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HARDWARE (ICT) CLASS – 4TH

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DOEACC QUALITY ASSURANCE IN COMPUTER EDUCATION

LAST CLASS : PARTS OF THE REAR PANEL

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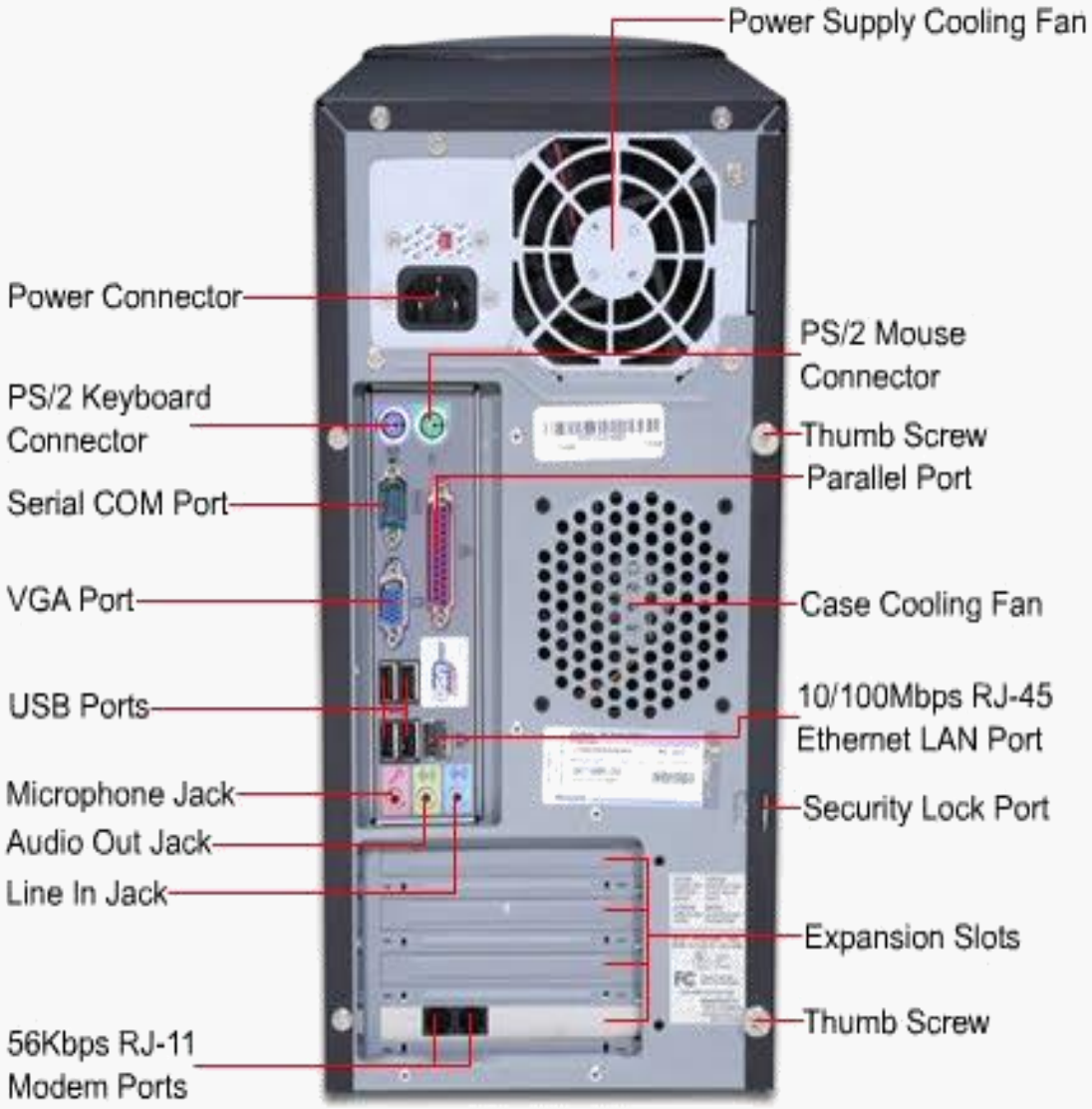

REAR PANEL PORTS & SLOTS

1. Power Supply Cooling Fan –
2. Power Connector –
3. PS2 Port –
4. Serial Port
5. Parallel Port –
6. VGA Port –
7. USB Port –
8. Firewire port
9. Ethernet Lan Port (RJ45 Port) –
10. Microphone/Audio Port –
11. Expansion Slots – (Graphic Card / Sound Card / Midi Port /Game Port /Modem Port / Etc.)

INSIDE THE SYSTEM UNIT

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System unit (chassis) is a set of electronic components of a computer that provides the proper its operating. There are Twelve main system unit components :

- **Motherboard**
- **Processor**
- **RAM/ Memory stick**
- **Optical Drive**
- **Hard Drive.**
- **Heat Sink with CPU Fan -**
- **Floppy Drive / Zip Drive**
- **System Fan**
- **Power Supply**
- **ROM –**
- **Video Card -**
- **Expansion Card (Daughter Board)-**

INSIDE THE SYSTEM UNIT (MOTHERBOARD)

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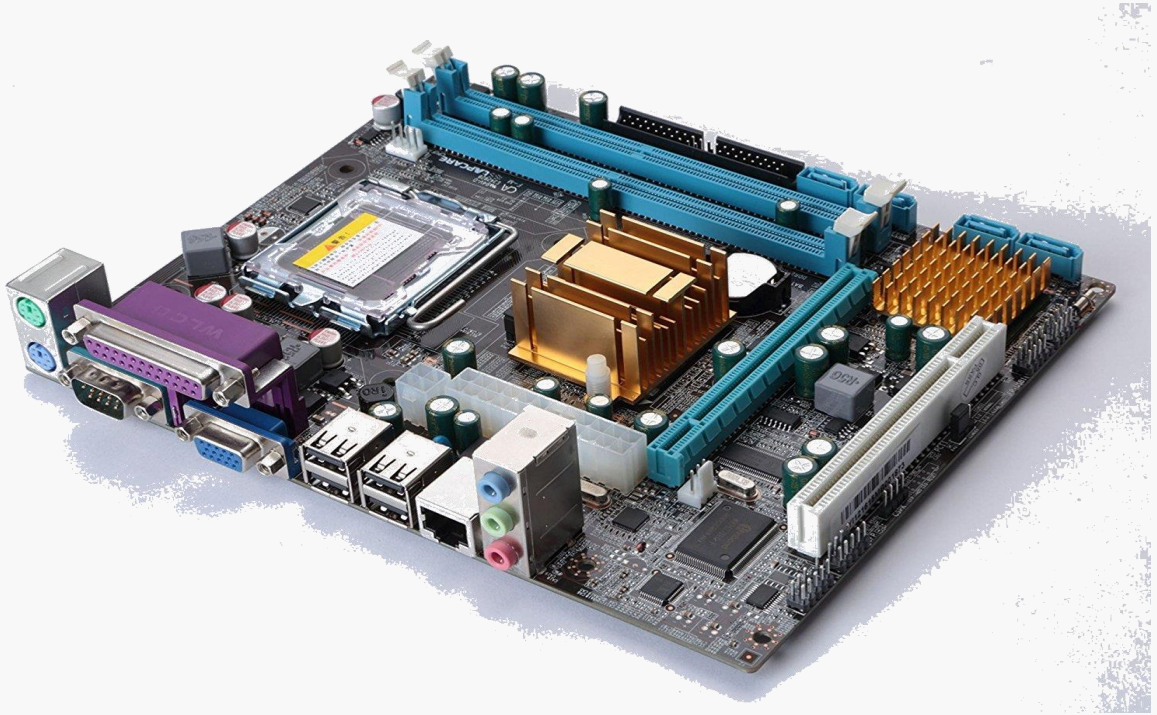
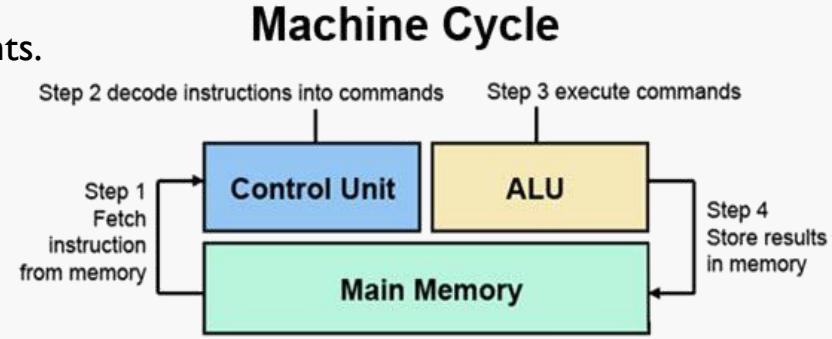
- **Motherboard** The motherboard is the main circuit board of your computer and is also known as the mainboard or system board or baseboard or planar board or logic board. If you ever open your computer, the biggest piece of silicon you see is the motherboard.
- Attached to the motherboard, you'll find the CPU, ROM, memory RAM expansion slots, PCI slots, and USB ports. It also includes controllers for devices like the hard drive, DVD drive, keyboard, and mouse. Basically, the motherboard is what makes everything in your computer work together. Motherboard contains special chips on which some ICs (Integrated circuits) are attached.
- The first motherboard (then called a planar or a "breadboard") was invented by IBM and sold on its first personal computer (PC) in 1981.



INSIDE THE SYSTEM UNIT (PROCESSOR)

- **Processor** – A computer engine, its brain. CPU (central processing unit) manages most of computer operations. Processors can be with pins or pin-less. CPU also called a central processor or main processor, is the electronic circuitry within a computer that executes instructions that make up a computer program. The CPU performs basic arithmetic, logic, controlling, and input/output (I/O) operations specified by the instructions in the program. The computer industry used the term "central processing unit" as early as 1955.

- **Components of the CPU -** In the CPU, there are three primary components.
  - ALU (Arithmetic Logic Unit) - performs mathematical, logical, and decision operations.
  - CU (Control unit) - directs all the processors operations.
  - MU (Memory Unit) - where the data is stored and is accessible to CPU.



- Over the history of computer processors, the speed (clock speed) and capabilities of the processor have dramatically improved. For example, the first microprocessor was the Intel 4004 that was released on November 15, 1971, and had 2,300 transistors and performed 60,000 operations per second. The Intel Pentium processor has 3,300,000 transistors and performs around 188,000,000 instructions per second.

INSIDE THE SYSTEM UNIT (PROCESSOR)

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The World's Top Semiconductor Companies

1. Samsung
2. Intel
3. Taiwan Semiconductor
4. SK Hynix
5. Micron Technology
6. Broadcom
7. Qualcomm
8. Texas Instruments
9. Toshiba
10. Nvidia
11. AMD

Intel Processors

4004 8080 8086 8087 8088 80286 (286) 80386 (386) 80486 (486)	Pentium Pentium w/ MMX Pentium Pro Pentium II Celeron Pentium III Pentium M Celeron M	Pentium 4 Mobile Pentium 4-M Pentium D	Pentium Extreme Edition Core Duo Core 2 Duo	Core i3 Core i5 Core i7 Core i9

AMD (Advanced Micro Devices) Processors

K6-2 K6-III Athlon Duron Athlon XP	Sempron Athlon 64 Mobile Athlon 64 Athlon XP-M Athlon 64 FX	Turion 64 Athlon 64 X2 Turion 64 X2 Phenom FX Phenom X4	Phenom X3 Athlon 6-series Athlon 4-series Athlon X2 Phenom II	Athlon II E2 series A4 series A6 series A8 series A10 series

INSIDE THE SYSTEM UNIT (HARD DRIVE)

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- **RAM** (Random Access Memory) – RAM is one of the most fundamental elements of computing. Random access memory (RAM) is a computer's short-term, super-fast, primarily and temporary data storage space that a computer needs to access right now or in the next few moments. None of your programs, files, or Netflix streams would work without RAM, which is your computer's working space. There are dynamic and static RAMs.

- **Hard Drive** – A hard disk drive (sometimes abbreviated as a hard drive, HD, or HDD) is a non-volatile data storage device. It is usually installed internally in a computer, attached directly to the disk controller of the computer's motherboard. Here all our files, folders, operating system, programs, and applications are saved. Hard driver can be of two type: PATA (Parallel Attachment Packet Interface) and SATA (Serial Attachment Packet Interface).

- **Solid-State Drive (SSD) -** is a new generation of storage device used in computers. SSDs replace traditional mechanical hard disks by using flash-based memory, which is significantly faster. Older hard-disk storage technologies run slower, which often makes your computer run slower than it should. SSDs speed up computers significantly due to their low read-access times and fast throughputs.

INSIDE THE SYSTEM UNIT (HARD DRIVE)

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Attribute	SSD (Solid State Drive)	HDD (Hard Disk Drive)
Power Draw / Battery Life	Less power draw, averages 2 – 3 watts, resulting in 30+ minute battery boost	More power draw, averages 6 – 7 watts and therefore uses more battery
Cost	Expensive, roughly $0.20 per gigabyte (based on buying a 1TB drive)	Only around $0.03 per gigabyte, very cheap (buying a 4TB model)
Capacity	Typically not larger than 1TB for notebook size drives; 4TB max for desktops	Typically around 500GB and 2TB maximum for notebook size drives; 10TB max for desktops
Operating System Boot Time	Around 10-13 seconds average bootup time	Around 30-40 seconds average bootup time
Noise	There are no moving parts and as such no sound	Audible clicks and spinning can be heard
Vibration	No vibration as there are no moving parts	The spinning of the platters can sometimes result in vibration
Heat Produced	Lower power draw and no moving parts so little heat is produced	HDD doesn't produce much heat, but it will have a measurable amount more heat than an SSD due to moving parts and higher power draw
Failure Rate	Mean time between failure rate of 2.0 million hours	Mean time between failure rate of 1.5 million hours
File Copy / Write Speed	Generally above 200 MB/s and up to 550 MB/s for cutting edge drives	The range can be anywhere from 50 – 120MB / s
Encryption	Full Disk Encryption (FDE) Supported on some models	Full Disk Encryption (FDE) Supported on some models
File Opening Speed	Up to 30% faster than HDD	Slower than SSD
Magnetism Affected?	An SSD is safe from any effects of magnetism	Magnets can erase data

INSIDE THE SYSTEM UNIT (HEAT SINK & FLOPPY DRIVE)

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- **Heat Sink with CPU Fan** – A heat sink is a component that increases the heat flow away from a hot device. It accomplishes this task by increasing the device's working surface area and the amount of low-temperature fluid that moves across its enlarged surface area. Based on each device's configuration, we find a multitude of heat sink aesthetics, design, and ultimate capabilities.

- A computer fan is any fan inside, or attached to, a computer case used for active cooling. Fans are used to draw cooler air into the case from the outside, expel warm air from inside and move air across a heat sink to cool a particular component.

- **FLOPPY DRIVE :** a device which allows a computer to read from and write on to floppy disks. A floppy disk drive (FDD), or floppy drive, is a hardware device that reads data storage information. It was invented in 1967 by a team at IBM and was one of the first types of hardware storage that could read/write a portable device. IBM first introduced it as a 8-in diskette in 1971. In the middle of 1970s, a 5.25 diskette was introduced. Today, the most commonly used floppy disks are 3.5 inches and have the capacity of 800 KB to 2.8 MB (with a standard of 1.44 MB).

INSIDE THE SYSTEM UNIT (POWER SUPPLY & CPU FAN)

- **Power Supply (SMPS) -** Switch Mode Power Supply or simply SMPS is a type of Power Supply Unit (PSU) that uses some kind of switching devices to transfer electrical energy from source to load. Usually the source is either AC or DC and the load is DC.
- The most common application of an SMPS is the power supply unit of a computer. Switching Mode Power Supply (SMPS) has become a standard type of power supply unit for electronic devices because of their high efficiency, low cost and high power density.

- **Power Supply Cooling Fan (CPU fan)** - a fan located on top of a computer processor. Helps to pull and blow hot air off the processor, helping keep it cooler. Power supply fan - a fan located inside a power supply. The power supply fan blows hotter air out of the power supply and out of the computer

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INSIDE THE SYSTEM UNIT (ROM & CARD)

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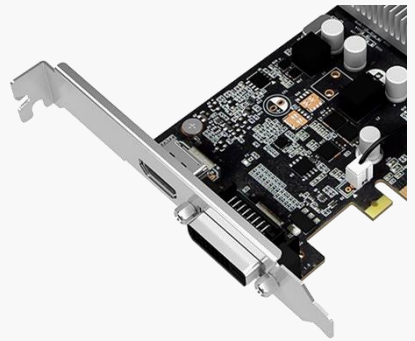
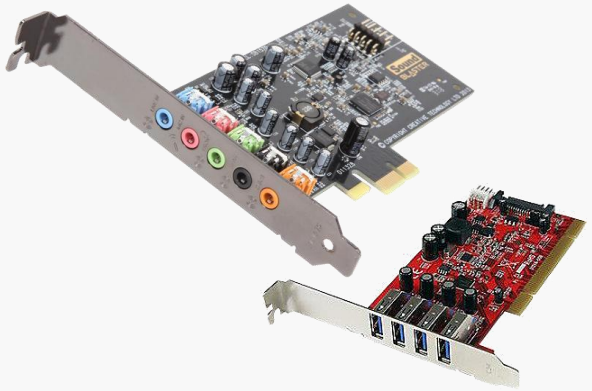
- **ROM** – ROM is an acronym for Read-Only Memory. It refers to computer memory chips containing permanent or semi-permanent data. Unlike RAM, ROM is non-volatile; even after you turn off your computer, the contents of ROM will remain. Almost every computer comes with a small amount of ROM containing the boot firmware

- **Video Card (Graphics Adapter)** – with its help the outputs from a computer are displayed on the screen. Modern video cards support HDMI (high-definition multimedia interface), VGA (video graphics array) and DVI (digital visual interface).



- **Expansion Card (Daughter Board)–** Alternatively known as a **bus slot** or **expansion port**, an **expansion slot** is a connection or port inside a computer on the motherboard or riser card. It provides an installation point for a hardware expansion card to be connected. For example, if you wanted to install a new video card in the computer, you'd purchase a video expansion card and install that card into the compatible expansion slot. List of Expansion card is Interface card (ATA, Bluetooth, EIDE, FireWire, IDE, parallel, RAID, SCSI, serial, and USB),Modem,MPEG Decoder, Network Card, Sound Card,Video capture card,Video Card.



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NEXT CLASS (IPO CYCLING)