

Module-1,2 Hardware and its components

Q-1) What is Input devices?

→ An input device is something you connect to a computer that send information into the computer.

Q-2) What are output devices?

→ There are many outputs created by a computer system. These include printed documents, on-screen data & sound. An output device allows data to be transmitted by the computer.

Q-3) What is CPU?

→ CPU is short for Central Processing Unit. It is also known as processor or microprocessor. It's one of the most important pieces of hardware in any digital computing system.

Inside a CPU there are thousands of microscopic transistors, which are tiny switches that control the flow of electricity through the integrated circuits.

Q-4) What are types of CPU?

- i) Single-core CPU ii) Hex-core processor
- ii) Dual-core CPU vi) Octa-core processor
- iii) Quad-core CPU vii) Deca-core processor

Q-5) What do we need to keep the CPU healthy?

→ ~~①~~ Buy Uninterruptible Power Supply (UPS) A UPS is, in essence, a battery.

Buy high-quality power supply

Buy two ~~meth~~ motherboards

Keep dust away by using lots of fan redundancy

Temperature control

monthly ~~monthly~~ maintenance.

monthly maintenance.

Q-6) ~~Q-6)~~ Do a protocol to remove processor and apply thermal paste in it and install it again.

→ Step 1:- Gain Access to CPU cooler

Step 2:- Remove the CPU cooler

Step 3:- Wipe off Existing Thermal Paste

Step 4:- Remove the CPU

Step 5:- clean the CPU and its socket

Step 6:- Put CPU back in that socket

Step 7:- Apply fresh Thermal Paste

Step 8:- Mount the CPU cooler

Step 9:- Assembly is the Reverse of Disassembly

Q-7) Do a practical to identify CPU and its sockets.

→ Step 1:- Turn off the computer and remove the power cables.

Step 2:- Remove the case cover and turn the computer on its side.

Step 3:- Locate the CPU. This will be easily distinguishable by the large heat sink and fan installed above it. You should find the socket type written underneath the socket on the motherboard.

CPU

Step 1:- Press on the windows key on your keyboard and start typing System, choose System information which will show Processor information with the name, number, and speed of the processor.

Q-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 a computer, because without it, a computer would not be able to function ~~properly~~.

Q-9) What are types of memory?

- > i) Long-Term Memory
- ii) Short-Term Memory
- iii) Explicit Memory
- iv) Implicit Memory
- v) Autobiographical Memory
- vi) Memory of Morphemes

Q-10) Do a practical to identify memory types.

-> Step 1:- Press Windows key

Step 2:- Search Task manager

Step 3:- Press on More details

Step 4:- Press on Performance

Step 5:- Press on memory

Q-11) Do a practical to install memory in system

-> First shut down your computer and unplug all of the cables connected to it. Then remove the sides of the computer case so you can access the motherboard.

The RAM slots are adjacent to the CPU socket. Look for the big heat sink at the top of the motherboard, and you'll see either two or four memory slots next to it.

Q-12) Do a practical to identify main memory frequencies.

→ Step 1:- On your keyboard, press the Windows logo key and R at the same time to invoke the Run box. Type cmd in the box and press Enter.

Step 2:- Type "wmic memorychip get speed" into command prompt window, and hit Enter. This command will allow you to check your RAM chip's speed.

Q-13) What is BIOS

→ As your PC's most important startup program, BIOS, or Basic Input/Output System, is the built-in core processor software responsible for booting up your computer system. Typically embedded into your computer as a motherboard chip, the BIOS functions as a catalyst for PC functionality & action.

Q-14) Describe working process of BIOS

→ BIOS is the program a computer's microprocessor uses to start the computer system after it is powered on. It also manages data flow between the computer's operating system and attached devices, such as the hard disk, video adapter, keyboard, mouse & printer.

Q-15) Do a practical to reset bios when system is on.

→ Step 1:- Navigate to the settings tab under your start menu by clicking the gear box.

Step 2:- Pick the Update & Security option and select Recovery from the left sidebar.

Step 3:- You should see a Restart now option below the Advance Setup heading, click this whenever ~~you're~~ you're ready.

Step 4:- When your computer restarts, it should load a blue screen with advance troubleshooting options.

Step 5:- Select Troubleshoot and then click Advance option from the resulting options.

Step 6:- Choose UEFI Firmware settings and click Restart to continue.

Q-16) Do a practical of Hard Resetting the BIOS.

→ Step 1:- Power on or Restart the workstation.

Step 2:- Enter the BIOS by tapping either the right or left bottom of the screen.

Step 3:- Tap Advance, and then tap Special Configuration.

Step 4:- Tap factory Recovery.

Step 5:- Select Enabled from drop-down menu.

Step 6:- Tap Home

Step 7:- Tap Save and Exit

Q-17) Do a practical of identifying BIOS chip from the motherboard [what is CMOS?]

→ The CMOS chip is found inside the chipset, and the CMOS battery is a small circular battery found in the bottom right-hand corner of the motherboard. Panasonic CR 2032 3V is the most commonly used CMOS battery in PC's.

→ Complementary metal-oxide-semiconductor (CMOS) is a small amount of memory on a computer's motherboard that stores the Basic Input/Output System (BIOS) settings. The BIOS is the software stored on the memory chip on the motherboard.

Q-18) What is motherboard?

→ The motherboard is the backbone that ties the computer's components together at one spot and allows them to talk to each other. Without it, none of the computer pieces, such as the CPU, GPU, or harddrive, could interact.

Total motherboard functionality is necessary for a computer to work well.

Q-19) Describe types of motherboard.

- i) AT motherboard standard - ATX
- ii) ATX motherboard
- iii) LPX motherboard Mini - ITX
- iv) BTX motherboard Nano - ITX
- v) Pico BTX motherboard Pico - ITX
- vi) Mini ITX motherboard

Q-20) Do a practical by identifying parts of motherboards.

- i) CPU socket
- ii) Chipset
- iii) DZMMI/RAM slots
- iv) PCIe x16 slot
- v) PCI x1 slot
- vi) M.2 connector
- vii) SATA ports
- viii) Front panel connectors
- ix) ~~USB 2.0~~ USB 2.0 headers
- x) USB 3.1 Gen1 headers
- xi) USB 3.1 Gen2 headers
- xii) ATX power connector
- xiii) CPU power connector
- xiv) ~~BIOS~~ BIOS chips
- xv) CMOS battery
- xvi) Fan headers
- xvii) Front panel headers
- xviii) VRM heatsink
- xix) COM/serial headers
- xx) TPM headers
- xxi) RGB headers

Q-21) Do a practical by removing all removable parts from the motherboard.

-> Step 1:- Unplug your computer and peripheral items

Step 2:- Remove side covers

Step 3:- Disconnect connectors

Step 4:- Remove standalone fans

Step 5:- Remove the storage drive

Step 6:- Remove memory (RAM) modules

Step 7:- Remove ~~power~~ power supply unit

Step 8:- Remove motherboard adapter or expansion cards

Q-22) What is system Bus?

-> A system Bus is a single computer bus that connects the major components of a computer system, combining the functions of a data bus to carry information, an address bus to determine where it should be sent or read from, and a control bus to determine its operation.

Q-23) what is chipset and types of chipset?

→ The chipset is a silicon backbone integrated into the motherboard that works with specific CPU generations. It relays communications between the CPU and the many connected storage and expansion devices.

Types of chipset

- 5.1 Pentium 4 / Pentium D / Pentium EE chipset
- 5.2 Pentium M / Celeron M mobile chipset
- 5.3 Core / Core 2 mobile chipset
- 5.4 Core 2 chipset
- 5.5 Core 2 mobile chipset
- 5.6 southbridge 9xx and 314 Series chipset

Q-24) Describe how does the Northbridge chipset work. What is SMPS? And its purpose. Do a practical to install SMPS.

→ Northbridge is an Intel chipset that communicates with the computer processor and controls interaction with memory, the Peripheral Component Interconnect (PCI) bus, Level 2 cache, and all Accelerated Graphics Port (AGP) activities. Northbridge communicates with the processor using the frontside bus (FSB).

→ 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 the appropriate range of the computer.

How to install SMPS

→ Step 1:- Before Replacing the SMPS unplug all the wires and cables attached to the CPU.

Step 2:- Gather all your tools and open the CPU housing which is usually the right-hand side of the CPU box when looking at the back of the box. You may need a different screwdriver for your power supply or well-lack at the screws that came with the power supply to determine whether or not this is the case.

Step 3:- Gently ~~remove~~ place the new PSU unit inside the case so that its screw holes line up with the holes in the case. With the "back" of the power supply unit pressed against the back of the case, insert the included screws to lock the power supply in place. The ~~top~~ connection for AC power cord should be facing to the outside of the case. Now fix the screw.

Step 4:- Find the main power cable on the power supply and insert 24 pin connector in a motherboard, then attach the secondary power cable to the motherboard.

Step 5! - Using the smaller cables, connect the power supply to your computer's hard drive, CD drive, and graphics card. If you have other components in your case, you may need to plug these in as well.

Step 6! - For hard drives & CD drives, use larger 4-Pin ~~auxiliary~~ connectors for IDE drives and Serial ATA power connectors for serial ATA drives, but do not plug both types into one device. Use a 6/8 Pin connector for video cards.

Step 7! - Close and plug back in your PC

Step 8! - Turn on your computer

Q-25) How to check SMPS?

→ Grab a paper clip or any metallic wire make a V-shape of that. Insert one end of that V-shape wire in 5th 5th and other in 4th pin of the connector. And leave it as it is to jump-start your power supply. Go to the SMPS and insert its power cord ~~to~~ and switch ON the power button, if you have on your power supply.

Q-26) List out types of storage devices.

-> Cloud storage

Online backup

External storage devices

External ~~o~~ HDs and ~~S~~SSDs

Flash memory devices

Optical Storage Devices

Floppy Disk

Primary storage:- RAM

Q-27) Describe the working process of storage devices.

-> A storage device is any type of computing hardware that is used for storing, reading or extracting data files and objects. Storage devices can hold and store information both temporarily and permanently. They may be internal or external to a computer, server or computing device.

Q-28) Do practical to Remove storage ~~device~~ and reinstall it and make a gpt disk.

-> Step 1:- Open the computer window on your PC.

Double-click the computer icon on the desktop, or open the Start menu and choose Computer.

Step 2:- Right -Click the external storage device's icon

Step 3:- from the pop-up menu, select safely Remove.

Step 4:- Unplug or detach the external storage device

Make a

- At the windows setup window, press the SHIFT+F10 key combination to launch Command Prompt Window. At the ~~cmd~~ cmd window, input the above commands: diskpart -> list disk -> select disk# -> clean -> convert gpt.

Q-29) What is SATA?

- ⇒ SATA (Serial Advanced Technology Attachment) is a command and transport protocol that defines how data is transferred between a computer's motherboard and mass storage devices, such as hard disk drives (HDDs), solid-state drives (SSDs).

Q-30) Describe the working of SATA.

- SATA transfers data one bit at a time between a drive and its host, using a ~~40~~ 40-pin data cable and 15-pin drive power connector cable. The SATA cables results in a higher signaling rate, which corresponds to faster data throughput.

Q-31) Do a practical to install SATA?

- Step 1! - Unscrew and remove the sides of your computer tower's case to expose the internal hardware and wiring. Make sure you have unobstructed access to the motherboard's SATA ports and harddisk bay.

Step 2:- Insert the SSD into the mounting bracket or a removable bay. Make sure it's lined up with the ~~the~~ corresponding holes underneath before screwing into position.

Step 3:- Connect the L-shaped end of a SATA cable to the SSD. Connect the other end of the SATA cable to spare SATA port.

Q-32) What is SCSI storage and types of SCSI?

→ Small Computer System Interface is a set of standards for physically connecting and transferring data between computers and peripheral devices. The SCSI standards define commands, protocols, electrical, optical and logical interfaces.

Type of SCSI

Original SCSI

Wide SCSI

Fast SCSI

Fast wide SCSI

Ultra SCSI

Wide Ultra SCSI

Ultra 2 SCSI

Wide Ultra2 SCSI

Ultra³ (Ultra160) SCSI

Ultra3 SCSI

Q-33) What is I/O ports?

→ A I/O port is a socket on a computer that a cable is plugged into. The port connects the CPU to a peripheral device via ~~hard~~ a hardware interface or to the ~~netw~~ network via a network interface. So port, standards-hardware interface, Display port, HDMI & USB.

Q-34) List out I/O ports available Do a practical to -
identify the I/O ports & what is Boot Process?

→ List of I/O ports

i)	Vga	ps/2
ii)	mini dvi	sata
iii)	hdmi	eSATA
iv)	audio	Ethernet
v)	optical audio	modem
vi)	dvi-i	usb type A
vii)	dvi-d	usb type B
viii)	thunderbolt	usb type C
ix)	display port	usb micro
x)	mini displayport	usb mini

→ Booting is the process of starting a computer by initiated via hardware such as a button or by a software command. After it is switched on, a computer's central processing unit has no software in its main memory, so some process must load software into memory before it can be executed.

Q-35) Describe the boot process in Linux? List out the types of display?

- > The machine's BIOS or boot microcode hundreds of times and runs a boot loader.
- > Boot loader finds the kernel image on the disk and loads it into memory, to start the system.
- > The kernel initializes the devices and their drivers.
- > The kernel mounts the basic filesystem.
- > The kernel starts a program referred to as init with a method ID zero.
- > init sets the remainder of the system processes in motion.
- > For some purpose, init starts a method permitting you to log in, typically at the top or close to the top of the boot sequence.

List out types of display

- > LCD (Liquid Crystal Display)
- > IPS-LCD (In-Plane Switching Liquid Crystal Display)
- > OLED (Organic Light-Emitting Diode)
- > AMOLED (Active-Matrix Organic Light-Emitting Diode)

Q-36) What is printer? Add types of printers

- > A printer is a device that accepts text and graphic output from a computer and transfers the information to paper, usually to standard-size, 8.5" by 11" sheets of paper.

Types of printer

- > Laser Printer
- > Solid Ink Printer
- > LED Printer
- > Business Inkjet Printer
- > Home Inkjet Printer
- > Multifunction Printer
- > Dot Matrix Printer
- > 3D Printer

Q-37) Do a practical to install the printer

- > Make sure that the printer is turned off before connecting the USB cable.
- > Connect the printer end of the USB cable to the USB port on the side of ~~computer~~ printer.
- > Connect the other end of the USB cable to the USB port on the computer.
- > Turn on the printer by pressing the Power button.

Q-38) Do a practical to Troubleshoot the improper printing

- > Step 1:- Check to make sure the printer is turned on and connected to the same WiFi network as your device

Step 2:- Unplug and restart your printer

Step 3:- Set your printer as the default printer

Step 4:- clean the pointing device.

Step 5:- Reset the service that manages the pointing device

Step 6:- Remove and reinstall your pointer to your device

Step 7:- Restart your PC

Q-39) What are the parts of Laptop?

→ The parts of Laptop include display screen, keyboard, base panel, top panel, cooling fan, RAM, hard disk, palm rest assembly, battery, hinges, speaker, optical drive, antenna etc.

Q-40) Do a practical to disassemble the laptop.

→ Step 1:- Remove the power supply and battery

Step 2:- Remove the accessible components

Step 3:- Remove the Hinge Plate Cover (HPC) / Keyboard Bezel and keyboard

Step 4:- Remove any other cables under the keyboard that you see

Step 5:- Remove the display unit

Step 6! - Continue to remove any other screws from the case

Step 7! - Pry Case apart

Step 8! - Remove the motherboard and motherboard peripherals