Introduction to Computers

UNIT-I

Computers

- The word computer comes from the word "compute", which means, "to calculate"
- Thereby, a computer is an electronic device that can perform arithmetic operations at high speed
- A computer is also called a *data processor* because it can store, process, and retrieve data whenever desired

Characteristics of Computers

1) **Automatic:** Given a job, computer can work on it automatically without human interventions

2) **Speed:** Computer can perform data processing jobs very fast, usually measured in **microseconds** (10^{-6}), **nanoseconds** (10^{-9}), and **picoseconds** (10^{-12})

3) **Accuracy:** Accuracy of a computer is consistently high and the degree of its accuracy depends upon its design. Computer errors caused due to incorrect input data or unreliable programs are often referred to as *Garbage-In-Garbage-Out* (GIGO)

4) **Diligence:** Computer is free from monotony, tiredness, and lack of concentration. It can continuously work for hours without creating any error and without grumbling

5) **Versatility:** Computer is capable of performing almost any task, if the task can be reduced to a finite series of logical steps

6) **Power of Remembering:** Computer can store and recall any amount of information because of its secondary storage capability. It forgets or looses certain information only when it is asked to do so

7) **No I.Q.:** A computer does only what it is programmed to do. It cannot take its own *decision* in this regard

8) **No Feelings:** Computers are devoid of emotions. Their judgement is based on the instructions given to them in the form of programs that are written by us (human beings)

ZEROETH GENERATION

- Man used his fingers, ropes, beads, bones, pebbles and other objects for counting.
- Abacus, Pascaline, Difference & Analytical engines
- Electricity was not yet invented

Computer Generations

Generation	Key kardware technologies	Key Characterstics	Some Representative Systems
First (1942-1955)	Vacuum Tubes	▪ Bulky in size ▪ Highly unreliable ▪ Limited commercial use and costly ▪ Difficult commercial production ▪ Difficult to use	ENIAC
Second (1955-1964)	Transistors	▪ Faster, smaller, more reliable and easier to program than previous generation systems ▪ Commercial production was still difficult and costly	IBM 7030
Third (1964-1975)	IC's	▪ Faster, smaller, more reliable, easier and cheaper to produce ▪ Commercially, easier to use, and easier to upgrade than previous generation systems ▪ Scientific, commercial and interactive on-line applications	IBM 360/370

Generation	Key kardware technologies	Key Characterstics	Some Representative Systems
Fourth (1975-1989)	IC's with VLSI technology	▪ Small, affordable, reliable, and easy to use PCs ▪ More powerful and reliable mainframe systems and supercomputers ▪ Totally general purpose machines ▪ Easier to produce commercially ▪ Easier to upgrade ▪ Rapid software development possible	IBM PC's and its clones
Fifth (1989-present)	IC's with ULSI technology	▪ Portable computers ▪ Powerful, cheaper, reliable, and easier to use desktop machines ▪ Powerful supercomputers ▪ High uptime due to hot-pluggable components ▪ Totally general purpose machines ▪ Easier to produce commercially, easier to upgrade ▪ Rapid software development possible	IBM notebooks

Today Computers

- computers became more affordable
- computers can now be found in homes, schools, offices etc.
- there has been a tremendous improvement in software technology
- different software applications to choose from: word processing, spreadsheets, database management, games and entertainment.
- computer subjects are now being offered not just to college students but even to high school and elementary.
- computers are now used as an aid in teaching math, science etc.