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UNIT - I

BASICS OF COMPUTER

**Introduction to Computer:****What is Computer - கணினி என்றால் என்ன?**

Computer is an electronic device that is designed to work with Information.

Today's computers are electronic devices that accept data (input), process that data, produce output, and store (storage) the results.

It represents the decimal numbers through a string of binary digits (0 and 1 Only Store in Hard Disk).

Computer cannot do anything without a Program

கணினி என்பது தகவல்களுடன் வேலை செய்ய வடிவமைக்கப்பட்ட ஒரு மின்னணு சாதனமாகும்.

இன்றைய கணினிகள் தரவுகளை (உள்ளீடு), அந்தத் தரவைச் செயலாக்கி, வெளியீட்டை உருவாக்கி, முடிவுகளைச் சேமிக்கும் (சேமித்து வைக்கும்) மின்னணுச் சாதனங்களாகும்.

இது பைனரி இலக்கங்களின் சரம் மூலம் தசம எண்களைக் குறிக்கிறது (Harddisk-ல் 0 மற்றும் 1 மட்டும் சேமிக்கவும்).

நிரல் (program) இல்லாமல் கணினியால் எதையும் செய்ய முடியாது

History of Computer - கணினியின் வரலாறு?

Name of Device	Year of Invention	Name of the Inventor
Abacus	5000 Years ago	Ancient Babylonians
Slide Rule	1620	William Ought red
Arithmetic Engine	1642	Blaise Pascal
Difference Engine	1822	Charles Babbage
Analytical Engine	1833	

First Calculates Method Used Finger Counting

Charles Babbage : Was considered to be the father of computing.

Ada Lovelace : First computer programmer, 1840

John Von Neumann : Was a Hungarian Mathematician. He introduced the concept of Stored program.

Generations of Computers - கணிப்பொறிகளின் தலைமுறைகள்?

Generation	Compound Used	Period
First Generation	vacuum tube or thermionic valve machine	1940 to 1956
Second Generation	Transistor Technology	1956 to 1963
Third Generation	Integrated Circuit (IC)	1963 to 1971
Fourth Generation	Microprocessor Technology.	1972 to 2010
Fifth Generation	Artificial intelligence, Quantum computation, Nanotechnology, Parallel processing, etc.	2010 to Till

Application of computer - கணிப்பொறிகளின் பயன்பாடு?

Home	வீடு
Medical Field	மருத்துவத் துறை
Entertainment	பொழுதுபோக்கு
Industry	தொழில்
Education	கல்வி
Government	அரசு
Banking	வங்கி
Business	வணிகம்

Advantages of Computer - கணினியின் நன்மைகள்?

Stores huge amount of data	பெரிய அளவிலான டேட்டாவைச் சேமிக்கிறது
Accuracy	துல்லியம்
Increases your productivity.	உங்கள் உற்பத்தித்திறனை அதிகரிக்கிறது.
Internet connection.	இணைய இணைப்பு.
Organizes the information.	தகவலை ஒழுங்கமைக்கிறது.
Keeps everyone connected.	அனைவரையும் இணைக்கிறது.
Helps to automate.	தானியங்கு செய்ய உதவுகிறது
Help physically challenged.	உடல் ஊனமுற்றோருக்கு உதவுங்கள்

Terms related to Computer

Characteristics of Computer - கணினியின் பண்புகள்?

✓ Speed	வேகம்
✓ Storage	சேமிப்பு
✓ Versatility	பல்துறை
✓ Diligence	விடாமுயற்சி - தொடர்ந்து வேலை செய்யும்.

Speed - வேகம்

A computer works with much higher speed and accuracy compared to humans while performing mathematical calculations. Computers can process millions (1,000,000) of instructions per second. The time taken by computers for their operations is microseconds and nanoseconds.

Storage - சேமிப்பு

A computer has built-in memory called primary memory where it stores data. Secondary storage are removable devices such as CDs, pen drives, etc., which are also used to store data.

Diligence - பல்துறை

A computer can perform millions of tasks or calculations with the same consistency and accuracy. It doesn't feel any fatigue or lack of concentration. Its memory also makes it superior to that of human beings.

Versatility – விடாமுயற்சி- தொடர்ந்து வேலை செய்யும்.

Versatility refers to the capability of a computer to perform different kinds of works with same accuracy and efficiency

Hardware

These computer science terms connect to the physical components of a computer. Hardware represents the most tactile aspects of computer science and the materials computers are made of.

Software

The physical components of devices are only the tip of the iceberg. Much of the computer science field focuses on software applications and their development.

Algorithm

At a basic level, algorithms are simply specific procedures used to solve computational problems. As computing power and data capabilities have grown more sophisticated, so have the algorithms and the problems they intend to solve. For example, a shipping company may turn to an algorithm to help determine the optimal route for delivery drivers.

API (Application Programming Interface)

An API is a software go-between that brings information from one application to another. It allows applications to communicate with one another while preserving some security measures for each end point. For example, an API can be used to securely transfer data stored by your web browser to a mobile app.

Boolean

A function in programming with binary choices, like —Yes or No and —True or False. This serves as a basic building block of programming logic.

Bug

A bug is a programming error that causes unexpected glitches or problems for a program's end user. Debugging is the process of identifying, documenting and fixing the issues caused by bugs.

Code

Code refers to the string of commands or directions used by different programming languages in order to create, edit or manage computer programs or applications. Code is used by computers to determine which action should be taken, define parameters and more.

Compiling

The process of taking code that's written in a high-level language (like C++) by human developers and translating it into machine-readable code.

Scripts

Similar in a way to the scripts used by Hollywood stars, a script in programming terms is a line by line set of instructions for a computer program to follow. These are often used for automation or for generating dynamic page content.

Cloud storage

Cloud storage is an alternative to storing data on a computer's physical storage. Information stored on the cloud is kept on remote servers that can be accessed anywhere via the Internet.

Cyber security

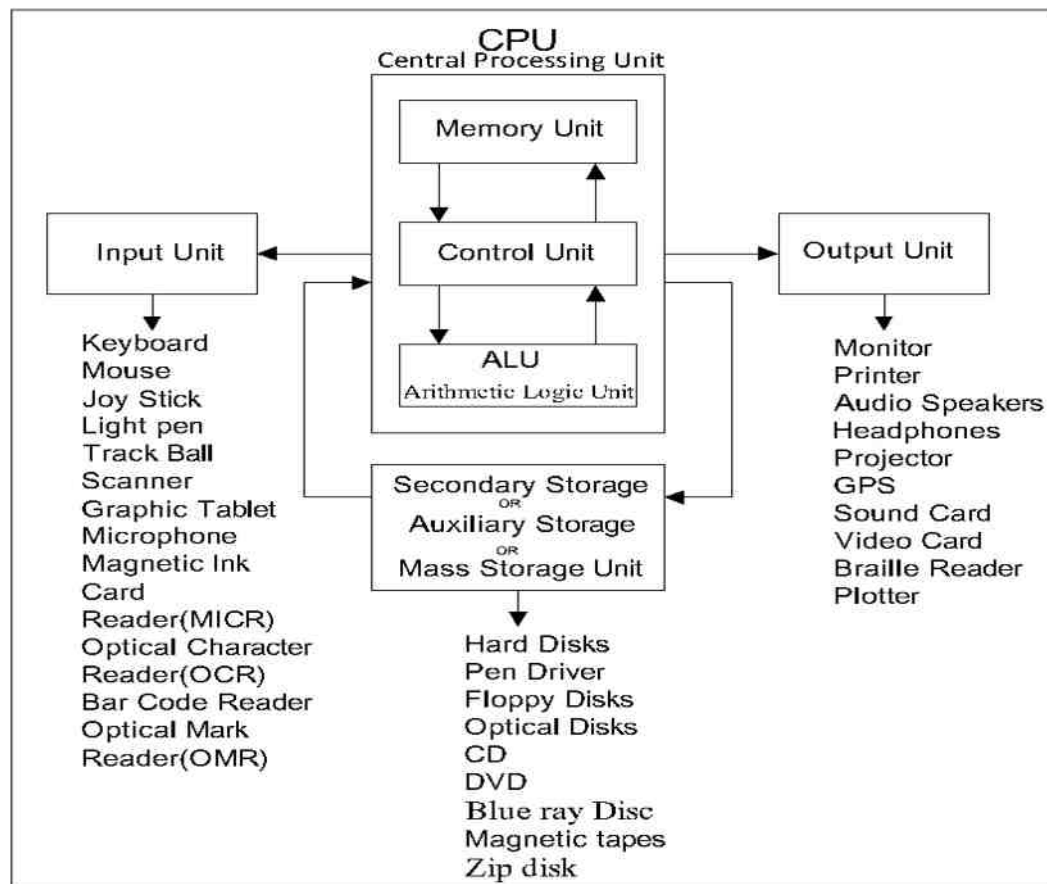
Cyber security is the process of protecting data from unauthorized users or hackers. It also represents a huge sector of the tech industry as more and more companies race to stay ahead of cyber criminals and security threats.

Different between Hardware and Software

Hardware	Software
Hardware is further divided into four main categories: Input Devices Output Devices	Software is further divided into Three main categories: 1.Application Software (Ms-Office, Open Office, etc.) 2. System Software (OS) (Winnows, Linux)

Hardware	Software
Secondary Storage Devices Internal Components	3. Computer Language (Java, C & C++, Python, etc)
Developed using electronic and other Materials	Developed writing using instructions using a programming language
When damaged, it can be replaced with a new component	When damaged it can be installed once more using a backup copy
Hardware is physical in nature and hence one can touch and see hardware	The software cannot be physically touched but still can be used and seen
Hardware cannot be infected by Viruses	The software can be infected by Viruses
Hardware will physically wear out over Time	Software does not wear out but it can be affected by bugs and glitches
An example of Hardware is hard drives, monitors, CPU, scanners, printers etc.	An example of software is Windows 10 , MS Office, Adobe Photoshop, Google Chrome etc

Block Diagram and Working Principle of Computer? (அவசியம் படிக்கவும்)



Input

An input device is any hardware device that sends data to a computer, allowing you to interact with and control it. The picture shows a Logitech trackball mouse, an example of an input device.

The keyboard and mouse are the most commonly used or primary input devices on a computer. However, other devices also input data into a computer.

CPU-Central Processing Unit

CPU- It is the Main part of a computer system. It Controls and processes the information. It is often called the "**Brains**" of the Computer.

A processor's speed is measured in megahertz (**MHz**), or millions of instructions per second; and gigahertz (**GHz**), or billions of instructions per second. A faster processor can execute instructions more quickly. However, the actual speed of the computer depends on the speed of many different components not just the processor

Microsoft CPU Types
Pentium P1, P2, P3, P4
Intel i3,i5,i7,i9



Arithmetic Logic Unit (ALU)

The arithmetic logic unit is that part of the CPU that handles all the calculations the CPU may need. The main functions of the ALU are to do arithmetic and logic operations, including bit shifting operations. These are essential processes that need to be done on almost any data that is being processed by the CPU.

Control unit (CU)

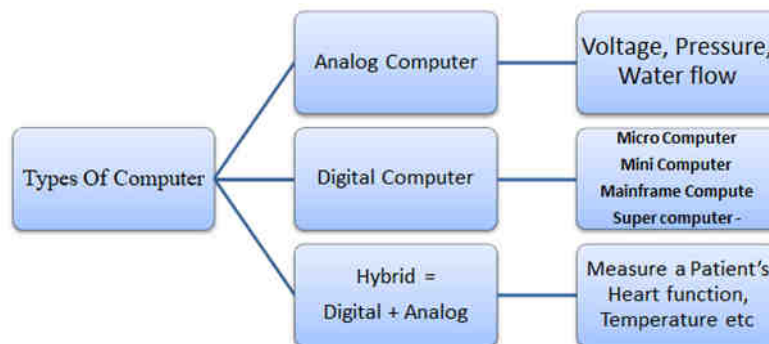
CU is a component of a computer's central processing unit (CPU) that directs the operation of the processor. It tells the computer's memory, arithmetic/logic unit and input and output devices on how to respond to a program's instructions.

Output

There is nothing to be amazed by what the output unit is used for. All the information sent to the computer once processed is received by the user through the output unit. Devices like printers, monitors, projector, etc. all come under the output unit.

The output unit displays the data either in the form of a soft copy or hard copy. The printer is for the hard copy. The monitor is for the display. The output unit accepts the data in binary form from the computer. It then converts it into a readable form for the user.

TYPES OF COMPUTER ON THE BASIS OF WORKING



TYPES OF COMPUTER ON THE BASIS OF SIZE

- ✓ Main frame,
- ✓ Mini Computer
- ✓ Super Computer
- ✓ Work station
- ✓ Micro Computer
- ✓ Desktop Computer
- ✓ Laptop Computer
- ✓ Palmtop Computer

Difference between Digital & analog Computer

Analog Computer	Digital Computer
Slow Speed	Fast speed
Less accuracy	More accuracy
Low Memory	Big Memory
Give Results in graphical form	Give Results in discrete form
Difficult to use.	Easy to use
Less Reliable	More Reliable
Use in Engineering & Science.	Use in all field of life.
e.g... Analog Clock ,& Thermometer etc e.g...	e.g. Digital Clock, Laptop & Digital Camera etc

Types of Digital computers**Mainframes**

Mainframe computers or mainframes are computers used primarily by large organizations for critical applications; bulk data processing, such as census, industry and consumer statistics, enterprise resource planning; and transaction processing.

Minicomputer

A minicomputer is a type of computer that possesses most of the features and capabilities of a large computer but is smaller in physical size. Used Institutions, Libraries, Research, Health care

Supercomputer

They are most expensive of all the computers. These computers are big general purpose computers capable of executing more than 10,000 million instruction per second and have storage capacities of millions of bits per chip. Used to Climate research, Large businesses, Scientific simulation

Work station

A workstation is a computer intended for individual use that is faster and more capable than a personal computer. It's intended for business or professional use (rather than home or recreational use).

Micro Computer

A microcomputer is a computer with a central processing unit (CPU) as a microprocessor. Designed for individual use, a microcomputer is smaller than a mainframe or a minicomputer /

Desktop computer

A desktop computer is a personal computer that fits on or under a desk. It has a monitor or another display, keyboard, mouse, and either a horizontal or vertical (tower) form factor. Unlike a laptop, which is portable, a desktop computer is meant to stay at one location.

Laptop Computer

a computer that is portable and suitable for use while travelling.

Palmtop Computer

A very small computer that can be held on the palm of one hand.

TYPES OF COMPUTER ON THE BASIS OF PROCESSOR

A processor is made of four basic elements: the arithmetic logic unit (ALU), the floating point unit (FPU), registers, and the cache memories. The ALU and FPU carry basic and advanced arithmetic and logic operations on numbers, and then results are sent to the registers, which also store instructions.

PC/XT – Personal Computer Extended Technology

The XT was a PC system that included a hard disk for storage in addition to the floppy drives found in the basic PC system. These systems had an 8-bit 8088 processor and an 8-bit Industry Standard Architecture (ISA) bus for system expansion

AT - Advanced-Technology

The most significant differences were that the AT had an 80286 processor and a 16 bit data bus, and enough address lines to handle more than the one megabyte of addressable memory space from the XT's 8088 processor.

Pentium (i3, i5, i7)

Intel made the Pentium, Xeon and Celeron, the more used Intel processors are core i3, i5, i7 and i9. A core is an important part of the processor that performs calculations, receives instructions and processes those instructions. The more cores the device has the faster it can process data and an overall increase in the performance of applications and frame rates in video games.

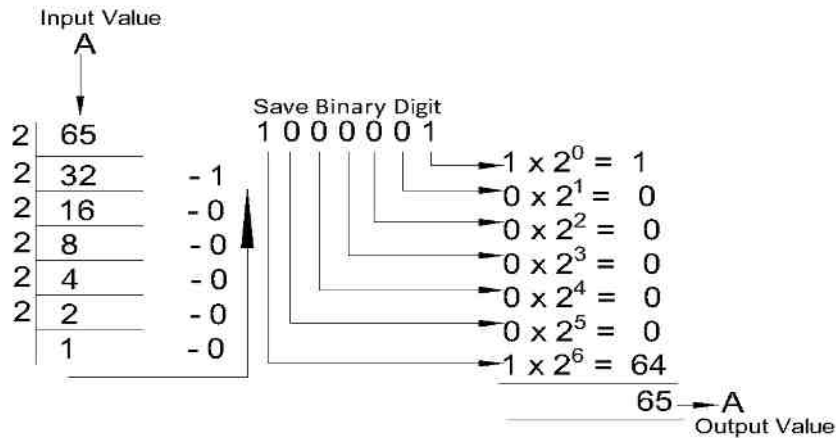
The i3 has 2-4 cores, i5 has 4-6 cores, i7 has 6-8 cores and the i9 has 8 cores. Having more cores is only beneficial if you're more into video editing and rendering and playing intense video games.

Differences between PC/XT and AT Systems

System Attributes	PC/XT Type (8-Bit)	AT Type (16/32/64-Bit)
Supported processors	All x86 or x88	286 or higher
Processor modes	Real	Real/Protected/Virtual Real
Software supported	16-bit only	16- or 32-bit
Bus slot width	8-bit	16/32/64-bit
Slot type	ISA only	ISA, EISA, MCA, PC-Card, Card bus, VL-Bus, PCI, and AGP
Hardware interrupts	8 (6 usable)	16 (11 usable)
DMA channels	4 (3 usable)	8 (7 usable)
Maximum RAM	1MB	16MB/4GB or more
Floppy controller speed	250Kbps	250/300/500/1,000 Kbps
Standard boot drive	360KB or 720KB	1.2MB/1.44MB/2.88MB
Keyboard interface	Unidirectional	Bidirectional
CMOS memory/clock	None standard	MC146818-compatible
Serial-port UART	8250B	16450/16550A or greater

Memory Storage Units

UNITS	VALUE
1 Bit – (Binary Digit)	0 or 1 Binary Digit
4 Bit	1 Nipple (N)
8 Bits	1 Byte (B)
1024 Bytes	1 Kilo Byte (KB)
1024 Kilo Bytes (KB)	1 Mega Byte (MB)
1024 Mega Byte (MB)	1 Giga Byte (GB)
1024 Giga Byte (GB)	1 Terabyte (TB)
1024 Terabyte (TB)	1 Petabyte (PB)



ASCII - American Standard Code for Information Interchange is a character encoding standard for electronic communication.

ASCII - Character Value of k = 107. You Will Find Binary Value of k?

Type of Memory?

Primary Memory: RAM, ROM, PROM, EPROM, EEPROM, DDR

Secondary Memory: Hard disk, SSD, CD, DVD, Blue ray Disc, Pen Drive, Magnetic tape & Zip disk

RAM - Random Access Memory



RAM (Random Access Memory) is the hardware in a computing device where the operating system (OS), application programs and data in current use are kept so they can be quickly reached by the device's processor. RAM is the main memory in a computer, If a PC or smartphone is advertised as having 4-GB RAM or 16-GB RAM, those numbers refer to the DRAM, or main memory, in the device. Volatile Memory

- ✓ **SDRAM** - Synchronous Dynamic Random-Access Memory
- ✓ **DDR** - (Double Data Rate), SDRAM - DDR1, DDR2,DDR3,DDR4
- ✓ **DRAM** - (Dynamic Random Access Memory)
- ✓ **SRAM** - (Static Random Access Memory)
- ✓ **ROM** - Read-Only Memory

Read-only memory (ROM) is a type of storage medium that permanently stores data on personal computers (PCs) and other electronic devices. It contains the programming needed to start a PC, which is essential for boot-up; it performs major input/output tasks and holds programs or software instructions.

Because ROM is read-only, it cannot be changed; it is permanent and non-volatile, meaning it also holds its memory even when power is removed. By contrast, random access memory (**RAM**) is

volatile; it is lost when power is removed.

Other Types of non-volatile memory include

- **PROM** - Programmable Read-Only Memory
- **EPROM** - Electrically Programmable Read-Only Memory
- **EEPROM** - Electrically Erasable Programmable Read-Only Memory also called Flash ROM
- **EAROM** - Electrically Alterable Read-Only Memory

There are four types of primary storage:

- ✓ Read Only Memory (ROM)
- ✓ Random Access Memory (RAM)
- ✓ Flash memory
- ✓ Cache memory

Secondary Storage Devices Or Auxiliary Storage Devices or Fixed or Permanent



Magnetic storage devices

A – Floppy 3 ½ Inch = 1.44 MB
 B – Floppy 5 ¼ Inch = 1.2 MB
Zip disk = 100MB to 250MB
 Hard Disk - 40GB to 16TB
(Large Storage Driver)

Optical Storage Device Mode By POLY CARBONATE

CD – Compact Disc – 700 MB
 DVD - Digital Video Disc – 4.7 GB
 DIVIX - 4.7 GB (Single Layer), 9.4 GB (Double Layer)
 Blue Ray Disc - 25GB (Single layer), 50GB (Double Layer)



Flash Memory or Semiconductor memory or silicon wafers
SSD, Pen driver & Memory Card
 2GB Update 2TB

Magnetic Tape



Magnetic tape is a medium for magnetic recording, made of a thin, magnetizable coating on a long, narrow strip of plastic film. It was developed in Germany in 1928, based on magnetic wire recording. Devices that record and play back audio and video using magnetic tape are tape recorders and video tape recorders respectively. A device that stores computer data on magnetic tape is known as a tape drive.

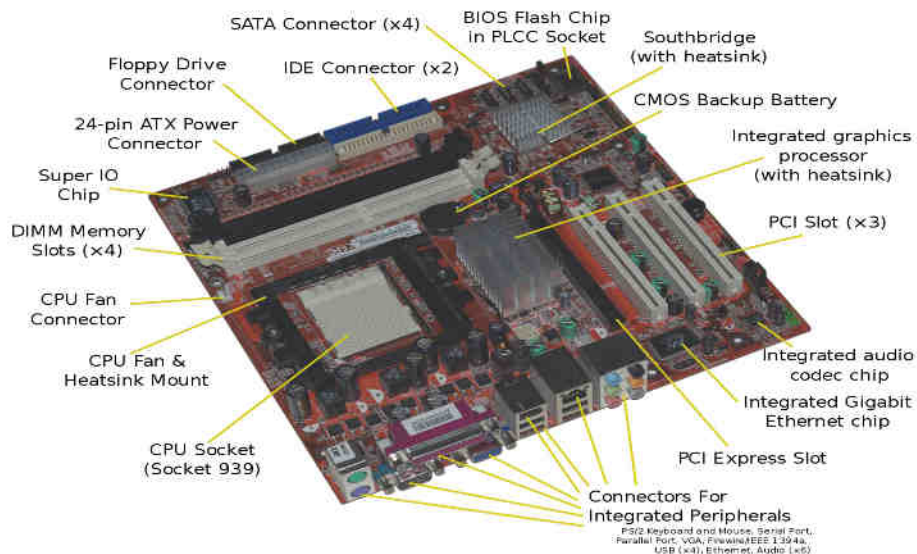
Storage Devices or Auxiliary Storage Devices

- ✓ Floppy disk: It stores a small amount of information.
- ✓ CD - Compact disc: It stores information More than a floppy Disk. Thickness 1.2MM, 120MM Diameter. (Made By Poly Carbonate)
- ✓ DVD - It stores information many times more than a CD.
- ✓ Hard disk: It stores a large amount of information.
- ✓ We have the following types of fixed storage:
- ✓ Internal flash memory (rare)
- ✓ SSD (solid-state disk) units
- ✓ Hard disk drives (HDD)

Primary Storage & Secondary Storage

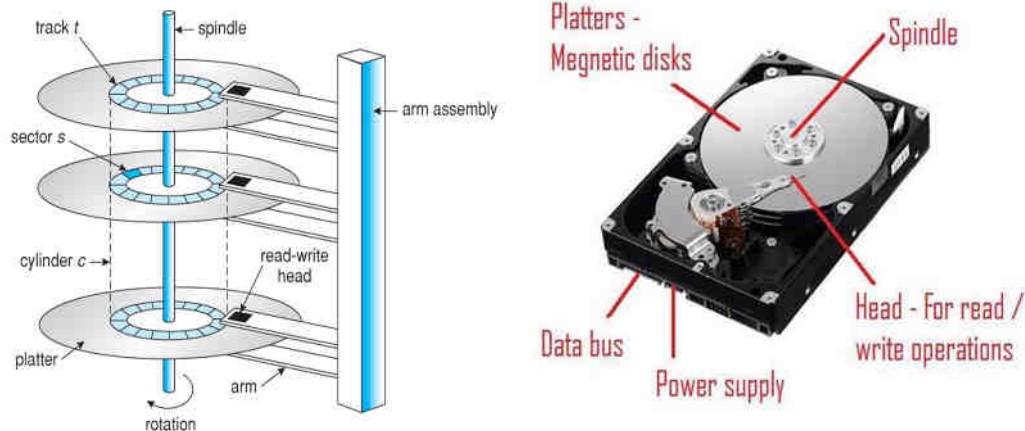
Primary Storage	Secondary Storage
It Refers to the main memory	It Refers to the Secondary or Auxiliary Memory.
Storages are temporary	Storage is Permanent.
It is expensive and smaller	It is cheaper and larger
This storages are faster	Storages are slower
Data is Lost when the device Loses Power	Data is intact even when the device Loses Power
Data is Directly accessed by the CPU	Data is not Directly accessed by the CPU
RAM-Random Access Memory Graphic card Memory Cache or CPU Memory	They are permanent storage devices such as: CD, DVD, HDD – Hard Disk Drive Floppy Disk. Pen Driver
Volatile Memory	Non- Volatile Memory

Mother Board



A motherboard is one of the most essential parts of a computer system. It holds together many of the crucial components of a computer, including the central processing unit (CPU), memory and connectors for input and output devices. The base of a motherboard consists of a very firm sheet of non-conductive material, typically some sort of rigid plastic. Thin layers of copper or aluminum foil, referred to as *traces*, are printed onto this sheet. These traces are very narrow and form the circuits between the various components. In addition to circuits, a motherboard contains a number of sockets and slots to connect the other components.

Hard Disk Drive (HDD)



A hard disk drive (HDD), hard disk, hard drive, or fixed disk is an electro-mechanical data storage device that uses magnetic storage to store and retrieve digital information using one or more rigid rapidly rotating disks (platters) coated with magnetic material. The platters are paired with magnetic heads, usually arranged on a moving actuator arm, which read and write data to the platter surfaces. Data is accessed in a random-access manner, meaning that individual blocks of data can be stored or retrieved in any order and not only sequentially. HDDs are a type of non-volatile storage, retaining stored data even when powered off.

SSD - Solid-State Drives

Solid-state drives (SSD) are a new generation of storage devices aimed at replacing traditional mechanical hard-disk drives (HDD). SSDs use flash-based memory rather than spinning disks, making them faster, more reliable and more energy-efficient. This storage technology was previously reserved for enterprise organizations and the most high-end PCs. Technology improvements have made them more affordable so they are now more common in mainstream devices. They are on average more expensive than HDDs but they provide more value. SSDs are available with storage capacities ranging from 32 gigabytes up to 8 terabytes

Types of DVDs:

DVDs can be divided into three main categories which are as follows:

DVD-ROM (Read-Only): These types of DVDs come with media already recorded on them, such as movie dvds. As the name suggests, data on these discs cannot be erased or added, so these discs are known as a read-only or non-writable DVD.

DVD-R (Writable): It allows you to record or write information to the DVD. However, you can write information only once as it becomes a read-only DVD once it is full.

DVD-RW (Rewritable or Erasable): This type of discs can be erased, written, or recorded multiple times.

Blu-Ray DVD

A Blu-ray disk is a type of high capacity optical disk medium, which is used to store a huge amount of data and to record and playback high definition video. Blu-ray was designed to supersede the DVD. While a CD is able to store 700 MB of data and a DVD is able to store 4.7 GB of data, a single Blu-ray disk is able to store up to 25 GB of data. The dual-layer Blu-ray disks can hold 50 GB of data. That amount of storage is equivalent to 4 hours of HDTV. There is also a double-sided dual-layer DVD, which is commonly used and able to store 17 GB of data.

Blu-ray disk uses the blue lasers, which help them to hold more information as compared to other optical media. The laser is actually known as 'blue-violet', but the developer rolls off the tongue to make 'Blue-violet-ray' a little earlier as 'Blu-ray'. The CDs and DVDs use the red laser, and their wavelength (650 nm) is greater than the blue-violet laser (405nm). With the help of a small wavelength, the laser can focus on a small area. In Blu-ray disks, we can use the same size, which is used by CD or DVD and store a large amount of data on a disk. Blu-ray is able to provide very high resolution as compared to the DVD. On the basis of standard definition, a DVD can provide a definition of 720x480 pixels. In contrast, the Blu-ray high definition contains 1920X1080 pixel resolution

SMPS –Switch Mode Power Supply



SMPS – Stands for Switch-Mode Power Supply. Its job is to convert **voltage AC 230v to DC** lower voltage 5V & 12 V power.

Keyboard

The keyboard is input devices. These are used for performing various functions. A computer keyboard has 104 keys. The keyboard has Letter keys, Number keys, Function keys, Arrow keys and Special keys. Let us learn about a few more keys on a keyboard.

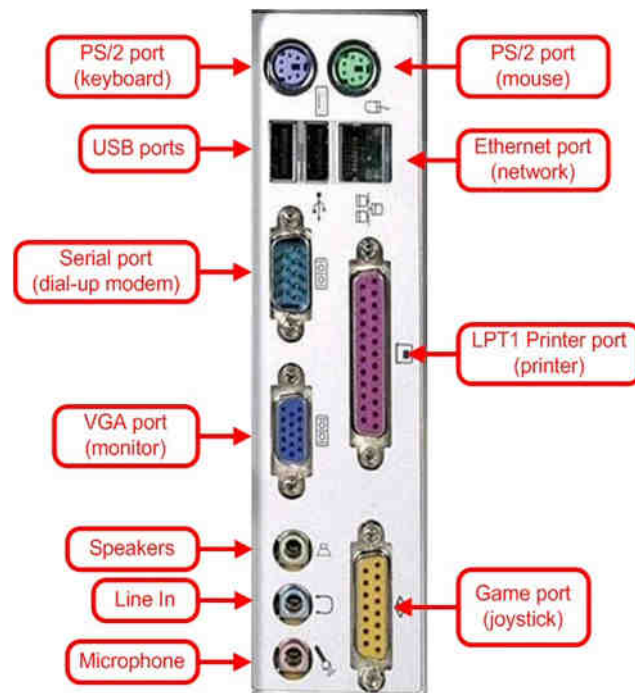
Type of Keys in Keyboard

- Alphabet Keys
- Number Keys
- Punctuation Keys
- Special Keys
- Modifier Keys
- Function Keys
- Navigation Keys
- Toggle Keys

Mouse

- ✓ The mouse is a pointing device . You can give input to the computer with the help of the mouse.
- ✓ Clicking : Pressing and releasing the mouse button to make the computer do some work.
- ✓ Double-click : To press the left mouse button twice quickly, Select Program will be Open.
- ✓ Right-click : To Press the right mouse button once different purposes.
- ✓ Single-click : To press the left mouse button once before purposes.

Connecting Port



- The LPT Port which stands for Line Printer Port
- Parallel Port uses a 25-pin connector (Type DB-25) and is used to connect printers, computers and other devices that need relatively high bandwidth.
- The Serial Port which may also be called a mouse port
- The USB Port which stand for Universal Serial Bus
- The Game Port which can be used for a joy stick

All Computer Parts Glossary

- Headphones** : The device for listening to the recorded sounds without disturbing others.
- Joystick** : It is used for playing computer games.
- Keyboard** : This is used to enter data into the computer system.
- Microphone** : It is used for recording sound.
- Monitor** : It shows whatever you type on the keyboard or draw with the mouse.
- Mouse** : It is pointing device.
- Scanner** : It copies pictures and pages and turns into images that can be saved on a computer.
- Speakers** : These are used for listening to recorded sound.
- Wed camera** : It is used for taking live photos and videos.
- Digital Camera** : A Digital Camera records and it Stores photos in digital Form.

COMPUTER CONNECTING WIRE



With so many types of cables, it's hard to find a singular source of information that highlights the important differences between them all. Here's an overview of the most common computer cable types you'll encounter when dealing with computers.

20 + 4 Pin ATX / Motherboard Connector

This is the main ATX connector that supplies power to motherboard and other components like RAM, Low-end graphics card, PCI cards that are connected to motherboard. Earlier motherboards have 20 pin sockets only but now modern-day motherboards require 24-pin power connectors.

CPU 4 + 4 Pin Connector

This is the 12 Volt connector that supplies power to CPU or Processor. Some motherboards have 4 pins 12V CPU socket and some have 8 pins 12V socket, therefore most of the good power supplies come with 8-pin (4 + 4) detachable connectors which can be split into two 4 pin connectors.

SATA Power Connector

This power connector is used to power up SATA devices that mostly include Hard Disks, DVD Writers / Drives.

Floppy 4 Pin Connector

This 4 pin power connector is used to power floppy drives. Floppy Drives are not being used commonly, but in some cases they can prove very useful.

Peripheral 4 Pin Molex Connector

Peripheral 4 Pin Molex Connector is used to provide power to IDE devices and other peripherals like Fans, case lights etc

PCI-e 6 Pin / PCI-e 8 Pin Connector

PCI-e 6 Pin or PCI-e 6+2 Pin are 12 Volt Connectors that are used to provide power to mid to high range graphics cards that require extra amount of power for their working

COMPUTER CONNECTING CABLE**VGA Cable**

Also known as D-sub cable, analog video cable, Connect one end to: computer monitor, television (PC input port)

DVI Cable

Connect one end to: computer monitor, Connect other end to: DVI port on computer

HDMI Cable

Connect one end to: computer monitor, television, Connect other end to: HDMI port on computer

PS/2 Cable

Connect one end to: PS/2 keyboard, PS/2 mouse

Ethernet Cable

Also known as RJ-45 cable, Connect one end to: router, network switch

USB Cable

For USB computer cable connections, there are two popular formats: USB 2.0 and the newer USB 3.0

TYPES OF PC CARDS**Graphics card**

Enables to display images and videos on screen

Sound card

Enables to play music on a computer

NIC - Network Interface Controller (Network card)

Allows computers to communicate each other **providing network connection, is an indispensable hardware component for any network**. Especially for the enterprise or data center users, the use of network interface card has been multifarious. There are NIC cards with diverse port counts, data rates, or even different transmission media.

Modem card

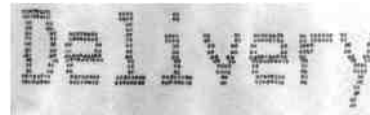
Used to connect to a telephone line to get dialup internet service

Types of Printers

DMP - Dot Matrix Printer (Impact Printer)	Inkjet Printer (Non- Impact Printer)	Laser Printer (Non- Impact Printer)
Low Speed	Medium Speed	High Speed
Single Colour & Multi Page Printer	Multi-Colour	Single Colour
Very Low Cost Expense	High Cost	Low Cost
High Noise Pollution	Low Noise	Low Noise
Ribbon Based Printer Like Typewriting Machine	Ink Based Printer (Cartridge or Ink Tank)	Toner (Monochrome)
Billing Purpose	Colour Printing (Photos)	DTP – Works

Plotter : Plotters can work on very large sheets of paper while maintaining high resolution. They can print on a wide variety of flat materials including plywood, aluminum, sheet steel, cardboard, and plastic. Its For **Auto CAD Drawing Printer**.

Dot Matrix Printer (DMP)



Definition - A dot matrix printer (DMP) is a type of printer which uses pins impacting an ink ribbon to print. These printers are generally considered outdated, as they cannot create high-quality prints and are costly as well. However, they have a certain specialty that other printers like inkjet and laser printers do not have: as they use impact for printing, they can be used to print multiple copies of text at the same time with the help of carbon copying. Therefore, they are mostly used in places where multipart forms are required.

A dot matrix printer is also known as an impact matrix printer

The printer supported a character generator for **128 characters** with a **Print Matrix of 7×5**.

Laser Printer

A laser printer is a popular type of personal computer printer that uses a non-impact (keys don't strike the paper), photocopier technology. When a document is sent to the printer, a laser beam "draws" the document on a selenium-coated drum using electrical charges. After the drum is charged, it is rolled in toner, a dry powder type of ink. The toner adheres to the charged image on the drum. The toner is transferred onto a piece of paper and fused to the paper with heat and pressure. After the document is printed, the electrical charge is removed from the drum and the excess toner is collected. Most laser printers print only in monochrome. A color laser printer is up to 10 times more expensive than a monochrome laser printer.

Laser Printer is High Speed Printer

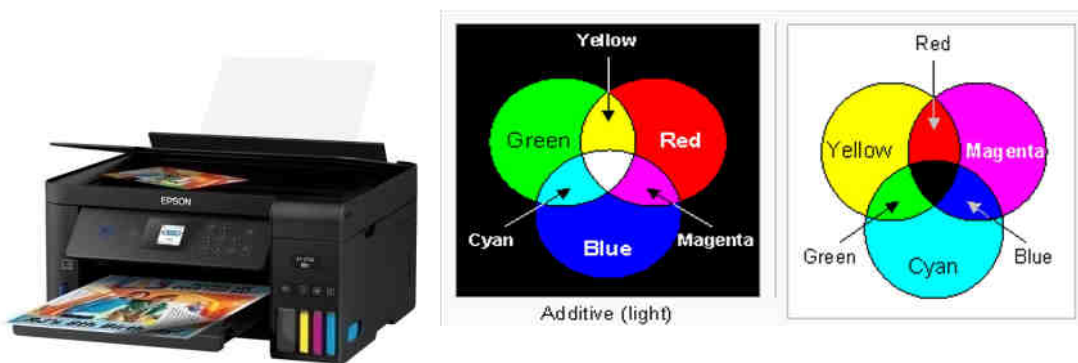
IBM introduced the first laser printer in 1975 for use with its mainframe computers. In 1984, Hewlett-Packard revolutionized laser-printing technology with its first LaserJet. The leading manufacturer Hewlett Packard, Lexmark, Okidata, and Xerox.

Inkjet Printer

An inkjet printer is a computer peripheral that produces hard copy by spraying ink onto paper. A typical inkjet printer can produce copy with a resolution of at least 300 **dots per inch (dpi)**. Some inkjet printers can make full color hard copies at 600 dpi or more. Many models include other devices such as a scanner , photocopier , and dedicated fax machine along with the printer in a single box. **Non-impact Print**

RGB - Red, Green, Blue (original parents of all the future generations of colors.)

CYMK- Cyan, Yellow, Magenta, Block



Types of Monitor or VDU -Visual Display Unit

- CRT– Cathode Ray Tube (Oldest One)
- LCD – Liquid Crystal Display
- LED – Light Emitting Diodes
- TFT - Thin Film Transistors



Touch Screen Monitor Is Same Its Input and Output Same Screen Like ATM Machine and Touch Mobile.

The different LCD and LED

LCD and LED Look Like same But Picture Quality is Height LED

Input, Output Devices

Input and output devices allow the computer system to interact with the outside world by moving data into and out of the system.

An input device is used to bring data into the system. Some input devices are:

- ✓ Keyboard
- ✓ Mouse

- ✓ Microphone
- ✓ Bar code reader
- ✓ Graphics tablet

An output device is used to send data out of the system. Some output devices are:

- Monitor
- Printer
- Plotter
- Speaker

Input, Output devices or I/O devices.

Input/output devices are usually called I/O devices. They are directly connected to an electronic module inside the systems unit called a device controller. For example, the speakers of a multimedia computer system are directly connected to a device controller called an audio card (such as a SoundBlaster), which in turn is connected to the rest of the system. Sometimes secondary memory devices like the hard disk are called I/O devices (because they move data in and out of main memory.) What counts as an I/O device depends on context. To a user, an I/O device is something outside of the system box. To a programmer, everything outside of the processor and main memory looks like an I/O devices. To an engineer working on the design of a processor, everything outside of the processor is an I/O device.

A computer is an electronic device used for performing calculations and controlling operations. It is a collection of hardware and software components that help you complete many different t tasks.

Input Device

- ✓ An input device is used to feed data into computer.
- ✓ Input devices are capable of converting data into a form which can be recognized by computer.
- ✓ A computer has several input device namely, Keyboard, Mouse, Trackball, Joystick, Scanner, Light pen, Bar Code Reader, OCR, OMR, MICR etc.

Mouse

- ✓ Mouse is an input device that controls the movement of the cursor on the display screen.
- ✓ Mouse stands for —Mechanically Operated User Serial Engine.
- ✓ The Mouse is used as a pointing device.
- ✓ Mouse is a small device; you can roll/navigate along a flat surface.
- ✓ In a mouse, a small ball/IR rays is kept inside and touches the pad through a hole at the bottom of the mouse.

There are two types of mouse.

1. Mechanical
2. Optical

Mechanical: This mouse has a small rubber ball underneath that moves against two rollers as it passes across a flat surface.

Optical: This mouse more accurate and has no moving parts. Ts use a laser to detect movement.

Installation of Scanner and Printer

Connect your printer by a wire, plug it into your device. It'll connect automatically, your PC will download the right drivers, and you can use it right away. To connect a wireless printer, follow these steps:

Select the Start button, then select Settings > Devices > Printers & scanners > Add a printer or scanner.



- ✓ Wait for it to find nearby printers, then choose the one you want to use, and select Add device. If you want to remove the printer later, just highlight it and select Remove.
- ✓ If you don't see your printer, try to fix the problem by using the steps in
- ✓ Connecting Monitor, Mouse, Keyboard to System Unit
- ✓ You might need to connect the monitor, keyboard, and mouse to the system. To connect a monitor, mouse and keyboard perform the following steps:
- ✓ Locate the graphics adapter at the rear of the server.
- ✓ Connect a keyboard and mouse to the USB ports.
- ✓ Connect a standard monitor to the adapter to use the console.
- ✓ Power on the console.
- ✓ Connect the power cables for the server and wait for the green light on the operator panel to start flashing.
- ✓ Install an operating system and update the operating system, if required

Key Words

AC—Alternating Current	DVD—Digital Versatile Disc	Mb—Megabit
ALU—Arithmetic and Logical Unit	EPROM—Erasable	MB—Megabyte
ASCII—American Standard Code for Information Interchange	Programmable Read-Only Memory	MICR—Magnetic Ink Character Recognition
AT—Advanced Technology	GB—Gigabyte	OCR - Optical character recognition
BIOS—Basic Input Output System	HDD—Hard Disk Drive	OMR - Optical Mark recognition
bit—binary digit	HP—Hewlett-Packard	MS-DOS—Microsoft DOS
CAD—Computer-Aided Design	IBM—International Business Machines	RAM—Random Access Memory
CD—Compact Disc	IC—Integrated Circuit	RGB—Red, Green, Blue
CD-R—CD-Recordable		

CD-ROM—CD Read-Only Memory	IEEE—Institute of Electrical and Electronics Engineers	ROM—Read Only Memory
CD-RW—CD-Rewritable	I/O—Input/output	DVD-R—DVD-Recordable
CNC—Computer Numerical Control	KB—Keyboard	DVD-ROM—DVD-Read Only Memory
COMPUTER-Common Operating Machine Particularly Used for Trade, Education, and Research	kHz—Kilohertz	E-mail—Electronic mail
CPU—Central Processing Unit	LAN—Local Area Network	SDRAM—Synchronous Dynamic Random Access Memory
DOS—Disk Operating System	LCD—Liquid Crystal Display	UPS—Uninterruptible Power Supply
DP—Dot Pitch	LCR—Least Cost Routing	USB—Universal Serial Bus
DPI—Dots Per Inch	LED—Light-Emitting Diode	VGA—Video Graphics Adapter
DVD—Digital Video Disc	MAN—Metropolitan Area Network	WAN—Wide Area Network
KB—Kilobyte	DVD-RW—DVD-Rewritable	

TWO MARKS QUESTION

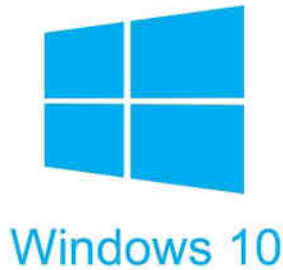
1. Block Diagram of computer?
2. Define Generations of Computer?
3. Describe the various types of computers based on working principle and size?
4. Define Secondary Storage?
5. Define SMPS?
6. Define Speed?
7. Difference between Digital & Analog Computer?
8. How will you classify computer systems?
9. Difference between Primary Storage & Secondary Storage or memory?
10. Difference between Hard Disk & SSD?
11. Differentiate PROM and EPROM?
12. Types of Computer connecting wire?
13. Types of computer?
14. Types of Monitor?
15. Types of Digital Computer?
16. Types of Printers?
17. Types of Storages?
18. What are the characteristics of a laser Printer?
19. What are the characteristics of computer?
20. How will you classify computer system?
21. What are the logical operations performed by ALU?
22. What is Computer?
23. Write any two advantages of pen drive over CD?
24. Write the advantages of Hard Disk?
25. Write the advantages of SSD?
26. What is AT/XT processor?
27. What is NIC card?

FIVE MARKS QUESTIONS

1. Briefly explain the types of computer
2. Describe about the history and generation of computer
3. Describe the applications of computer
4. Describe the various types of computers based on working principle and size?
5. Elaborate on various output devices.
6. Explain about CPU with necessary diagram.
7. Explain about the history and generation of computers
8. Explain about the Input and out Devices
9. Explain the basic Components of a computer with a neat diagram?.
10. Explain the characteristics of a computer?
11. Explain the various components of CPU
12. Explain the working principle of a computer with Block Diagram.
13. Explain the working Principle of a computer with the help of a block diagram?
14. Explain the working principle of laser printer.?
15. What are the characteristics of the computer? Explain.
16. What are the different types of memory? Explain in detail?
17. With a neat block diagram, explain the working principle of a computer?
18. Write the steps to install a printer.

UNIT – II

OPERATING SYSTEMS : MS-WINDOWS & LINUX

**Operating System (OS)**

An operating system is a software which acts as an interface between the end user and computer hardware.

Every computer must have at least one OS to run other programs. An application like Chrome, MS Word, Games.

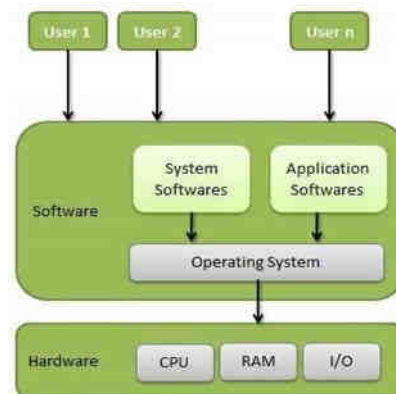
without having an operating system (OS) Computer & Mobile device.

Mobile OS – Android, Windows, IOS, WebOS

Computer OS - Windows, MAC OS, Unix, Linux

Functions Operating System

- A set of programs that lies between applications software and the hardware
- Manages computer's resources (CPU, peripheral devices)
- Establishes a user interface
- Determines how user interacts with operating system
- Provides and executes services for applications software



Following are some of important functions of an operating System.

- Memory Management
- Processor Management
- Device Management
- File Management
- Security
- Control over system performance
- Job accounting
- Error detecting aids

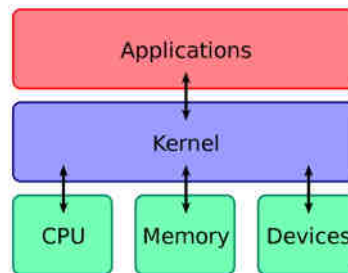
Coordination between other software and users

Its Control to All Computer parts and Software Establish a user interface

Execute and provide services for applications software

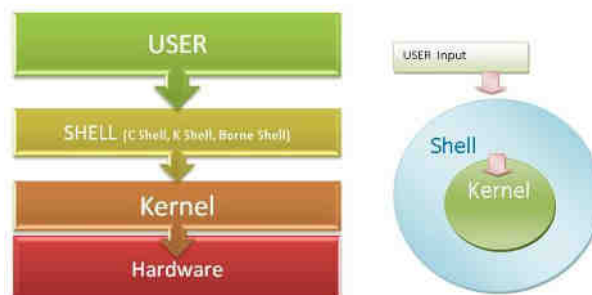
What is the Kernel?

A kernel is the lowest level of easily replaceable software that interfaces with the hardware in your computer. It is responsible for interfacing all of your applications that are running in “user mode” down to the physical hardware, and allowing processes, known as servers, to get information from each other using inter-process communication (IPC).



What is the Shell?

A Shell provides you with an interface to the Unix system. It gathers input from you and executes programs based on that input. When a program finishes executing, it displays that program's output. Shell is an environment in which we can run our **1. Interactive Mode - Commands, 2. Programming Mode - shell scripts.**



Types Operating System

Operating systems are classified into four categories, depending on:

- ✓ The Number of Users they serve
- ✓ The Tasks they perform.

Types

1. Real-Time Operating System (RTOS)
2. Single-User, Single-Task OS
3. Single-User, Multitask OS
4. Multiuser OS



Real-Time Operating System (RTOS)

Systems with : Specific Purpose Certain Result.

RTOS referred to as embedded systems

RTOS don't require the intervention of any users at all.



Uses include:

- ✓ Industrial machines
- ✓ Robotic equipment
- ✓ car engines
- ✓ Home appliances such as washing machines, dryers, AC etc.

Hard Real-Time:

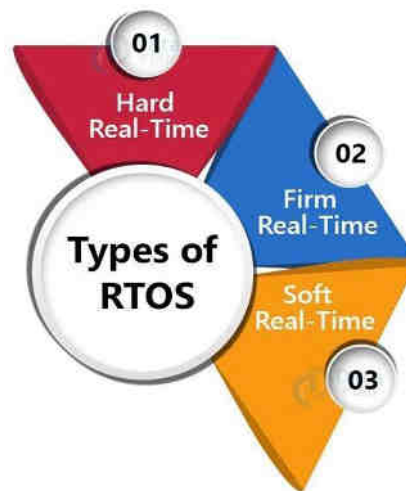
This type handles deadlines very strictly. Thus, the given task must start and finish execution within the assigned time duration. Example: Medical critical care system and aircraft systems.

Firm Real-Time:

This type needs to follow deadlines though one or two missing deadlines would not have a big impact they could still cause undesired effects. These effects include a huge reduction in the quality of a product. Example: Multimedia applications.

Soft Real-Time:

This type handles delays by the OS softly. Though there is a deadline assigned for a specific job, a little delay is acceptable. Example: Livestock price quotation system.



Examples of the real-time operating systems: Airline traffic control systems, Command Control Systems, Airlines reservation system, Heart Pacemaker, Network Multimedia Systems, Robot etc.

Single-User Operating Systems

- **Single-task systems**
 - Perform one task at a time
- Examples:
 1. PDAs:
 - They require single-user, single-task operating system software such as:
 - Palm OS
 - Windows Mobile
 2. Microsoft Disk Operating System (MS-DOS)

- **Multitask systems**
- Perform simultaneous tasks
- **Examples:**
 - Windows
 - MAC OS
 - Linux

