**Module 1**

**[hardware and its components]**

**Topic: visible computer**

**1.what is hardware?**

**hardware is physical parts of computer,such as the case,cpu(central processing unit),**

**moniter,printer,mouse,keybord,hdd,graphics card,lancard,sound card,speakers and motherboard.**

**By contrast,software is the set of instrctions that can be stored and run by hardware.**

**2.what is the purpose of hardware?**

**hardware refers to the external and internal devices and equipment that enable you to perform major functions such as input,output storage,comunication,processing,and more.**

**1.List out two types of hardware?**

**there are two types of hardware like internal and external hardware.**

**external hardware: Devices are moniter,keyboard,and scanner,this are external hardware.**

**internal hardware:devices are includes motherboard,harddrive,and ram etc.**

**1.what is core harware?**

**A core is small CPU or processor built a bog CPU or CPU socket.**

**it can independently perform or process all**

**computational tasks.**

**From this perspective,we can consider a core to be smaller CPU or smaller processor whithin big processor.**

**2.Do a practical of identitify hardware?**

**done**

**topic :Category of components**

**1.what are catagory of components in hardware?**

**computer hardware includes the physical parts of a computer ,such as the case, central processing unit( cpu).random access memory, keyboard, computer data storage ,graphics card ,sound card, audio, speakers, motherboard etc.**

**2.why category needed?**

**category are cognitive and linguistic modals for applying prior knowladge; crating and using category enable us to relate thing to each other terms of similarity and dimalarity andare involved whenever we perceive ,comunicate, analyze, predict,**

**or classify.**

**1.do a practical to identify the components in which category they come.**

**Done.**

**Topic: output device**

**1.what is input device?**

**In computing, an input device is a place of equipment used to provide data and control signals to an information processing system, such as a computer or information processing system, such as a computer or information appliance.**

**Examples: keyboard, mouse, cpu.**

**2.why input device is needed?**

**Input devices are essential to the overall functionality of a computer because they allow users to add, edit, or feed a new set of data or instructions to the computer.**

**Input devices enable users to interact with the computer by either inputting numerals, characters, or gaming instructions into the computer.**

**1.list out input device?**

**.keyboard**

**.mouse**

**.Microphone.**

**.Scanner**

**.Barcode reader**

**2.do a practical to identify input device and describe how it work?**

**Done.**

**Topic: output device**

**1.what is output device?**

**An output device is any piece of computer hardware that converts information or data into a human-perceptible form or, historically, into a physical machine-readable form for use with other non-computerized equipment.it can be text, graphics, tactile, audio, or video.**

**2.how does work output device?**

**An output device is any hardware device used to send data from a computer to another device or user. Usually, most output peripherals are meant for human use, so they receive the processed data from the computer and transform it in the form of audio, video, or physical reproductions.**

**1.list out the output device?**

* **speakers**
* **GPS**
* **Headphones**
* **Monitor**
* **Optical mark reader(omr)**
* **Printer**

**2.do a practical to identify the output device and describe its working process?**

**Done.**

**Topic: motherboard**

**1.what is motherboard?**

**A motherboard is the main printed circuit board in general-purpose computers and other expandable systems. It holds and allows communication between many of the crucial electronic components of a system, such as the central processing unit and memory, and provides connectors for other peripherals.**

**2.why it is called motherboard?**

**Because it is the main circuit board. Much like the term mothership, the word motherboard signifies its essential nature. Additional circuit boards can be plugged into a motherboard, and these are known as daughterboards.**

**1.what it is called if we remove all components from the motherboard?**

**2.describe type of motherboard?**

* **Standard ATX motherboard**
* **Micro ATX motherboard**
* **extended ATX motherboard**
* **Flex ATX motherboard**
* **Low-Profile Extended (LPX) motherboard**
* **BTX motherboard**
* **Pico BTX motherboard**

**. Amd Ryzen**

**.Gigabyte.**

**1.do a practical by identify parts of motherboard.**

**done.**

**2.Do a practical by describing the data flow in motherboard**

**done.**

**3.Do a practical by removing all removable parts from the motherboard**

**done.**

**Topic: CPU**

**1.What is CPU?**

**A central processing unit also called a central processor or main processor is the most important processor in a given computer. Its electronic circuitry executes instructions of a computer program, such as arithmetic, logic, controlling, and input/output operations**

**2.write the full form of CPU?**

**CPU---CENTRAL PROCESSING UNIT**

**1.what are the type of CPU?**

* **INTEL CORE: i3, i5, i7 and i9. Starting in 2008, Intel released the Core i5 and i7 series and the i3 two years later**
* **INTEL PENTIUM: Pentium, Celeron and Xeon**
* **AMD: Athlon, Duron, Sempron, Opteron, Phenom, Ryzen**
* **Earlier Intel and AMD CPU**
* **Intel 286**
* **Intel 8088**

2.**What do we need to keep the CPU Healthy?**

* **Restart your computer at least once a week**
* **Hygiene your Programs**
* **Defrag your hard drive**
* **Investigate Startup programs**
* **Install Antivirus Software**
* **Use an Anti-Surge Protection Extensions**
* **Back-Up Your Files**

**1.do a practical to remove processor and apply thermal paste in it and install it again.**

**Done.**

**2.Do a practical to identify CPU its Sockets**

**Done.**

**Topic: Monitor**

**1.what is monitor?**

**A computer monitor is an output device that displays information in pictorial or textual form. A discrete monitor comprises a visual display, support electronics, power supply, housing, electrical connectors, and external user controls.**

**1.list out the types of monitor?**

* **LCD monitor**
* **LCD stands for Liquid crystal display and is the most widely used monitor in the world**
* **LED monitor. An LED (Light Emitting Diode) display is among the newest techs out there and can be flat or curved**
* **OLED monitor**
* **CRT monitor**
* **Plasma monitor**

**2.Do a practical to identify monitor technology.**

**Done.**

**3.What are the technologies used in monitor?**

**The display in modern monitors is typically an LCD with LED backlight, having by the 2010s replaced CCFL backlit LCDs. Before the mid-2000s, most monitors used a cathode-ray tube (CRT) as the image output technology. A monitor is typically connected to its host computer via DisplayPort, HDMI, USB-C, DVI, or VGA.**

**1.Describe does the CRT monitor works.**

**A CRT is a presentation screen that produces pictures as a video signal. It is a sort of vacuum tube that display pictures when electron beams from an electron gun strike a luminous surface. In other words, the CRT produces beams, accelerates them at high speed, and deflects them to make pictures on a phosphor screen.**

**Topic: System Bus**

**1.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.**

**1.list out types of system bus?**

**The three types of computer busses in the system bus are the Address Bus, the Data Bus, and the Control Bus.**

**2.Describe the Working of system bus?**

**The computer system bus is the method by which data is communicated between all the internal pieces of a computer. It connects the processor to the RAM, to the hard drive, to the video processor, to the I/O drives, and to all the other components of the computer.**

**3.Do a practical to identify the system bus?**

**Done.**

**Topic: Chipset**

**1.what is chipset?**

**In a computer system, a chipset is a set of**

**Electronic components on one or more integrated circuits that manages the data flow between the processor, memory and peripherals. The chipset is usually found on the motherboard of computers. Chipsets are usually designed to work with a specific family of microprocessors.**

**1.what are type of chipset?**

**As time went on, chip functionality consolidated into two main chipsets, the faster northbridge that connects directly to the CPU and memory, and the slower southbridge.**

**2.which chipset does have direct connect with CPU?**

**Northbridge is directly connect with CPU.**

**3.Do a practical to identify chipset?**

**Done.**

**1.Discribe how does the northbridge work?**

**The northbridge handles the high-speed communication between the CPU, memory, and graphics card, while the southbridge manages the slower input/output operations and connects devices like hard drives , universal serial bus devices, and audio interfaces.**

**Topic: Memory**

**1.what is memory?**

**Memory is the faculty of the mind by which data or information is encoded, stored, and retrieved when needed. It is the retention of information over time for the purpose of influencing future action.**

**2.what are the type of memory?**

* **Short-term memory. Short-term memory stores information temporarily, and then the brain releases it or transfers it to long-term memory storage**
* **Long-term memory**
* **Explicit memory**
* **Episodic memory**
* **Semantic memory**
* **Implicit memory**
* **Working memory**
* **Visual-spatial memory**

**1.What is memory in detail?**

**Memory is the process of taking in information from the world around us, processing it, storing it and later recalling that information, sometimes many years later. Human memory is often likened to that of a computer memory system or a filing cabinet.**

**2.what are memory types.**

**The four general types of memories are sensory memory, short-term memory, working memory, and long-term memory.**

**1.Do a practical to identify memory type.**

**Done.**

**2.Do a practical to install memories in system?**

**Done.**

**3.Do a practical to identify main memory frequencies.**

**Done.**

**Topic: System UNIT**

**1.What is System Unit?**

**A system unit, in the context of computing, refers to the main part of a personal computer. It's typically a rectangular box that contains important parts like the motherboard, central processing unit (CPU), random access memory (RAM), and storage drives.**

**1.how does system unit work?**

**The primary function of the computer system unit is to hold all the other components together and protect the sensitive electronic parts from the outside elements. A typical computer case is also large enough to allow for upgrades, such as adding a second hard drive or a higher-quality video card.**

**2.what are the components of system unity?**

* **Motherboard - the primary device of the system unit**
* **Processor is an incredibly complex chip that performs billions of mathematical calculations per second**
* **RAM (Random Access Memory) - system memory.**

**1.Do a practical to identify system unit**

**Done.**

**2.Do a practical to assemble and disassemble system unit.**

**Done.**

**Topic: BIOS**

**1.What is BIOS?**

**In computing, BIOS is firmware used to provide runtime services for operating systems and programs and to perform hardware initialization during the booting process.**

**1.what is the full form of BIOS?**

**BIOS: Basic Input Output System**

**2.Describe Working process of 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 also manages data flow between the computer's operating system and attached devices, such as the hard disk, video adapter, keyboard, mouse and printer.**

**1.Do a practical to reset bios when system is on?**

**Done.**

**2.Do a practical of hard resetting the bios?**

**Done.**

**3.Do the practical of identify Bios chip from the motherboard?**

**Done.**

**Topic: CMOS**

**1.what is cmos?**

**CMOS stands for Complementary Metal-Oxide-Semiconductor. It is a type of technology used in the manufacturing of computer processors, memory chips, and other digital devices.**

**2.what is the full form of CMOS?**

**The full form of CMOS is Complementary Metal-Oxide-Semiconductor.**

**3.Describe the working process of CMOS?**

**In CMOS logic gates, we use a complementary structure in which one transistor acts as a load to the other transistor. The NMOS transistors are designed to work as positive logic elements, while PMOS works as negative logic elements. It means that both the transistors in a CMOS perform complementary logic functions.**

**1.do a practical of identifying CMOS?**

DONE

**2.do a practical to installing CMOS?**

**DONE  
3.how do we know that CMOS is not working?**

**The most common symptom of CMOS battery failure is incorrect or slow system date and time in the BIOS, loss of BIOS settings when the computer is powered off, time-of-day clock stopped error message and so on. If the CMOS battery is out of charge, the BIOS settings will be lost when the computer is powered off.**

**TOPIC: Boot Process**

**1.What is Boot process?**

**In computing, booting is the process of starting a computer as 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.**

**2.What is the first process of Boot?**

**Booting Process in Operating System. Step 1: Once the computer system is turned on, BIOS (Basic Input /Output System) performs a series of activities or functionality tests on programs stored in ROM, called on POST (Power-on Self Test) that checks to see whether peripherals in the system are in perfect order or not.**

**2.What is the final stage of boot process?**

**Answer and Explanation: At the later stages of the boot sequence, the operating system is loaded from the hard disk to the primary memory (RAM) to perform necessary tasks. Then, at the last stage, full control of hardware and machine is granted to the OS so that it can look after all the operations.**

**3.Describe the boot process in linux?**

**During boot-up, the boot loader (such as GRUB) loads the Linux kernel into memory. The kernel then decompresses itself and, if configured to use an initrd, loads the initrd image as a temporary root file system into a predetermined memory location.**

**1.describe about working with the grub bootloader?**

**GRUB (also known as GNU GRUB or GNU Grand Unified Bootloader) is a bootloader and boot manager for Linux and other Unix-based OSes. GRUB starts after BIOS finishes the necessary hardware tests and loads it from the Master Boot Record (MBR). Once loaded, GRUB takes control of the system and loads the Linux kernel.**

**2.describe the working process of boot loader?**

**The bootloader mainly works in initializing OBC hardware, receiving boot commands from the ground, and making the operating system and application of the OBC run well. The bootloader is solidified on the PROM of the satellite and is important for OBC applications.**

**TOPIC: SMPS**

**1.What is SMPS?**

**A switched-mode power supply, also called switching-mode power supply, switch-mode power supply, switched power supply, or simply switcher, is an electronic power supply that incorporates a switching regulator to convert electrical power efficiently.**

**2.What is the process of SMPS?**

**Generally speaking, an SMPS uses an input filter and a rectifier to first convert the ac power supply voltage into a dc voltage. After that, a chopper “chops up” the dc voltage so that the transformer primary winding's input can produce a voltage made up of several square-wave high-frequency pulse (20 kHz–10 MHz).**

**1.Do a practical to install SMPS?**

**DONE**

**2.How many sata connector in normal SMPS?**

**A typical SMPS (Switched Mode Power Supply) used in computers does not have SATA connectors directly on it. SATA (Serial ATA) connectors are typically found on the power supply cables that come from the power supply unit (PSU). A standard power supply for a desktop computer usually includes multiple SATA power connectors.**

**1.Do a practical to troubleshoot a SMPS without plugging it to the system?**

**DONE**

**2.how many pin does atx connector have?**

**The ATX (Advanced Technology extended) power supply connector used in desktop computers typically has 20 or 24 pins. The original ATX standard used a 20-pin connector, while later versions, known as ATX12V 2.x, introduced a 24-pin connector to provide additional power for newer components and features.**

**TOPIC: RAM**

**1.What is RAM?**

**Random-access memory is a form of electronic computer memory that can be read and changed in any order, typically used to store working data and machine code.**

**2.What is the full form of ram?**

**RAM: Random Access Memory**

**1.What are the type of RAM?**

**What are the types of RAM? There are two main types of RAM: Dynamic RAM (DRAM) and Static RAM (SRAM). DRAM (pronounced DEE-RAM), is widely used as a computer's main memory. Each DRAM memory cell is made up of a transistor and a capacitor within an integrated circuit, and a data bit is stored in the capacitor.**

**2.Do a practical to identify RAM?**

**DONE**

**1.Do a practical to identify ram install in a proper system?**

**DONE**

**TOPIC: Device and Cable**

**1.What are the type of device?**

**Computing devices: This category includes computers, laptops, tablets, smartphones, and other devices that are used for processing and storing data. Consumer electronics: This category includes devices such as televisions, DVD players, gaming consoles, and home theater systems.**

**2.What are the type of Cable?**

**Cables can be classified into various categories, depending on their different uses and structures. Some types are coaxial cables, twisted pairs, optical fibers, patch cables, power cables, data cables, etc.**

**1.What cables are used to connect printer?**

**A USB cable connects your printer to your computer, so you have a direct connection every time you print. The majority of printers are compatible with a USB 2.0 A/B cable. The "A" side of the cable plugs into the USB port on your computer and the "B" side plugs into the back of the printer.**

**2.what was the first cable founded by apple for data transfer?**

**FireWire. Apple started including FireWire on the Power Macintosh in early 1999, replacing the SCSI connections users relied on for years to transfer data at high speeds for external hard disk drives and multimedia hardware like scanners.**

**1.Do a practical to identify the data cables?**

**DONE**

**2.Do a practical to identify and install the cables in the system?**

**DONE**

**TOPIC: Expansion slot and cards**

**1.Why expansion card needed?**

**The primary purpose of an expansion card is to provide or expand on features not offered by the motherboard. For example, the original IBM PC did not have on-board graphics or hard drive capability.**

**2.why expansion slot is needed?**

**An expansion slot is a socket on a computer motherboard that allows you to add additional components to your system. These slots are used to expand the capabilities of your computer and can be used to add new functionality to your system.**

**1.What are the type of Expansion card?  
There are a plethora of expansion cards available. These include: sound, video, serial and parallel, USB, FireWire, storage, modem, wireless/cellular, TV tuner, and video capture cards.**

**2.What are the type of expansion slots.**

**Some common types of expansion slots include peripheral component interconnect (PCI), PCI express (PCIe), accelerated graphics port (AGP), and industry standard architecture (ISA).**

**Pci**

**Pci express /1**

**Pci expree/16**

**1.DO a practical to identify the types of expansion slots?**

**DONE**

**2.Do a practical to install the graphics card?**

**DONE**

**3.Do a practical to install LAN card?**

**DONE**

**TOPIC: I/o ports**

**1.What is I/O ports?**

**A computer port is a hardware piece on a computer where an electrical connector can be plugged to link the device to external devices, such as another computer, a peripheral device or network equipment.**

**2.list out the I/o ports available?**

**Internal Port: It connects the system's motherboard to internal devices like hard disk, CD drive, internal Bluetooth, etc. External Port: It connects the system's motherboard to external devices like a mouse, printer, USB, etc.**

**3.Do a practical to identify the I/o ports?**

**DONE**

**TOPIC: BIOS & CMOS**

**1.What is BIOS?**

**In computing, BIOS is firmware used to provide runtime services for operating systems and programs and to perform hardware initialization during the booting process.**

**2.what is CMOS?**

**Complementary metal–oxide–semiconductor is a type of metal–oxide–semiconductor field-effect transistor fabrication process that uses complementary and symmetrical pairs of p-type and n-type MOSFETs for logic functions.**

**1.What is role of BIOS in I/O?**

**BIOS (basic input/output system) 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 (OS) and attached devices, such as the hard disk, video adapter, keyboard, mouse and printer.**

**2.What is the role I/o in CMOS?**

**I/O (Input/Output) is an information processing system designed to send and receive data from a computer hardware component, device, or network. Data can be sent between devices over a network. Without I/O, computers would not be able to communicate to other systems or devices.**

**1.Do a practical to reset BIOS?**

**DONE**

**2.Do a practical to remove CMOS?**

**DONE**

**TOPIC: laptop & storage**

**1.What is Laptop?**

**A laptop computer or notebook computer, also known as a laptop or notebook, is a small, portable personal computer**

**2.What is storage?**

**Storage is a process through which digital data is saved within a data storage device by means of computing technology. Storage is a mechanism that enables a computer to retain data, either temporarily or permanently.**

**3.list out the type of storage?**

**The most prevalent forms of data storage are file storage, block storage, and object storage, with each being ideal for different purposes.**

**1.Do a practical to identify types of storage?**

**DONE**

**2.Do a practical to disassemble and assemble the storage?**

**DONE**

**3.DO a practical to install the storage devices.**

**DONE**

**TOPIC: printer**

**1.What is printer?**

**A printer is a device that prints documents and images onto paper or other materials. It is usually connected to a computer, allowing you to use your word processor, spreadsheets, and other programs to create documents and images that are printed out on the printer.**

**2.Why the printer needed?**

**In general, the printer is a hardware device that is used to get a hard copy of a document or a file. It can be used for: getting the printout of important documents. to prepare projects in schools or colleges.**

**1.Describe the working process of printer?**

**A printer works by sending electronic signals from the computer to the printer's control board. The control board then interprets these signals into instructions for the print head or toner cartridge.**

**2.What are the type of printer?**

**tested: inkjet printers, laser printers, solid ink printers, continuous ink printers, LED printers, dot matrix printers and A3 printers.**

**1.do a practical to install the printer?**

**DONE**

**2.do a practical to troubleshoot improper printing?**

**DONE**

**1.Do a practical to remove storage devices and reinstall it and make it gpt disk?**

**DONE**

**TOPIC: ATA**

**1.What is ATA?**

**An analog telephone adapter (ATA) is a device used to connect an analog telephone, fax machine or similar equipment to a computer or network to enable communications over the internet. ATAs let users talk on their telephones like they do when connected to a traditional telephone network.**

**2.Describe working of ATA?**

**Advanced Technology Attachment (ATA) is a standard physical interface for connecting storage devices within a computer. ATA allows hard disks and CD-ROMs to be internally connected to the motherboard and perform basic input/output functions.**

**1.Do a practical of identifying and install ATA cables?**

**DONE**

**TOPIC: SATA**

**1.What is SATA?**

**SATA is a computer bus interface that connects host bus adapters to mass storage devices such as hard disk drives, optical drives, and solid-state drives. Serial ATA succeeded the earlier Parallel ATA standard to become the predominant interface for storage devices.**

**1.Describe the working of SATA?**

**Serial ATA (Serial Advanced Technology Attachment or SATA) 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), optical drives and solid-state drives (SSDs).**

**2.Do a practical to identify SATA?**

**DONE**

**3.Do a practical to install SATA?**

**DONE**

**4.Whare does SATA is used?**

**Data is commonly used in scientific research, economics, and in virtually every other form of human organizational activity. Examples of data sets include price indices (such as consumer price index), unemployment rates, literacy rates, and census data.**

**TOPIC: SCSI**

**1.What is SCSI?**

**Small Computer System Interface is a set of standards for physically connecting and transferring data between computers and peripheral devices, best known for its use with storage devices such as hard disk drives.**

**2.Why SCSI needed?**

**SCSI (Small Computer System Interface) is used to connect and communicate between computers and peripheral devices, such as hard disk drives, tape drives, CD/DVD drives, and scanners. SCSI was originally developed as both a protocol and a parallel physical interface.**

**1.What is the rpm if SCSI?**

**SCSI Hard Drive 80-Pin 10K 15k RPM Ultra320, For Server, Size: 3.5.**

**2.Do a practical to install SCSI?**

**DONE**

**TOPIC: LAPTOP**

**1.What is laptop?**

**A laptop computer or notebook computer, also known as a laptop or notebook, is a small, portable personal computer.**

**2.What are type of laptop?**

**Notebook**

**Chromebook**

**Netbook**

**Ultrabook**

**MacBook Air**

**Graphics**

**Gaming**

**2.differnet type of laptop name?**

**Hp**

**Dell**

**Vivo book**

**Acer**

**Mac book**

**Graphics**

**1.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. Introduction: As we know laptop is most common computing device used around the world due to its portable nature.**

**2.Do a practical of identifying part of laptop?**

**DONE**

**1.DO a practical to disassemble the laptop?**

**DONE**

**2.Do a practical to change the ram in the laptop?**

**DONE**

**TOPIC: PRINTER**

**1.What is printer?**

**In the field of computing, a printer is considered a peripheral device that serves the purpose of creating a permanent representation of text or graphics, usually on paper.**

**2.is it input device or output device?**

**Input devices are controlled by the users. Output devices are controlled by computers. Mouse, Keyboards etc., are input device examples. Monitors, Printers etc., are examples of output devices.**

**1.Describe the types of printer?**

**1.laser printer**

**2.dot matrix printer**

**3.line printer**

**4.drum printer**

**5.lpt printer**

**6.wifi printer**

**7.network printer**

**8.inkjet printer**

**2.describe inkjet printer?**

**An inkjet printer is a computer peripheral that produces hard copies of a text document or photo by spraying droplets of ink onto paper. A typical inkjet printer can produce color printing copies with a resolution of 1200 x 1440 dpi.**

**1.Do a practical of network installation of the printer?**

**DONE**

**2DO a practical to troubleshoot of no cartridge error?**

**DONE**