History of Computer/कम्प्यूटर का इतिहास

Computer :-

Common operating machine purposely used for technological and educational research.

World's first calculating device/विश्व का पहला गड़ना यन्त्र

– Abacus/अवेकस - 2300 BC

Abundant Beards Addition calculation utility system

- **Charles Babbage/चार्ल्स बैबेज**

  Father of computer/कम्प्यूटर का जनक)

  1822 :- Ist Invention - प्रथम आविष्कार

  – Difference Engine/डिफ्रेन्स इंजन

  (A mechanical machine to do complex mathematical calenlotion)

  1837 :- Analytical Engine/एनालिटिकल इंजन

  It was designed to calculate upto 20 decimal places

- **Lady Augusta Ada lovelace/लेडी अगस्ता अड़ा लवलेस**

  1842 :-

  She convinced Babbage to use Binary concept is his Analitical Engine

  बेबेज को अपने इंजन में बाइनरी अवधारणा का उपयोग करने के लिए राजी किया।

  - She wrote different type of program

    इन्होंने विभिन्न प्रोग्राम लिखे
  - Ist computer programmer/प्रथम कम्प्यूटर प्रोग्रामर
  - (Daughter of lord Byron)

- **John-Vohn-Neumann/जॉन, वोन न्यूमैन**

  1945 :-

  He developed the concept of storing program and data in the memory of computer.

  इन्होंने मेमोरी में प्रोग्राम और डाटा स्टोर करने की अवधारणा विकसित की।

  - (Basic Architect of computer)

- **Dr. Herman Hollerith/(डॉ. हरमन होलेरिथ) – 1890**
  - He was the first person to use punch cards in tabulating machine.

    यह पंच कार्ड का प्रयोग करने वाले प्रथम व्यक्ति थे।

- **Ist Electo-Mechanical Computer**

  विश्व का पहला इलेक्ट्रो-मेकैमिकल कम्प्यूटर

Mark-1
⇩
Howard Aiken

- **Ist Electronic Computer of the world**
  विश्व का पहला इलेक्ट्रानिक कम्प्यूटर
  ENIAC :- Electronic Numerical Integrator & Computer
  Developer/आविस्कारक :-
  John-Mauchley/जॉन मौचली
  J. Presper/जे. प्रेस्पर
- **Ist super Computer of the world/विश्व का पहला सुपर कम्प्यूटर**
  — CRAY- I
  Developer/आविस्कारक
  — SEYMOUR CRAY
  Speed - **(Flops)** Floating point Operation per second
- **Ist super Computer of India/भारत का प्रथम सुपर कम्प्यूटर**
  — Param - 8000/परम-8000
  Developer/आविस्कारक
  — Professor Vijay Bhatkar
  Param - Parallel Machine
  Developed by :- [CDAC]
  Centre for development of advance computing.
- **Latest super computer of India/भारत का सबसे आधुनिक सुपर कम्प्यूटर**
  — Param Ananta
  — IIT Gandh-Nagar
- **Fastest Super computer of India/भारत का सबसे तेज सुपर कम्प्यूटर**
  — Param Siddhi/परम सिद्धी
  Speed - 6.5 Petaflops
  Ranked - 63rd/500
- **Fastest super Computer of World/विश्व का सबसे तेज सुपर कम्प्यूटर**
  — "Frontier" - U.S.A.
  Speed - 1102 Petaflops

2nd - Japan – "Fugakul/फुगाकु – 442 Petaflops
3rd - Finland – Lumi/लुमी – 309 Petoflops
4th - Zfaly – Leonardo – 174 Petoflops

Generations of Computer/कम्प्यूटर की पीढ़ियाँ

1. First Generation/प्रथम पीढ़ी (1942 - 1955) :-

Speed mini Second

(i) They used vacume tube as their Main electronic component.

Language low level

Batch processing operating system were used

(ii) They were large in size slow in processing and required large room for installation.

(iii) Magnetic Drums were used for memory had very less storage capacity (Bytes)

(iv) Power consumption was very high and produces lots of heat.

(v) They were hot so accurate and reliable.

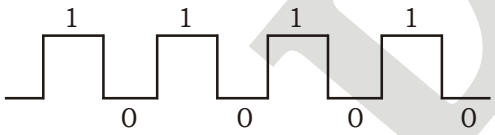
(vi) They used machine level language for programming

(vii) They were very expensive

Application - Record Keeping

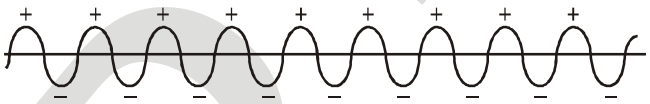
Example - Mark-1

ENIAC, EDUAC, UNIVAC FBM-70, IBM-650

- **Computer understand voltage and current:-**
- **Voltage :-** 

Digital Signal

In semiconductor these type of signals flows.

- **Current :-** 
Analog Signal

In conductor these of signal flows.

- **Characteristics of computer :-**
  (i) Speed
  (ii) Accuracy
  (iii) High storage capacity
  (iv) Versatility
  (v) Diligence
  (vi) No. I.Q

2. Second Generation (1955 - 64) :-

Transistor was introduced at the place of vacume tube

- **Developer of Transistor**
  (i) John Bardeen
  (ii) William Shockely Bellcas

- It was made of [*Germanium semiconductor*]
  Material rather than glass.
- Transistor was *10 Times Faster* than *Vacume tube* and consume 10 Times less Energy
- They were more reliable because they had no part like filament that could burst out.
- It uses *Magnetic Core* as a primary storage.
- Fortran & Cobol high level languages were introduced.

  Formula Translation *Common Business oriented language*
- Example - IBM-1401
- Multiprogramming Operating System
- Assembly Language Ex. IBM-1620 [CDC-3600]
  [IBM-1401] IBM-7094

3. Third Generation (1964 - 75) :-

- I.C. was Introduced (Integrated circuit)
  Developer of I.C. -
  (i) J.S.C. Kilby
  (ii) Robert Noyce
- Magnetic Tape was used for storage
- Smaller in size, better performance and Reliable.
- Less Prove to hardware failure.
- Time sharing and remote processing
  Real Time Operating System
- I.C. is also known as L.S.I (Large scale Integration) More than 10000 component were combined on a single chip.
- C Language was introduced in 3rd Gen.
  Developer of C = "DENIS Ritche"
- Example - IBM-360 = Pascal Basic
  Honeywell 6000 = PDP-II

4. Fourth Generation (1975 - 89) :-

- Microprocessor was introduced in 4th Generation)

  (Intel-4004)
- V.L.S.I. (Very Large Scale Integration)
- High storage capacity (H:D)
- Now P.C. were smaller and Cheaper.
- High Level programming Language were introduced (C, He)

Character, User Interface

G.U.I

- Graphical user Interface was introduced.
- Networking was introduced
- Exp. Apple-II, IBM-4341, De
- Network Distributed Operating System

5. Fifth Generation (1989 - Present) :-

- Microprocessors were known as (U.L.S.I) Ultra-large scale Integration
- Compact, Portable, High Storage Capacity.
- User friendly operating system
- More-powerful applications.
- More reliable and less prone to Hardware failure.

Developer of A.I. → John - McCarthy

Computer is divided into two parks -

Hardware	**Software**
• It is actual Machinery	• It is a collection of programs
• It is tangible	• It is intangible
• It is degradable	• It is not degradable

Booting :

The process of copying the O.S. from secondary memory to primary memory is known as booting.

There are two types of Booting.

(i) Cold Booting – Ist start

(ii) Worm Booting – Restart

Steps of Booting:

(i) POST Operation: (Power On Self Test)

Post is performed and if checks the integrity of hardware. (It checks proper positioning of H.D. RAM, Processor)

(ii) BIOS Execution (Basic Input Output System)

Bios is executed and it activate the peripheral devices.

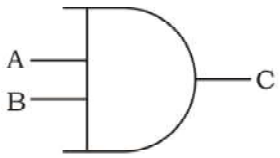
(iii) Boot Strap Loader. It loads the central part of O.S. which is known as kernel.

(iv) Now all control Transfered to O.S.

Logic Gates:

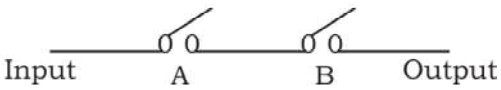
Logic Gates is an electronic circuit that operates on one or more input and procedure produces standard output signals.

(i) **AND Gate:** Formula → C = A * B

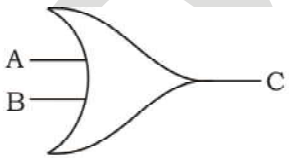


Input		Output
A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

Circuit Diagram

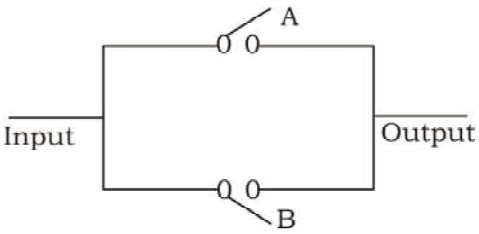


(ii) **OR Gate: Formula:** **C = A + B**

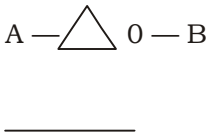


Input		Output
0	0	0
0	1	0
1	0	0
1	1	1

Circuit Diagram

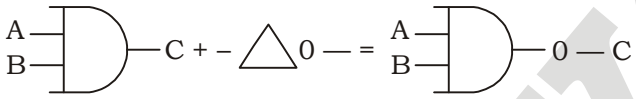


(iii) NOT GATE: Formula - $\boxed{B = \overline{A}}$



A	B
0	1
1	0

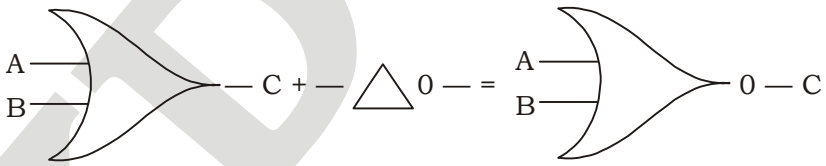
(iv) NAND GATE:



AND + NOT = NAND

Input		Output
A	B	C
0	0	1
1	0	1
0	1	1
1	1	0

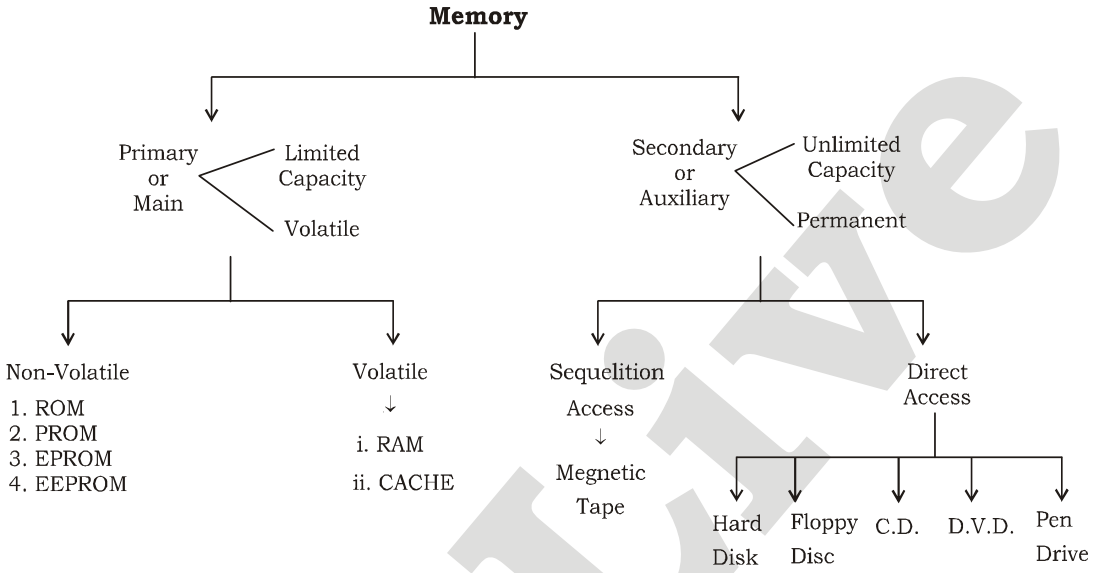
(v) NOR Gate:



OR NOT NOR

Input		Output
A	B	C
0	0	1
0	1	0
1	0	0
1	1	0

NAND & NOR are called universal Gates because using these gates any electronic circuit can be made.



Memory: Memory is a device which is used to store the data or program on temporary or permanent basis.

Register: It is a collection of flip-flops. Flip-flop is normally a digital circuit which store 1 bit of data.

⇒ Volatile and Non. Volatile Memory:

The memory which looses its content on power failure is called volatile and which does not is called Non. Volatile.

Volatile - RAM, CACHE

Non Volatile - H.D

Primary Memory: It is a semiconductor memory and it thereases the speed of computer.

RAM: (RANDOM ACCESS MEMORY)

It is a volatile Memory. It is also known as primary or main memory. It store program and data which are currently being used by processor.

Dynamic RAM: It is widely used. If required refreshing

Static RAM: It does not require refreshing (Expensive & Powerful)

CACHE Memory:

A cache memory is a temporary storage where frequently access data can be stored for rapid access.

Physically it is placed in processor.

 # Non. Volatile Memory :

(i) ROM (Read Only Memory)

It is a silicon chip on mother board on which instructions at the time of manufacture. The permanent instruction stored on ROM is BIOS.

BIOS contain all the instructions to control the Keyboard, Mouse, and No. of miscellaneous functions.

(ii) PROM: (Programmable Read only Memory):

→ Blank ROM, Written by Customer

It is known volatile memory, Instructions can be burn once then it is unalterable. After that it behave, like a ROM.

→ Writing times tokes hours.

(iii) EPROM:

(Erasable Programmable read only Memory)

It is same as PROM but turning process is reversible.

Writing - Electrical Signal

Erasing - U.Y. Rays

Writing fakes minutes

(iv) Electrically erasable program able read only Memory (EEPROM)

 # Virrual Memory: (Logical or Imaginary)

It is extended part of H.D. which behaves like a RAM. It does not exist any where.

 # (MOS: Complimentary Metal Oxide Semiconductur)

It is a Non Volatile Memory and it contain date and time information.

 # Floppy Disc: Thin Shift of Plastic Material with Magnetic Coating

Size = 3½ inch, 5¼ inch, & 8 inch

Capacity + 100 K.B. to 1/44 M.B.

 # C.D. Compact Disc: Capacity = 650 m.B. 700 M.B. 750 M.B.

D.V.D. Digital Versatile Disc: Capacity 4.8 G.B.

Memory Measurement System:

Smallest Unit

1 Bit = (Can Store either 0, or 1)

1 Nibble	= 4 bit	1 Peta Byte	= 1024 T.B.
1 Bite	= 8 bit	1 Exa Byte	= 1024 P.B.
1 K.B.	= 1024 bit	1 Zelta Byte	= 1024 Exa
1 M.B.	= 1024 K.B.	1 Yotta Byte	= 1024 G.B.
1 G.B.	= 1024 K.B.	1 Brohto Byte	= 1024 Y.B.
1 T.B.	= 1024 G.B.	1 Geop Byte	= 1024 B.B.

1 M.B. = 1 Million Byte
1 G.B. = 1 Billion Byte
1 T.B. = 1 Trillian Byte

1 K.B. = 2^{10} Byte
1 M.B. = 2^{20} Byte
1 G.B. = 2^{30} Byte
1 T.B. = 2^{40} Byte
1 P.B. = 2^{50} Byte

Data Communication and Networking:

For Communication we need:

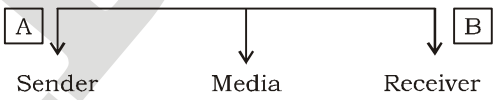
(i) **SENDER** → That sends the Msg.

(i) **SENDER** → That sends the Msg.

(ii) **RECEIVER** → That Receives the Msg.

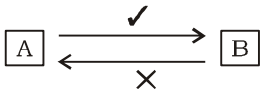
(iii) **MEDIA/ CHANNAL** → That Carries the Msg.

(iv) **PROTOCOL** → Set of Rules and regulations.



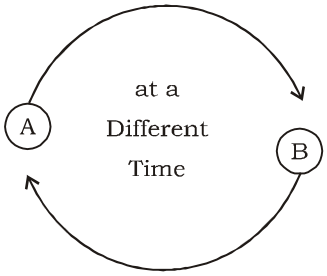
⇒ There are different Modes of Communication:

(i) **Simple Mode:** In this Mode of Transmission Communication take place in one direction.



(ii) **Half - Duplex Mode:**

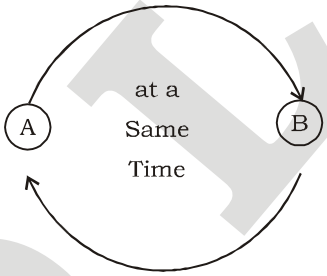
In this Mode of Transmission Communication take place in both direction but one at a time.



Example : Walky - Talky, Fax Machine

(iii) **Full Duplex Mode:**

In this Mode of Transmission Communication take place in both direction simultaneously.



Example : Mobile Internet

Some Network Related Terms:

(i) **Protocol:** A protocol is a set of Rules and Standards that is used by computers to exchange information or data with each other across a network.

(ii) **Node:** In the Network a node is a connection point.

(iii) **NIC (Network Interface Card):** It is a hardware device that connect a computer to a network both functionally and physically.

To communicate we need address:

(i) **MAC Address (Media Access Control)**

→ It is also known as the physical address of computer.

→ It is a unique identification number assigned to a network thereface card. It is of 48 bit or 64 bit.

(ii) **I.P. Address: (Internet Protocol Address)**

→ Logical Address of Computer

→ Unique Address over the Internet

It is of two type:

(i) **Static I.P.** – Permanent / Not change

(ii) **Dynamic I.P.** – Changeable / No permanent

I.P. VERSION

I.P. V4	**I.P. V6**
→ It is of 32 bit	→ It is of 128 bit
→ It is in decimal form Like– 192.168.110.125. We uses (.) to separate the octate	→ It is in Hexa decimal form Like (1AB5 : 19AC : 1B 1D) We uses (:) to Separate

⇒ **I.P. Classes:** There are 5 classes of I.P. Address:

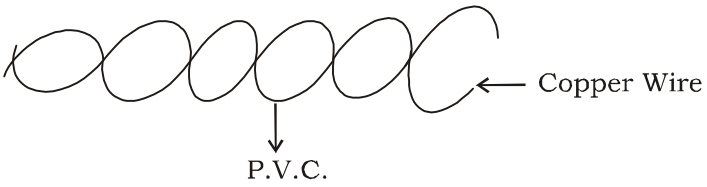
Class	**Range**	**127 → Reserve for Loop-back-Testing**
A →	1 – 126	Public Use
B →	128 – 191	Public Use
C →	192 – 223	Public Use
D →	224 – 239	Reserve for Broad Casting
E →	240 – 255	Reserve for Future Use

For Communication we need Media:

Media

Guided Media	*Unguided Media*
→ Twisted Pair Cable	→ Radio Waves
→ Co-axial Cable	→ Micro Waves
→ Fibre optics	→ Satellite Communication

1. → Twisted Pair Cable:



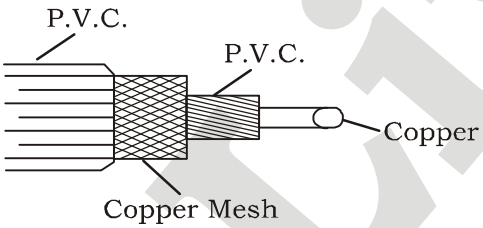
Poly Vinyl Claride

UTP – Unshielded Twisted Pair

STP – Shilded Twisted Pair

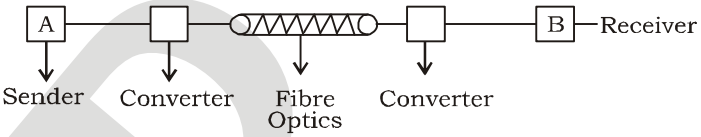
Speed – 1200 bps

2. Co-axial Cable:



Speed – 10 M.B.P.S.

3. Fibre Optica / Optical Fibre.



→ They are Made of Glass Plastic and Silica.

Speed – 1 T.B.P.S.

TYPE OF NETWORK:

(i) Local Area Network

A computer Network is a small Geographical Area like office, building, home etc.

→ It provide high data transfer rate

→ Channel – Twisted Pair

→ Range Few Meters.

(ii) MAN (Metropolitian Area Network):

A man is a large Computer Network that usually spans in a city or large campus.

→ Range – Few K.M.

→ Channel – Co-axial Cable