included Screws to lock the Power Supply into place. The all connection are Connect to the CPU.
8. all connector are Connect with the CPU board.
9. close and plug back in your PC. Place the cover back on the PC.

10. Turn on your computer. If everything is connected and powered properly.

11. the fan on the power supply should turn on and your computer will boot like usual.

28) How to check smps ?

→ Count its pin from the right side towards the left.

→ Stop at 4 and 5 pins of the connector.

→ Grab a paper clip or any metallic wire make a U-Shape of that.

→ Insert one end of that U-shape wire in 5th and other in 4th Pin of the connector.

→ And leave it as it is to jump-start your power supply.

→ the SMPS and insert its power cord and switch ON the Power button. if you have on your Power Supply. If you don't have any button then just attach the power cab

→ The moment you insert the Power cable and turn the SMPS Power button ON, its heat dissipation fan will automatically start rotating this means your SMPS is absolutely fine and working.

29) List out the types of storage device.

→ types of storage device.

- Permanent
- Temporary.

→ Permanent storage.

1. Hard Disk drive.
2. Magnetic tape device
3. Floppy Disks.

→ Flash storage types

4. SSD (solid state Drive)
5. USB Flash Drive
6. SD Card.

→ Optical storage types

7. CD
8. DVD
9. BluRay Disks

→ online storage.

10. cloud storage.

→ Temporary storage.

11. RAM (Random Access Memory)
12. ROM (Read Only Memory)
13. Cache Memory.

30) Describe the working process of storage device.

→ Magnetic storage use mechanical device known as a drive that connects to the computing device. The disk coated with iron oxide stores the information and is inserted into the drive. The drive rotates the disk at high speed via motor.

→ The stored information is accessed by the drive using tiny device called read/write heads that contain electromagnets. electromagnets is sent to the computer as binary data. This is transferred and converted to machine code.

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31) How to practical Remove storage device and reinstall it and make a gpt disk.

Remove storge device :-

→ Back up your data.
→ Turn off your computeer and unplug it.
→ open the computeer case.
→ Locate the heard derive inside the Computeir.
→ Determine how the heard derive is connected to the computer.
→ Disconnecet the cebles attaching the heard derive to the motheerboaird.
→ Remove the heard derive
→ Take the heard derive oect of the case and Pat it into an anti-Stetic bag.

→ Reinstall storge device :-

→ Remove your computeer panel.
→ Fix the derive cage to heard derive.
→ Secuere the heard derive.
→ Slide the heard derive baek into the ruse.
→ Attaeh the derive to the motheerboaird.
→ Connect the power suppiy to the heard derive.
→ close up your Computeer
→ plug in your computeer and Powes it baek on.

→ Format the heard dirive.

→ Format this hard drive in UEFI firmware formate.

→ Using USB flash drive process step by step.

→ UEFI is GPT format also after installation to make as GPT disk.

32) What is SATA ?

→ SATA is a hard drive interface that you use to read and write data to and from the storage.

→ This could be SSD, HDD, and the Computer. They're also known as serial ATAs, and you can find them on servers, computers, gaming consoles, and even servers.

33) Describe the working of SATA.

→ Serial ATA (SATA) is a command and transport protocol that defines how data is transport protocol that defines how data is transferred between mass storage device and computer motherboard such as optical drives, solid state drives, HDD.

→ SATA is based on serial signaling technology where you can transfer data as a sequence of individual bits. SATA cables connect optical drives and hard drives to computers.

34) What is SCSI storage and type of SCSI ?

→ SCSI (Small computer system Interface) is a smart bus, controlled with a microprocessor, that allows you to add up to 15 peripheral device to the computer.

→ These device can include hard drives, Scanners, printers, and other peripherals. High-end single SCSI boards have two controllers and support up to 30 Peripherals on single expansion Card.

→ type of SCSI.

→ SCSI 1
→ SCSI-2
→ Fast SCSI
→ Wide SCSI
→ 8-bit ultra SCSI-3
→ 16-bit ultra SCSI-3
→ 8-bit Ultra-2 SCSI-3
→ wide Ultra-2 SCSI
→ Serial Attached SCSI

35) What is I/O ports ?

→ Input/output port is a socket on a computer that a cable is plugged into. The port connects the CPU to a peripheral device via a hardware interface or to the network via a network interface.

→ Input/output port is an address used to transfer data.

36) List out the I/O port available

→ Serial port
→ Parallel port
→ USB port
→ PS-2 port
→ Infrared port
→ Bluetooth port
→ Fire wire port
→ Ethernet port.

37) What is Boot Process ?

→ Boot process is basically the process of starting the computer. When the CPU is first switched on it has nothing inside the memory.

In operating system into the main memory and then computer is ready to take commands from the user.

Step:-

→ The Startup.
→ BIOS: Power on Self Test
→ Loading of OS
→ System Configuration.
→ Loading System Utilities.
→ User Authentication.

38) Describe the Boot Process in Linux?

→ The boot microcode or BIOS of the machine hundreds and executes a boot loader.

→ The boot loader catches the kernel image over the disk and ships it into memory to begin the computer.

→ The kernel boots the devices and drivers.

→ The kernel ~~boots~~ mounts the common filesystem.

→ The kernel begins a program called init with a zird method ID.

→ Init Configures the system processes remainder in motion.

→ Init begins a method allowing us to log in for some purpose, typically at the close or top to the head of the boot order.

39) List out the types of display?

→ CRT display monitor.
→ LCD display monitor
→ LED display monitor.
→ TFT display monitor.
→ Touchscreen monitor.
→ Plasma Screen monitor
→ OLED monitor.

40) What is printer? And type of printer

→ A printer is hardware output device that is used to generate hard copy and print any document. A file document can be any type such as a text file, image, or the combination of both.

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Types of printers.

→ Inkjet printers
→ Laser printers
→ 3D Printers
→ LED printers
→ Solid Ink printers.
→ Dot matrix Printers.
→ multifunction or All-in-one printers.
→ Thermal printer.
→ plotter.

41) How practicaly install the printer?

→ Read the installation guide for your printer if you have it.
→ Plug the printer into your computer.
→ turn the printer on.
→ Wait for your operating system to detect and install the printer.
→ Install the Software that came with the printer.
→ Download the drivers from the manufacturer's website.
→ Run the downloaded drivers.

42) How practicaly to troubleshoot the improper printing.

1. fill ink and increase toner levels.
2. remove probe of low ink and toner density setting.

3. ~~avoid~~ Printer locate at neither too humid nor humid enough.

4. Remove the ink cartridges from the printer.

5. Re-insert the cartridges and run the print head cleaning process from your printer menu.

6. Run a diagnostic print from the printer menu to confirm which colours are causing a problem.

this a Solution of Printing Propeer.

43) What are the Parts of laptop?

→ Display Screen.
→ TOP Panel
→ Base Panel
→ Keyboaard.
→ Touchpad.
→ Motherboaard
→ CPU
→ cooling fan.
→ RAM

→ ROM
→ HDD
→ SSD
→ wireless card
→ Video card
→ optical drive.
→ Battery
→ Charger.
→ Speaker.
→ Hinges
→ External ports.
→ Camera.
→ Palm Rest Assembly

44) Practical to disassemble the laptop?

→ Turn off the computer.
→ Remove back panels.
→ Remove components one by one. also remove Screws and Removes all part one by one.
→ Remove hinge cover Plate.
→ Remove laptop Screen and its cable.
→ Remove Screw.
→ Pry case apart.
Remove the touchpad and continue to remove Screws and disconnect the cables attached to motherboard.

→ Follow this step in Reverse.