What is Computer?

- A computer is an electronic device that manipulates data and produce information.
- It has the ability to store, retrieve, and process data.
- A computer can be used to type documents, send email, play games, and browse the Web.
- It can also be used to edit or create spreadsheets, presentations, and even videos.
- The evolution of this complex system started around 1946 with the first Generation of Computer and developing ever since.

Generations of Computer

- Generation in computer terminology is a change in technology a computer is/was being used.
- Initially, the generation term was used to distinguish between varying hardware technologies.
- Nowadays, generation includes both hardware and software, which together make up an entire computer system.
- There are five computer generations known till date.
- Each generation has been discussed in detail along with their time period and characteristics.

Generations of Computer

- In the following table, approximate dates against each generation has been mentioned, which are normally accepted.

S.N.	Generation & Description
1	**First Generation** (Vacuum tube based) The period of first generation: 1946-1959.
2	**Second Generation** (Transistor based) The period of second generation: 1959-1965.
3	**Third Generation** (Integrated Circuit based) The period of third generation: 1965-1971.
4	**Fourth Generation** (VLSI Microprocessor based) The period of fourth generation: 1971-1980.
5	**Fifth Generation** (ULSI Microprocessor based) The period of fifth generation: 1980-onwards.

GENERATION OF COMPUTER

1st Generation :-
(1946 - 1959)

- Use of vacuum tubes.
- Calculations in millisec.
- Big in size.
- Weigh around 30 tones.
- Very costly.
- Less storage capacity due to magnetic drums.
- Less work efficiency.
- Limited programming capabilities.
- Large amount of energy consumption.

Vacuum tubes

Example –
ENIAC, EDVAC, UNIVAC
IBM-701, IBM-650

2nd Generation :-
(1959 - 1965)

- Transistor based.
- Reduced size.
- Lesser energy consumption.
- Assembly language and punch cards used for input.
- Calculations in microsec.
- Better speed.
- Lower cost.
- Better portability.

Example –
Honeywell 400,
IBM 7094, CDC 1604

Transistor

3rd Generation :- (1965 - 1971)

- Based on Integrated Circuits.
- Smaller in size, cheaper, fast, reliable, bigger storage.
- Mouse and Keyboards introduced for input.
- Used an operating system.
- Computations in nanoseconds.

Example –
PDP-8, PDP-11, ICL 2900,
IBM-360, IBM 370

Integrated Circuit

4th Generation :-
(1971 - 1980)

- Microprocessor based.
- Fastest computation.
- Negligible heat generation.
- Less maintenance.
- Smaller in size.
- All types of high level languages used.

Microprocessor

Example –
IBM 4341
DEC 10
STAR 1000
PUP 11

Example
- Desktop
- Laptop
- NoteBook
- UltraBook
- ChromeBook

5th Generation :-
(1980 onwards)

- Artificial intelligence based.
- More reliable.
- Works faster.
- Available in different sizes.
- Computers with more user-friendly interfaces with multi media features.

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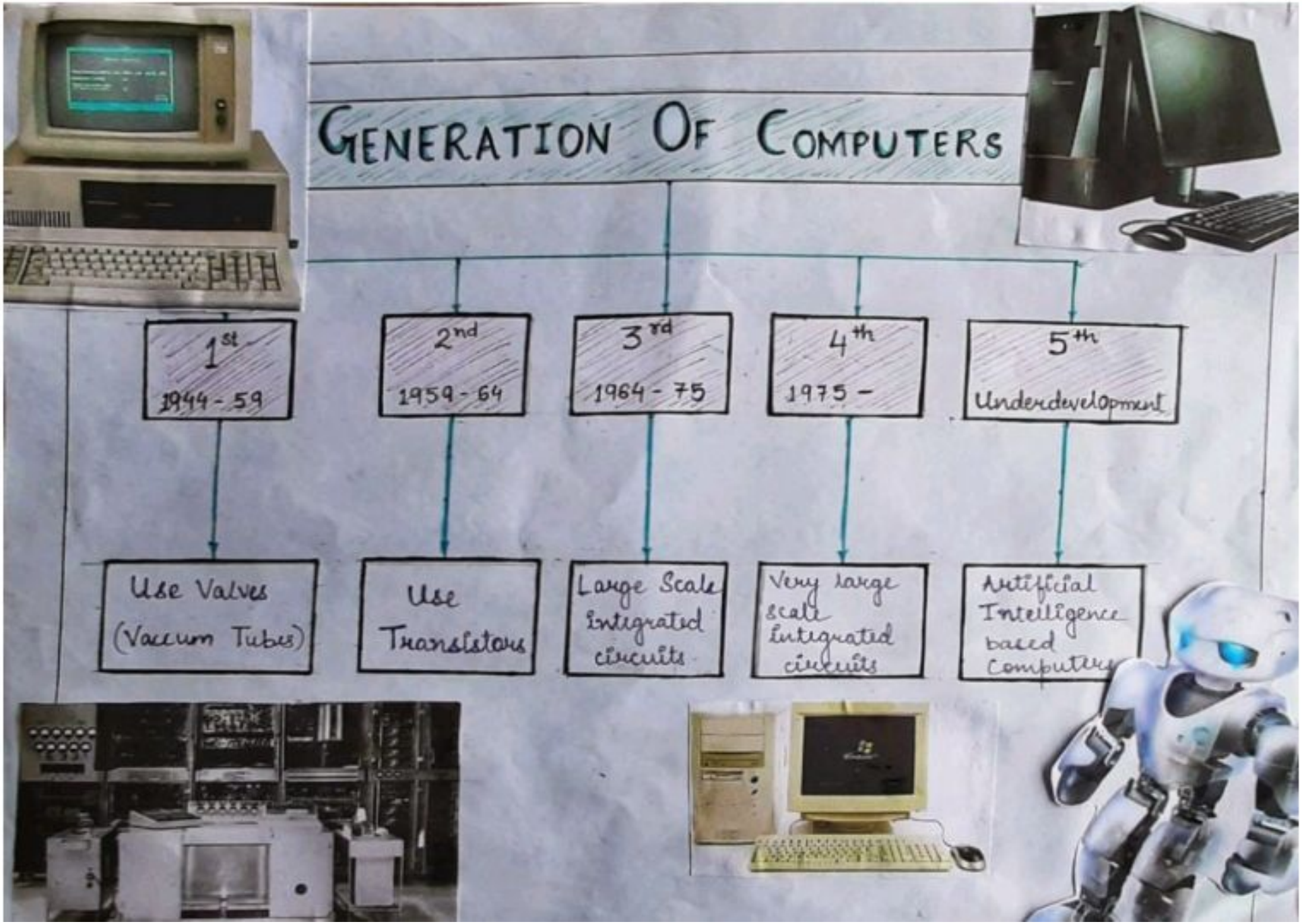
GENERATION OF COMPUTERS
1st
1944 - 59
2nd
1959 - 64
3rd
1964 - 75
4th
1975 -
5th
Underdevelopment
Use Valves (Vacuum Tubes)
Use Translators
Large Scale Integrated circuits
Very large scale Integrated circuits
Artificial Intelligence based Computers

First Generation (1940–1956): Vacuum Tubes

- J.P.Eckert and J. W. Mauchy invented the first successful electronic computer called ENIAC, ENIAC stands for "Electronic Numeric Integrated And Calculator".
- It made use of vacuum tubes which are the only electronic component available during those days and require a large cooling system.
- These computers were very costly and very big in size, weight was about 30 tones and consumed large amount of energy.
- It could store only a small amount of information due to the presence of magnetic drums.
- Very less work efficiency and limited programming capabilities
- Punch cards were used to take inputs.
- Not reliable and constant maintenance is required.
- **Examples:** ENIAC, EDVAC, UNIVAC, IBM-701, and IBM-650.

First Generation

Second Generation (1956–1963): Transistors

- Second generation computers were based on Transistor instead of vacuum tubes.
- Reducing the size of a computer as compared to first generation computers.
- Less energy and not produce as much heat as the first generation.
- Assembly language and punch cards were used for input.
- Low cost than first generation computers.
- Better speed, calculate data in microseconds.
- A cooling system was required.
- **Examples:** IBM 1620, IBM 7094, CDC 1604, CDC 3600, UNIVAC 1108.

Second Generation

Third Generation(1964–1971): Integrated Circuits

- This generation computers were based on Integrated circuits(IC). IC was a single component containing number of transistors.
- Computers were cheaper and small in size as compared to second-generation computers, which was fast and reliable and also improves the performance.
- Computers has big storage capacity.
- Mouse and Keyboard are used for input.
- They used an operating system for better resource management and used the concept of *time-sharing* and *multiple programming*.
- Reduce the computational time from microseconds to nanoseconds.
- **Examples:** IBM-360 series, Honeywell-6000 series, PDP (Personal Data Processor), and IBM-370/168.

Third Generation

Fourth Generation(1972–2010): Microprocessors

- This generation is based on Microprocessor.
- A microprocessor is used in a computer for any logical and arithmetic function to be performed in any program.
- Graphics User Interface (GUI) technology was exploited to offer more comfort to users.
- Small in size as compared to previous generation computers.
- Fastest in computation and size get reduced as compared to the previous generation of computer.
- Heat generated is negligible.
- Less maintenance is required.
- All types of high-level language can be used in this type of computers.
- **Examples:** STAR 1000, CRAY-X-MP (Super Computer), DEC 10, PDP 11, CRAY-1.

Fourth Generation

Fifth Generation(2010-): Artificial Intelligence

- This generation is based on artificial intelligence.
- The aim of the fifth generation is to make a device which could respond to natural language input and are capable of learning and self-organization.
- This generation is based on **ULSI**(Ultra Large Scale Integration) technology resulting in the production of microprocessor chips having ten million electronic component.
- It is more reliable and works faster.
- It is available in different sizes and unique features.
- It provides computers with more user-friendly interfaces with multimedia features.
- **Examples:** Desktop, Laptop, NoteBook, UltraBook, Chromebook

Fifth Generation