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Basic of Computer SYLLABUS

* Module = 1

Fundamental of Computer System

1) Characteristics and feature of Computer
2) Components and organisation of Computer

Computer generation and classification

1) Computer and classification : distributed and Parallel

2) Generation of Computer 1st - 5th

3) Types of memory = primary and secondary
   1) RAM
   2) ROM
   3) PROM
   4) EPROM

- Advantages and Disadvantages of Computer.
- Secondary Storage devices.
  FD, CD, HD, pendrive, DBP, TaP drive.
- Basic Input and Output devices.
  1) Input devices : Touch screen, OMR, OCR
     Light Pen, Scanners.

  2) output devices : Degitiers, Plotters, LCD
     Plasma, Printers.

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Bac.

Father of Computer Charles Babbage (Greatly 19th Century)

Computer = Computer is an electronic device which takes input data from input devices & process it and produce some desire output

The First Computer

1) Supper Computer is Fastest type of Computer

2) They are so expencives

3) Super Computers are employed for specialised purpose.

That required large number of Mathematical Calculation.

* CPU (Central processing unit)

1) CPU is brain of Computer.

2) Primary Component of Computer

3) CPU Consist of logical unit and Control unit

4) Also refer as a processor.

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* Chaxectexsatic of Computex.

1) Speed 2) Storage 3) Automation
4) Accuxacy 5) Reliability 6) Vexsalility
7) Consistency

(1) Speed

1] Computex speed is Fastex than human.

2] It pexfoxm Mathematical Calculation Very quickely.

3] Computex have ability to pxocess milions of instxuction at a time

4] Computex opxation pexfoxm in (micxo 10^{-6}) nano 10^{-9} speed.

5] The unit of Computex speed measuxed in MHz and GHz (mega Hz) (Giga Hz)

(2) Storage

Pximaxy — Secondaxy
RAM / Rom — HD, FD.

1) Storage is the place whexe you Can Savie youx data pexmantly.

2) Whenever you install any Program or Application in your system Computer copies the Programe or application to your Storage.

3) you Can save Vast data in storage with quick Access

4) Data Can be Save in Various Form like images, Audio, Text Files, Video. and this data Can be access easily whenever you need.

(3) Automation

Computers are automatic machine because once you Started a Job they Carry out the Job until it is Finished.

(4) Accuracy

1) When a Computer perform Compution or opration the Changes of error occuring are low

2) Error in Computer are Caused by human Submiting incorrect data.

3) A Computer Can do Vasities of task and Opration Fast and more Accuracy.

(5) Relibiability

1) Relibiability in Computer a refers to the ablity of Computer System of Component to Consistansly Perform it's required Funcation ~~whi~~ without Failure

2) Redeundancy, error checking macanisum helps to minimize risk of System Failure

3) A Computer is reliable it Can work well. without breaking down

(6) Vexsatility

1) Vexsatility refex to capacity of Computer. Computer Perform multiple task at a time withe Same accurges this is Called Vexsatility

The Capacity of Computer Perform more than one task at Same time is Called Vexs--

1) Consistency. Computex are Consisten in there Perfarmas which mean's they Can perform Same task repetradly. without any Variation in there output.

i) use of Computer for data processing in an organition need to reduction in paper work & speed of process.

Components of Computer.

1) Input unit 2) CPU 3) Output unit

- 1) Input unit

i) Input unit consists of input devices that are attached to Computers.
ii) This devices takes input from input devices and convert it into binary language that the Computer understand.
iii) Some of the common input devices are keyboard mouse, Scanner, Joistick
iv) Input unit is use to provide the data to the processer for further processing.

- 2) CPU

i) Once's the information is enter in to the Computer. by the input devices, the processer process it.

ii) CPU is called the brain of Computer because it is the control centre of Computer.

iii) It first pages fetch a intersection from memory and then enterprit then so as to know what to be done. therefore CPU exibute the require Compution & then either store's the output or desply it through the output devices.

iv) CPU has 3 main top component.

i) Axethmatic logic unit (ALU)
ii) Control unit (CU)
iii) memory unit (MU)

1] Axethmatic logic unit

i) It perform mathematical calculation & takes logical dissgen decistion
ii) mathematical calc includ addition, sub, multi. etc.
iii) Logical decisition involve the Compozition of to data atom.
To see which one is larger, smaller, or equal
iv) ALU is main Component of CPU

2] Control unit

i) It Co-ordinates & control the data flow in and out of a CPU and also controles Axethmatic opration of ALU.

ii) It instruct Computer's memory, ALU & input devices & output devices. on how to response to processer instruction.

3] Memory Unit

i) Resister's are use to store the data which is directly use to by processer
ii) Defn = Resister's are memory location that the CPU can access directly.
iii) Resister's are smallest and fastest memory in Computer.
iv) Resister's are different sizes 16 bit, 32 bit, 64 bit and so on.....
v) Each resister has different function like storing data, storing & instrction and storing addres of location in memory.

- Output Unit.

1) Outunit is consist of out put devies connected to the Computer.
2) It convert binary data coming from CPU to human understandable form
3) Commain output devices are monitor, printer, speaker projecter, etc.
4)

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* Components of Computer:

CPU

Input - Output

MU

ALU

Hardware Component

The physical component that makes up the Computer System. include all input output storage devices

=> It refer to the electrical parts and devices that makes of the Computer System.

Software Component.

Software is a set of instruction, data program use to operate Computers and execute specific task.

There are two type's under Software

i) System Software
ii) Application Software.

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RIME
Kept for Study

* Orgnization of Computer

i) Computer oraganation refers to the label level of abstraction above the digital logic level
But below the oprating system level.

ii) In Computer enggineering micro architecture also called Computer oraganization.
It is a way a given instruction set architecture is implemented on a processer.

iii) Computer oraganization consists of 4 part
1) CPU 2) memory 3) Input & 4) output

- Memory

- Computer memory is a physical device capeable of storing information tempory or permantly

- Ex= RAM is a type of Volitile memory that is store data in intigreated circuits & that is use by oprating system, software, hardware, user

- Computer memory divided into 2 types
i) Volatile memory

Primary memory is Volatile memory that mean it save data tempary that loses its contain when the computer and hardware device user loses power
Ex = RAM

ii) Non Volatile memory

It ~~gives~~ keeps it's contain even if power is lose
Ex = Rom
· Rom is a primary nonVolatile memory

Keyboard	CPU	Monitor
Mouse		Printer
	data information	
Scanner		Speaker
	Memory	
Other I/P		Other O/P

System Software = type of software that is the interface b/w application software & system.

Application software = type of software that runs as per user request.

	System Software	Application Software
i)	Low Language is used to write this software	i) High level language is used to write this language.
ii)	System software maintain the system resources and gives the path for application to run	ii) It runs on the platform which is provided by system software
iii)	It's general purpose software	iii) It is specific purpose software.
iv)	It requires low storage	iv) It requrs more storage

2) Generation of Computer.

1) The Computers in 1st generation uses Vaccum tubes for Processing

2) This Computer uses magnetic drum as a primary storage.

3) They are very large, expensive and unreliable.

4) ECKERT & Mauchly developed the 1st electronic Computer (ENIAC)
[Electronic Numerical Integretor And Computer]
In the year 1946 in USA.

5) The time periode of 1st generation Computer was 1946 to 1959

6) Punched Card & Paper tape, Use for it's secondary storage.

7) Ex = 1) ENIAC, 2) EDVAC
(electronic discrite variable automatic Computer)

3) UNIVAC
(Universal automatic Computer)

4) IBM-701
5) IBM-650

Advantages of 1st generation Computer.

1) It made use of Vaccume tubes which the only electronic Componant avaliable during this day.

2) This Computer's could Calculate in mili sec.

Disadvantages of 1st generation Computer.

1) These were big in size, weight was about 30 tones.

(2) This Computer was based on Vaccume tubes

3) This Computer were very Costly.

4) It put store only small amount of data. due to the presence of magnetic deum.

5) Vaccume tube require a large Colling System.

6) Very less work efficency.

7) B Punch Card were use to take input

8) large amount of energy Consumption.

9) It is not portable

Second generation of Computer.

1) The time Period of 2nd generation was 1959 - 1965

2) The Core element in this generation was transistors.

3) Vaccume tubes are replace by transistors.

4) Transistors makes 2nd generation Computer smaller, Faster & more reliable

5) The Primary Storage was magnetic Core memory. which makes 2nd generation Computer more reliable than magnetic drum.

6) Taps and magnetic disk use for secondry Storage.

7) Ex = IBM - 7094
UNIVAC - 1108
Honeywell - 400
CDC - 3600 : Control data Corporation
CDC - 1604
IBM - 1620

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Advantages of Secondary generation

- Due to the presence of transistor insited of Vacum tube the size of electron Components decreases
- This result is reducing the size of Computer.
- As Compere to 1st generation less energy and not produce as much heat as the 1st generation Computer.
- Asembly language & Punch Card where use For input
- low Cost than 1st generation Computer.
- Better speed, Calculate data micro sec.
- Better Portability than 1st generation Computer.

Disadvantages of Secondary generation

- A Cooling System was require
- Constant mentences is also require.
- Only use For specific purpose.

Third Generation (1965 - 1971)

- The time period of Third generation was from 1965 - 1971
- The core element use in this generation is integrated Circuits
- Integrated Circuits was a Single Component Consist of no. of transistor's
- I C was invented by Robert Noyce and Jack Kilby [1958 - 1959]

- Ex=> IBM-370
  2) IBM-360
  3) UNIVAC-1108

- Primary storage use in this generation are magnetic storage devices.
- Magnetic disk for Secondary Storage

Advantages of Third generation

- Devlopment of mini Computer
- This Computer where chiper as compare to 2nd gen. Computer.
- This are fast and reliabel
- Size of Computer is reduce due to the use of I C's
- Ic not only reduce size of Computer but also improve the performes about stog.
- This generation of Comp. has big Storage Capacity
- High level Progeuming language like FORTRAN - I to IV Pascal - PL1, COBOL, where use

- Keyboard & mouse where use as input device's
- The use an operating System for better resource mdgement
- This Computer reduce the Computational time from micro sec - nano sec (10^{-9})

Disadvantages of Third generation

- IC chip's are difficult to mentent
- AC is require
- The highly advance technology is required for Manifucturing IC chips

Four Generation of (1971 - 1985)

- The time period of 4th generation computer is 1971 - 1985
- The core element use in 4th gen. is LSI (large scale integrated circuit)
- The primary storage use in 4th gen. is Semi Conductor memory
  The secondary storage use in 4th gen. is magnetic tape & magnetic disk.
- In this gen. development of micro computer or PC started
- Ex = 1) IBM - 4314
  2) DEC - 10
  3) STAR - 1000
  4) PDP - 11
- Processing speed of 4th gen. Computer is measured in MIPS (milions of instruction per sec) or Flops (Floting point opration per sec)

Advantages of Fourth generation

- Size of Computer get reduce as compare to privious generation computer
- Heat generated is negligible
- Less mentance is require
- All types of high level language are use in this generation.

Disadvantages of Fourth generation

- Air Condition is require in many case's
- The micro processer desing & Faybrication are more complex.
- Advance technology is use to make integrated Circuit.

Fifth Generation (1985 - till date)

- 5th gen. Computer is also known as Future gen.
- The 5th gen. Computer are desktop, Laptop
- The 5th gen. Computer was Started from (1985 - till date.
- The Core Component use in this gen. is ULST (Ultra Large Scale IC)
- The Processing Speed of these Computer is measured in Flops (Floting Point oprations)
- The primary is RAM, Rom
- The Secondary Storage use in this gen. is HDD, SSD.
- All high level Progeiming languages like, C, CPP. Python, Java, axe includead

Advantages of Fifth generation

- It is more relable and more Facter It available in different Size's and with Fetures it provide Computer with more user Frendly interFaces with multiy media.

Disadvantages of Fifth generation.

- They may make human brain dull
- They need very low level language.

* Classification of Computers

Parallel Computing

1) It is also called as Parallel processing
2) It utilies several processer
3) Each of the proc. complete it's task in allocate time
4) Parallel Computing involve perform multiple task simultaneously
5) In Parallel Computing shared memory or distributed memory is use
6) Parallel Computing help's to increase CPU utiliation and improve the performes because several processer works simultaneously
7) The termilex one CPU has no impact on other CPU ~~Factionality~~ Fantionality
8) Parallel System is also called as tight tightly Coupled System

Advantages

1) It save time & money because many resources working togheter
2) It is easy to resaul large problem on Parallel Computing
3) You can do many things at once's using Parallel Computings.

Disadvantages

1) The multi core ~~arkeruxe~~ Cures Consusem a lot of Power
2) Parallel Soln are difficult to emplimant & debug
3) It increases over head over & cost due to synchronitization & data transfer

Distributed Computing

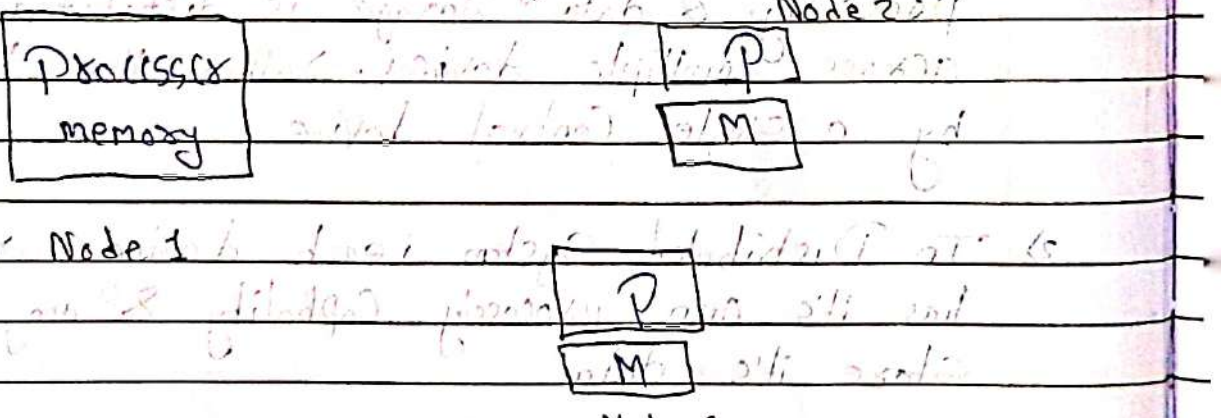
1) Distributed Computing refer's to a System where processing & data storage is distributed across multiple devices. rather than being handle by a single Central device
2) In Distributed System each device or system has it's own processing Capbality & may also store it's data

3) This devices work together to perform tasks and share resources with no single device serving as a central hub.

Advantages

1) It is Fexiable, making it simpal to install, use and debug new services.
2) In distributed Computing you may add multiple machines as you required
3) If the system crasses on the serval, that doesn't affect the other serval
4) A distributed Computing System may Combine Computional Capacity of serval Computer's, making it faster than traditional Computer

1) data sucu and sharing are main due to the feature of open system
2) The main disadvantage of this Computer syetem is the lack of software support



Que:-

Difference b/w Parallel Computing and Distributed Computing.

Parallel Computing	Distributed Computing.
1) Many operations are Performed Simultaneously	1) System Components are located at different
2) Single Computer is required	2) Uses multiple Computer
3) multiple processors perform multiple operations	3) Multiple Computers Perform multiple operations
4) It may have shared or distributed Memory	4) it have only distributed Memory.
5) Processors Communicate with each other through bus	5) Computer Communicate with each other through message passing.

Type's of Memory

* Memory

1) It is a Storge part of Computer system
2) Smallest unit of memory is called as bit
3) It is use to Store datas, information & program's
4) It Stores data either tempory or permantly
5) The main use of memory is to store data and ~~retrive data~~ retrive data

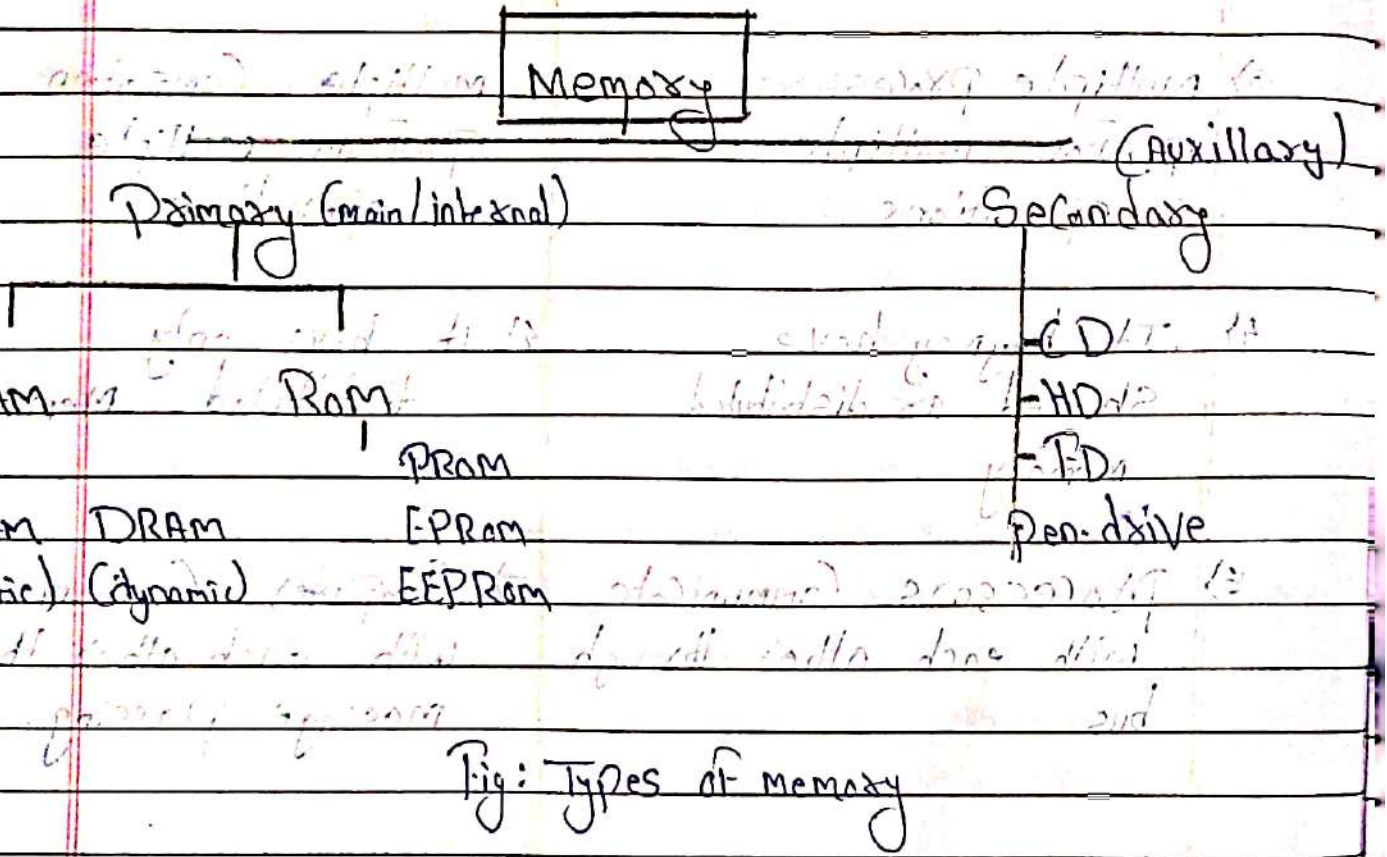


Fig: Types of memory

* Primary Memory

1) Primary memory is called as main or internal memory
2) Primary memory is Volatile in nature
3) Primary memory is directly axicble by CPU
4) It hold the data & instruction's that are presently working on System
5) It is also called as tempory memory.
6) Where the Power is Swich off it loses it's data
7) Primary memory is geneally of two type's
   i) RAM [Radom access memory]
   ii) Rom [Read only memory]

1] RAM

i) RAM stands For Radom ~~axicss~~ access memory
ii) In RAM the information is store as long as Power Supply is on
iii) RAM Read / Write memory
iv) It is tempory memory
v) There are Two type's of RAM

1) SRAM

- SRAM stands for Static Radom ~~axicss~~ access Memory
- Information Store in SRAM is loss when ever the Power Supply Swich off
- SRAM are of higher Cost & Consume more Power
- They have higher speed than DRAM

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2) DRAM

- It Stand's for dynamic ~~read~~ only random access memory
- This type of RAM store information in very short time basicaly a few mili sec. 10^{-3} even though power supply is ON
- The dynamic RAM is Cheper and of Moderate Speed
- It Consiume less Power

Advantages of Primary memory

1) Speed - RAM is much Faster than any other type of Storage Such as hard drive or Solid state device which mean's that the Computer Can access data store in RAM more quickly

2) Flexiabity - RAM is Volatile memory which mean's that the data Store in RAM Can be essay modify or deleted

3) Capacity - RAM Can be easily upgraded which allow the Computer to store more data in memory and thus improve Performus Paramuces

4) Power Management - RAM consume less power as compare to hard drive or SSD which make it ideal memory for portable devices

Disadvantages of RAM

1) Capacity - The capacity of RAM is limited and although it can be upgraded it may not be still sufficient.

2) Volatility - RAM is volatile memory which means that the data stored in it is lost when power switch off. This can be a problem for a important data that need to be preserved.

3) Cost - RAM can be reletively expensive as compare to other type of memory. Such as HD or SSD

2] ROM

i) Rom stand for Read only memory.

ii) Rom is a permanent type of memory.

iii) The information in Rom is not loss when the power is switch off.

iv) Rom Can not be Overwritten by Computer.

v) It is also Called as non-Volatile memory.

vi) "Rom is a Primary memory, because it is directly accessible by CPU."

Advantages of Rom

1) Non-Volatile - Rom is non-volatile memory which means that the data store in it is retained when the Power is turn off.

2) Relibility - Because the data store in Rom is not easily modified, It has less Chances to Cusput or error than any other type of memory.

3) Power Manegement - Rom Consume less Power as Compare to other type of Memory.

Disadvantages of Rom

1) Limited Flexibility.
2) Rom is Read only Memory that mean's data Stored in it Cannot be Modified it is not more flexiable

3) This Can be problem For applications that need to be modified.

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2) Limited Capacity = The Capacity of Ram is typically limited & upgraded need can be difficult or expensive.

3) Cost = Ram can be relatively expensive as compare to other types of memory such as [hard drive] HD or SSD (Solid state drive)

* Types of Rom

There are 3 types of Rom

1) PROM - Full Form of PRom is (Programeble Read only memory)

ii) It can be program by the user.
iii) one's programm, the data and instruction in it can't be change.
iv) Non Volatile memory.

Advantages of PRom

1) Non Volatile - Retains data with out Power

2) Stable Storage - once programmed the data is Permently store and can't be accedentl modified.

3) Fast Real times - quicky data readricble Similar to Ram.

Ultraviolet

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Disadvantages of PRom

1) One time programmable data can be only be retain, if an error is made, the chip is unusable

2) In Flexibility - Can not be updated.

3) Special equipment needed.
Required a specific programmer device for writing data.

2) EPROM

i) Exaseable programeble Read only memory

ii) It Can be reprogram

iii) To eraser a data it expose to UV light or Ray's

Advantages of EpRom

i) Reprogrammable Can be erase and reprogramm multiple time using UV light or Ray's

ii) Non-Volatile - Retains data without power

iii) Resusability - Sence it is erasible, it is Resebles

Disadvantages of EPROM.

i) Erasing process : Required UV light exposure to erase, which is time consuming.

ii) limited erase cycle : It can only be erase an data reprogrammed only a finite number of time.

iii) Special packaging : It needs a transferent window to allow UV light which increase cost

3) EEPROM

Electrically Erasable Programmable Read only memory.

i) Data can be erase by applying electric field with no need of UV light.

Advantages of EEPROM

i) Reprogrammeble

ii) Non-Volatile

iii) Convinent

Disadvantage of EEPROM

i) slower writing time

ii) limited write cycle

iii) Higher cost than PRom or EPRom

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* Secondary Storage Devices.

i) Secondary memory is also called as Auxillary memory. or external memory.

ii) It is not Volatile memory. means it can hold a data ~~with~~ or without power supply.

iii) It can save data permenatly.

iv) Secondary memory is slower in processing. typically primary is memory is 6 time faster than secondary memory.

v) Secondary memory is not directly accesible by CPU instead data acesses from a secondary memory is firstly load into the RAM and them send to the CPU.

- Example :-
  CD, HD, FD, pendrive, DVD, tapedrive.

Compact disk.

- It is a portable devices uses to store electronic data like, recording, storing, video & audio images
- It is made up of plastic - called polycarbonate plastic.
- It is circular in shape
- Cd are optically readable devices
- Cd are replacement of phonographic disk
- one side of CD is partial reflecting metal coating.
- It contain tracks & sectors
- optic media have much longer life span
- Storage capacity of CD is very less as compare to DVD or HDD.
- Storage capacity of CD is 700 mb
- CD invented in the year 1960 by american physicst James Russell

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- The Standerd diameter of CD is 120 mm and thickness is 1.2 mm

* There are 3 types of CD *

1) CD-R (Recordable)

- Rom is Compact disk recordable.
- This types of CD can be written only once cannot be eases.

2) CD-Rom. Capacity of Rom is 700 floppy dis

- Compact disk's Read only memory
- This disk's are read once after read it is as Rom, that is cannot be updated latter.

3) CD-RW (Rewritable)

- Compact disk Rewritable
- This type of compact disk written multiple times and can be easse also. like pendeive

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* Application :- or Advantages

1) Portable :- CD are more Compact and light weight they are easy to store & travel.

2) Reliable :- In that time an entire Software Can be Store 8" CD So that it is Very reliable For Software industry

3) Random acess :- CD can provide Random data acess User Can use this Random acess to choose the Specific File, music track or data

4) Rewritable Format :- another benifit of CD is the avalibilty of Rewritable Versions such as CD-RW

* (1) Disadvantages

1) Inferior Capacity :- CD have more Storage Capacity than there predisesar but Subsequnt Storage medium have more Capacity. Storage Capacity lower than HD DVD, Now days CD are not use at all.

IBM = international Business Machi.

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2) Older technology :- CD are not use because it is older technology.

3) Interior Quality :- DVD have max quality than CD.
audio, video, file's with higher quality can be store on DVD & Blue-ray disc.

4) durability issue :- It is easly scarsh if not ~~heat~~ treated carefully when expose to svere heat and humidity it mit deform and become unuseable

Floppy Disk :-

1) Floppy Disk is also called floppy, Floppy diskette
2) It is a type of Storage media that ~~store~~ reads the information.
3) It was extrimly expensive. it was one of the first h/w storage device devlop by IBM in (1967)
4) It is a portable device.
5) The disk was able to store only 80 KB data later Version are made which are able to store 800 KB.
6) Rate of data transfer in Floppy disk is very slow.
7) They are relitively small in size. which is main advantage of F.D.

USB = [illegible] USB

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8) The F.D. where replace by USB
9) As Compare to CD this are Smaller in Size.
10) Older Computer may not accept other data Storage device's. they are often Compatible with Floppy disk.

Hard Disk

1) Secondary Storage media Can Fixed or removable
2) Fixed Storage media is an internal Storage medium
3) A H.D. that is Fix inside a Computer

Fixed : HD, SSD, Internal Flash memory.

Removable : CD, DVD, Pendrive, mobile, tablet & external hard drive.

4) HD is Non Volatile device. which Store data like adio, Video, File's & OS.
HD is also Called as Fixed Storage or HDD.

5) HD include to main Componat
i) Platter and ii) Actuator

6) The platter is Circular magnetic disk Contininy track & Sector. that retains data

7) The Actuator arm move's across the platter to red and write data.

8) Nearly all Computer's are equipped with hard disk. (Internal storage drive) and you can also add external hard drive for more storage space.

9) They are relatively cheap, Fast access time than other storage devices but slower than SSD.

DVD

1) DVD stands for digital versatile disk or digital video disk.
2) DVD is type of optical disk.
3) It is same size as CD but has larger storage capacity.
4) It can store data from 4.7 GB to 17.08 GB
5) It is use to store high quality videos & Movie's
6) It is also use to store O.S. & HD
7) Information can be store on both side of DVD
8) DVD drive's are require to read DVD. CD can be also read using DVD drive.
9) There are also external CD drive's are aveleble.

* There are 3 types of DVD *

1) DVD-Rom : It can only use for Read the data, but can't be writen.
2) DVD-R : It can be use to record any type of data CD Recordable.
3) DVD-RW : It can be read, writen, earse & rewriten.

Pen Drive

1) It is a external storage devices pendrive connect to the computer through USB port. it is use to transfer the data from one devices to another.

2) To show or acess data in pendrive attached it to the computer. it is also called as USB drive, USB stick.

3) Pendrive can be use in a place of CD.

4) It is removable, Rewritable and smaller than optical disk usually weight is about less than 30 grams.

Tape Drive

Tape drive is a storage devices that reads and write data on magnetic tape.
Tape drive has several advantages over other storage media such as hard disk of SSD

Tape drive is cheaper, more durable & scaleble.

Magnetic tape data storage is typically use for offline archival of data storage.

Tape drive have sequenced acess of store data unlike HD. which provide direct acess storage

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Tape drive has a favourable cost & long archival stability.

// # Digital Audio Tape (DAT)

It is a secondary storage device that was originally develop for storing high quality recording.

It uses magnetic tape format.
The capacity of DAT is depends upon tap length.
Common capacity include 1.3 GB, 1.6 GB & up to 80 GB.

DAT can record audio with very high quality.

They are relible for long term data storage and often used by bisnesses to backup critical data.

Being a sequense acess mediam set from DAT can be slower as compare to random acess devices like HD.

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Input Devices.

1) # Touch Screen.

- Hard Protective layer
- Touch Screen layer
- LCD layer

Touch Screen :- A touch screen is a computer display device with the addition of being an input device. Touch screens are sensitive to the pressure of touch, and rather than using a mouse or keyboard, the user interacts with the screen by directly touching elements on screen with their finger or a stylus pen.

OBR (Optical Barcode Reader)

Barcode readers capture and translate barcodes into strings of numbers and/or letters for translation by computer.

UPC (Universal Product Code)

The universal product code is a barcode symbology that is used worldwide for tracking trade items in stores.

OMR (Optical Mark Reader)

OMR is a technology that enables software to recognize marks made on paper documents, such as forms that contain checkmarks, bubbles, or boxes.

OCR (optical Character Recognition)

OCR is the process that converts an image of text into a machine readable text format.
Ex = if you scan a form or a receipt, your computer saves the scan as an image file.
OCR is mostly use in banking industry

Que Explain the following input device's

1) Touch screen
2) OBR
3) OCR
4) OMR

Ans⇒ Touch screen = A touch screen is a computer display screen that is also an input device. The screens are sensitive to pressure a user interacts with the computer by touching pictures or words screen

OBR = Bar Code Reader is device used for reading bar coded data. bar coded data is generally used in labelling goods, numbering the books It may be a handheld scanner or may be embedded in a stationary scanner.

Bar Code Reader Scans a bar code image, Converts it into alphanumeric value which is then fed to the Computer that bar code reader is connected to.

OCR = OCR is an input device used to read a printed text.
→ OCR Scans the text optically, character by character converts them into a machine readable code and stores the text on the system memory.

OMR = OMR is a special type of optical Scanner used to recognize the type of mark made by pen or pencil. it is used where one out of a few alternatives is to be selected & marked.

It is specially used for checking the answer sheets of examinations having multiple choice questions.

light pen is invented by Ben gurly in (1959)

1) light pen main function is ok or entering.

2) It is use for highliting text.

3) It is a flexible

4) Advantages of light pen is painting, presentation, painting.

Scanner

1) It is use for scanning documents
2) There are 4 types of Scanner
   i) Drum Scanner
   ii) Flatbed Scanner
   iii) Sheetfed Scanner
   iv) Handheld Scanner
3) Scanner invented by Russell A. Kirsch in 1957.

Output Devices

1) printer
2) plotter
3) plasma ~~devices~~ display
4) LCD
5) Digitizer

1) Printer (Charles Babbage in 1822)

There are two type of printer.

i) Impact
ii) Non-Impact

Output Devices.

1) Printer
2) Plotter
3) Plasma display
4) LCD
5) Digitizer

1) Printer :- printers are information and output devices. That allow you to print data on paper or in other words. It is an output devices that creates a hard copy of the processed data or information.

* There are Two types of Printer.

i) Impact printer :- In impact printer character are printed on the ribbon, which is then smashed on the paper. there to print the paper and the hammer or print head strikes on ink ribbon agaist the paper and the character printing.

Ex:- Dot matrix printer, line printer, Daisy wheel printer, Chain printer.

Characteristic of impact printer

- Extremly low Consumable Cost's
- Fairly noisy
- It's perfect for large-scale printing. Bcoz of its in expensive Cost.

1) Non-Impact Printer :- Non-impact printer characters without the use of ribbon. these printers are often known as page printers becoz they print a full page at a Time.

Ex = laser printer, Inkjet printer.

Characteristics of Non-impact printer.

- quicker
- They don't produce much Noise
- Superior quality
- Supports a wide range of fonts and Character sizes.

2) Plotter :- A plotter is a device that prints high-quality graphics in a variety of Colour formats it works in a similar way to a printer, Through it has more advanced feature it is used to print large maps, architectural drawing, large format printing various designs of them internal structure of building machine.

Characteristic of plotter.

-i) large size prints can be taken via plotter

-ii) It is slow and expensive.

3) Plasma Display :- It is also a Flat Panel display but it is based on Plasma display Technology. In a plasma display a small cell is present in between two glass surface and these cells contain some of nobel gases and mercury. So when the electricity supply is passed to both the gas present in the cell converts into plasma and produces UV rays and these rays or light that creates an image.

It is much than an led monitor their resoln of this monitor is also high up to 1920 x 1920. It has a good contrast ratio. high refresh rate. etc.

* First Plasma display developed by Donal Witzer, H. Gene Slottow, Robert Willson in 1960.

4) LCD :- LCD stands for liquid Crystal display it is Flat Panel display technology mainly used in TV's and Computer monitor nowdays. it is used for mobile Phones.

Also these LCD's are Completely different from that old CRT display's it uses liquid Crystals instead of Cathode ray in it's primary Form of operation.

- In LCD it Consists of Millions of Pixels made up of Crystal and assange a rectangular grid. In LCD it has black light's that provide light To each pixel. each Pixel has a red, green and blue Sub-Pixel has that can be Turned on or off. all sub-Pixel are Turned on 100% then it's white.

5) Digitizer : Digitizer are used to convert the analog data format into a digital data format for the application.
By using specialized software or built-in features digitizer can convert your handwritten notes or text into digital text that can be edited searched or shared.
This is particularly useful for taking digital notes or transcribing handwritten documents.

Unit-2

Processor (CPU)

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Processor is Brain of Computer.

1) A Computer processor also called central processing unit or CPU is the brain of Computer.
2) It is hardware component that execute instruction and perform calculation ressary to the programm and operate the Computer System.
3) The CPU's speed measured in gigahertz (GHz), determines how quickly it can execute instructions
4) The CPU processes data by fetching instruction from memory, decoding them, exicuting operation and storing result
5) It contains one or more processing cores each capable of exicuting instruction independly and ller
6) processor is a chip made up of silicon which is made in square shape. this chip controles the whole computer, laptop, mobile's.
   It monitor's all the activity's happing on the Computer. Keeps the information about every activity of H/w and S/w.
7) one second has ability to calculate billions of instruction
8) This it act as a medium b/w us and the Computer it is install very carefully in the motherboard in the form of chip. it get's heated when use continously for a long time.
9) To maintain its heat, a heat sink fan are place over it.

Components of processor:

The processor of a tipical Computer Consist of Several key Control Component that work together to exicute the instruction and perform Calculation this Component are as follow

1) Control Unit :- the Control unit manges and Co-ordinate the CPU operation it Phase instruction from memory decode the data flow b/w CPU & other Component

2) A.L.U :- ALU perform Arithmatic & logical operation on data it can perform basic oprations like like, Add, Sub multi, divi, and Logical oprations (AND or NOT) used in decision making

3) Registor :- Smallest Storage device high speed memory unit in side CPU they temporily hold data

There are many types of registor such as instruction registor (IR), Programm Counter (PC), General Purpose registor such as accumulator and index registor

4) Cache memory = It is a small high speed memory located directly CPU chip. it stores frequently acest data and instruction's to reduce the time needed to acess information.
Cache memory helps to improve over all system performance by providing faster acess to critical data.

It stores data that use repitedly

5) Control Bus :- The control bus is the set of electrical path ways that carry control singnals b/w CPU and other componant's of the computer system.
- control singnal include comandas for reading / writing data, initiating memory transfer and controling instruction Flow.

6) Data Bus :- The data bus is the set of electrical path ways that carry data b/w CPU, memory and other devices connected to the computer
- It allow's CPU to transfer the data to and from memory, IO divices.

7) Clock Generator :- produces electrical singals called Clock pulses. that Synchronize time of opration with in the CPU
- The clock speed measured in Hz determine how quickly the CPU execute instruction and processes data

Features of processors

1) Clock Speed :- Measured in (GHz)
- Clock speed indicate how many cycles per second CPU can execute
- higher clock speed genrally means Faster performance.

2) Cores :- Moden processors have multiple cores (dual core), (Quad core), (hexa core).
- Each core can indipendantly exicute task, allowing for better multi tasking and ller processing.

3) Threads :- Threads are the smallest unit of processing that CPU can handle Some CPU's support Simaltaneous multi threading (SMT), which allows each core to handle multiple treads Simalteously.

4) Cache :- The cache is smaller, high speed memory located inside CPU.
It's Store frequently acess data and instruction's to speed up processing
It Store's Copyes of data from frequently use main Memory location.

5) ISA :- Instruction set Architecher.
ISA define set of instruction that CPU Can execute.
Common ISA include X86, X86-64 (used in most destop processors)

6) TDP :- Thermal Desing Power.
TDP define or indicates maximum amount of heat a CPU is excepted to genrate under maximum load.
It is use to desing Cooling soln. & estimate the power Consumtion.

7) TGPU :- ~~Intel~~ Integrated graphic Processing Unit
Some processors include and integrated GPU with graphic's processing.
This is Common in processors desiga for laptop's and buget dekstop.

8) Fabrication :- The Fabrication processes refers to desing and Struter of and Processor
- It determine the size of transister use in CPU.

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Measured in nm (nanometer)

9) Architecture :- It refers to desing and structure of processor
ex = include intel's core architecture and AMD's zen architecture.
different architecture offer varying Performace, power ifficie & Feature.

10) Bus speed :- The bus speed refer's to the speed at which data travel blw CPU and other Component.
- Such as RAM & motherboard
This Feature Collectively determine the effiency, Performace and Capabilies of processor.

Structure of Instruction

When we save any program and complie it. / Interpeat and then finally it get converted into machine code. (That is micro instruction's which is called set of instruction.

We save all the data and the instruction in memory.

- CPU consist of ALU and CU.

1) To perform ith is Funcation of ALU.
2) CPU is directly connected to set of resistance. we have different types of resistance like Instruction resister, Accumulator / data resister, I/P or O/P resister.
3) CPU works with this resister's.
4) data and instruction present in a memory
5) CPU has to Featch the instruction from memory to perform task.
6) General Format of instruction is

mode : Addresing mode tells address.

opcode : It tells operation.

operand : It tells location of A, B, C either it memory or resister.

- The mixture of above 3 mode instruction
- Now the instruction is in memory, where it is we fetch it and bring it into register.
- We have a specialise register instruction register (IR) where instruction brought, and open it, try to decode it and search for operand.
- Where the operand is, we will bring the operand from their in the accumulator as or data register.
- ALU perform operation their and finally it will give the addition to O/P register.
- O/P register give this data to printer/or monitor and result will print.
- More the addresses maximum the length of instruction then also size of IR increases.

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RISC / CISC

1) RISC

1) Stands for reduced Instruction Set Computer
2)
3) Fixed length instruction format
4) Addressing modes are less.

Characteristics

1) Simpler instruction, hence Simple instruction decoding.
2) Instruction comes under Sized of one word
3) Instruction takes a Single Clock Cycle to get excuted
4) Simple addresing mode's.
5) less data type.

Advantages

1) Simplex instruction. This rise processes use a smaller set of instruction, which makes them essayer to decode and execute quickely.

2) Faster execution: because rise processes have a simplex instruction they can execute instruction fastly than CISC processer.

3) Lower Power Consumption : Risk processor Consume less Power than CISC and they are ideal for portable devices

Disadvantage

1) More instruction required :- Risk processor require more instruction to perform complex task

2) Increase memory usage :- Risk processor require more memory to store additional instruction needed to perform complex task

3) Higher Cost :- Debugging and manufacturing risk processor can be more expensive than CISC.

CISC

1) Stands for Complex Instruction Set Computer.
2) Large number of Instruction Set.
3) Varying Size of instruction.
4) Large number of Addressing mode
5) More pestrill

Characteristics

1) Complex instruction hence Complex decoding
2) Instructions are larger than one word size
3) Instructions may take more than a single clock cycle to get executed
4) less number of general purpose register.
5) More data types.

Advantages

1) Widely use: CISC processor have been in use for a longer time than RISC proce. So that they have larger user base and more at aveliable S/w.

2) Reduced Code size: CISC processor uses complex instruction that can perform multiple operation, reducing the amount of code needed to perform a task

3) Access to memory is fixible because of complex addressing mode. CISC instruction can directly accese memory location.

4) It can execute complex task using fewer lines of codes

5) More memory efficient : because CISC instruction are more complex they require fewer instruction to perform a task, which can result in more memory efficient.

Disadvantage :

1) Slower execution : CISC processes take longer time to execute instruction because they have more complex instruction and hence need more time to decode it.

2) More Complex desinge : They have more complex inst set which makes them more difficult to diesinge and manifucturing

3) Higher Power Consumtion : They Consume more Power than RISC processes because of there more complex instruction set

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Types of processor

1) Single Core

2) dual Core

3) Quad Core

1) Single Core :- This type of CPU was use in early type/versions of Computers

2) As the name Suggest, only one Core avaliable

3) This one Core is responsible for exicution of instruction

4) However it was slow this is because if the user loads more than one application at a time, the Core Cannot processes the new one unless & until the exicution of Current application has been Completed

5) Therefore the major drawback this type of CPU was not Cabe Capable of multi tasking.

6) Another problem was it Could not processes highed application

Ex= Intel 4004 (it was 1st Core CPU)

2) Dual Core CPU :- This type of CPU make use of two Core's, each is responsible for execution of instruction.

2) There four they can execute more than one instruction at a time
3) The Core can handle execution of two instruction (operation) Similatneously there by over coming drawback of Single Core CPU
4) It has ability to do parallel task as each Core has it's own Cache memory.
5) How ever it less robust as compare to Quad Core

Ex = Core 2 Duo E6400.

3) Quad Core CPU :- CPU has four Core

2) It means that the execution becomes enhanced
3) It has ability to execute Multiple task with enhanced speed.
4) For instanstance if the users has opened four applications, the CPU loads all the applications and Similtaneously execute them. The control jumps Jumps From Forth to back to processes the instruction
5) This CPU should be use when users do graphic desining, Video edditing etc.

New

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Internet and WWW

Internet : Internet is a network of network's that is use to interlinked many d/f type of Computers all over the world.

1) Internet is a grobal network of network's

WWW :

Stands For world wide web

- Internet :
Internet is a means of Connecting a Computer to any Computer any where in world.

- WWW :
It is a collection of information which Can be access via internet

- Internet :
It is originated in late 1960's

- WWW :
English scientiest Tim burner's Lee inventad the WWW in 1989

- Internet :
Internet is a super set of WWW

- WWW :
It is a subset of internate

- Internet :-
First version of internet was known as ARPANET (Caddavance research project agency network)

- WWW :-
In the beging WWW is known as NSFNET

- Internet :-
Internet is a Web based

- WWW :-
WWW is a Web based

- Internet :-
It uses IP add

- WWW :-
It uses HTTP

Protocals :

1) TCP/IP :-

→ Transmision Control protocall.
IP = Internet protocall

2) HTTP :
→ Hypertext Transfer protocall.

3) FTP :
→ File Transfer protocall.

Web Pages / HTml

- digital document.
- Tim Berners's lee.
- Created using HTml.

Components of web pages.

- Control (Content wise
  In Content wise, there are 2 types.
  1) Hypertext
  2) Hyperlinks

- Structure wise

1) Page title 2) Header 3) body 4) Nav link 5) Footer

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- Protocols :

1) TCP / IP

- These are set of standards rules that allows different types of Computers to Communicate with each other.

- The IP protocol ensures that each Computer that is Connected to the internet is having a specific Serial no. called the IP address

- Tcp specifies how data is exchanged over internet and how it should be broken into IP packets.

- It's a basic protocol. Call other protocol uses this.

- It also marks sure that the packets have information about source of msg. data, the destination of msg data, the sequence in which msg data should be re-assembled and checks if the msg has been sent Correctly to the specific destination

- The TCP is also known as a Connection-oriented protocol

2) HTTP :-

- Hypertext transfer protocal.
- The protocal is used to transfer hypertexts over the internet and is defined by WWW for information transfer.
- This protocal defines how the information needs to be formatted and transmitted
- It also defines various actions the web browsers should take in response to the calls made to access a particular web page
- Whenever user opens their web browser the user will indirectly use HTTP as this is the protocal that is being used to share text, images and other multimedia files on world wide web.

(Hypertext refers to special format of the text that can contain links to other texts)

→ HTTPS :---- Secure.

- Visiting Pages related to our searched data.

3) FTP (File transfer protocal).

- This protocal is used for transferring files from one system to other.
- This works on a client-server model.
- When a machine requests for file transfer from another machine, the FTP sets up a connection between the two and authenticates each other using their ID & password.

And, the desired file transfer takes place between the machines.

* Web Pages and HTML :-

A webpage is a digital document that is linked to WWW and viewable by anyone connected to internet having web browser.
- It can contain any type of info, text, color graphics, animation, videos, sounds etc.
- A webpages is a document that is written in the HTML. it can be viewed from internet it can be accessed by entering URL on the address bar of web browser.

Components of Web Pages.

Hypertext	Hyperlinks
- It refers to digital text which is more than just text as it can include info. in various media format such as: text, color, graphic, video, animation, video, sound	- It refers to a links from a hypertext file to another such file. A hyperlink can be in the form of a graphics or text, upon clicking where the linked hyperlinks.

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* Structure wise
1) Page title 2) Header 3) body
4) Navigation links 5) Footer.

- HTML :-

- HTML (Hypertext Markup language) is a standard markup language.
- The hypertext defines the links between web pages, and markup is used to defines text documents within tags to structure the web pages.
- It uses tags and atributes to described the structure and formatting of web page.

Example :-

```
<!DOCTYPE html>
<html>
<head>
<title> First HTML Code </title>
</head>
<body>
<h2> Welcome </h2>
<P> Hello world !! </P>
</body>
</html>
```

- Features : easy to learn easy to use. It is Platform independent. Img, Videos and Audios can be added to web Page Hypertext can be added to text. It is markup language.

HTML was created or developed by Tim Bexnex's lee in 1991. First Version of html was HTML 1.0 but first standard Version was HTML 2.0. Published in 1995.

- Currently we are using HTML 5. which is latest and recent Version of HTML.

HTML 1 → HTML 2 → HTML 3 → HTML 4 → HTML 4.1
1993 1995 1997 1999 2012

HTML 5
2014

Advantages :-

- used to build websites
- It is supported by all browsers.
- It can be integrated with other languages like CSS, Javascript.

Disadvantage :

- HTML can only create static. Static webpage for dynamic web pages other languages have to be used.
- A large amount of code has to be written to create a simple web page
- Security feature is not good.

Web Browsers :

The web browser is an application software to explore WWW. It provides an interface bet" the server and the client and requests to the server. It has compiler to render HTML which is used to design a webpage.

- Whenever we search for anything on internet the browser loads a webpage written in html. including text, links, images and other items, such as style sheets and javascript functions.
- The first web browser WWW was invented in the year of 1990 by Tim Berners Lee after this many browsers were invented with various features like Mazilla Firefox, Google, Chrome, Safari, opera etc.

* How does a web browser works?

A web browsers helps to find information anywhere on the internet. It is installed on the Client Computer and request information from the web server Such a type of working model is called a Client Server model.

- The browser receives information through HTTP protocal. To which transmission or data is defined
- When the browser received data from the server it is rendered in html to user readable form and information is displayed on the device screen.

Website Cookies :

- When we visited any website over the internet our web browser stores information about us in small files called Cookies.
- Cookies are designed to remember saftefull information about our browsing history.
- Some more Cookies are used to remember about us like our interests, our browsering patterns etc. websites show us ads based on our interest using Cookies.

Application of Internet :

1) Online Businesses (E-Commerce)
2) Cashless Transactions
3) Education
4) Social Networking
5) Entertainment
6) Job Search
7) Communication
8) Online Banking

- Advantages :

1) Online Banking and Transaction.
2) Education, online jobs, Freelancing
3) Entertainment
4) New Job Roles
5) Best Communication medium
6) Comfort to humans
7) GPS Tracking and google maps.

- Disadvantages :

1) Time wastage
2) Bad impact on health.
3) Cyber Crimes.
4) Effect on Children
5) Spreading Negativity
6) Loss of Personal data.