



SYLLABUS

Class – B.Com. V Sem. (Hons.)

Subject – Basic Computer Information Technology-I

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Unit-I	INTRODUCTION TO COMPUTER ORGANIZATION-I : History of development of computer system concepts. Characteristics, capability and limitations. Generation of computer. Types of PC's desktop. Laptop. Notebook. Workstation & their Characteristics.
Unit-II	INTRODUCTION TO COMPUTER ORGANIZATION-II : Basic components of a computer system control Unit, ALU, Input/output function and characteristics, memory RAM, ROM, EPROM, PROM.
Unit-III	INPUT & OUTPUT DEVICES : Input Devices -Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-Code Reader, Voice Recognition, Light Pen, Touch Screen. Output Devices -Monitors Characteristics and types of monitor, Video standard VGA, SVGA, XGA, LCD Screen etc. printer, Daisy wheel, Dot Matrix, Inkjet, Line Printer. Plotter, Sound Card and Speakers.
Unit-IV	STORAGE DEVICES: Storage fundamental primary Vs. secondary, various storage devices magnetic tape, data drives, hard drives, floppy disks, CD, VCD, CD-R, CD-RW, Zip Drive, DVD, DVD-RW.
Unit-V	INTRODUCTION TO OPERATING SYSTEM: Introduction to operating systems, its functioning and types, basic commands of dos & windows operating system. DOS – Introduction, History and Versions of DOS. DOS Basics – Physical structure of disk, drive name, FAT, file & directory structure and naming rules, booting process, DOS system files. DOS commands – Internal DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE etc. External CHKDSK, SCOPE, PRINT, DISKCOPY, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, MODE, ATTRIB, HELP, SYS etc.



UNIT-I

COMPUTER

Computer System is an electronic data processing device which does the following:

first, Accepts **data** such as raw facts, figures, and symbol

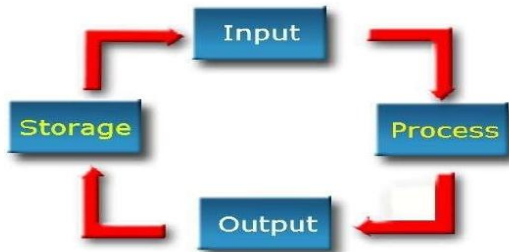
then, Processes data into **information** (Data that is organized, meaningful, and useful)

finally, Produces and stores results.

Information Processing Cycle

The sequences of events, which make up the information processing cycle, are:

- Input
- Processing
- Output
- Storage

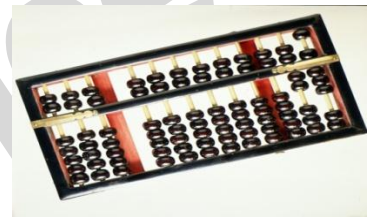


- Parvosh Phulkar

1. **Input**—entering data into the computer.
2. **Processing**—performing operations on the data.
3. **Storage**—saving data, programs, or output for future use.
4. **Output**—presenting the results.

History Of Computers

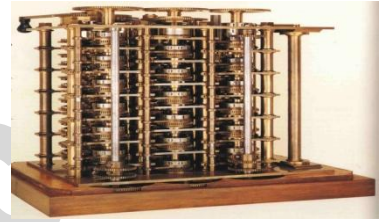
- Before the 1500s, in Europe, calculations were made with an abacus. Invented around 500BC, available in many cultures (China, Mesopotamia, Japan, Greece, Rome, etc.)
- In 1642, Blaise Pascal (French mathematician, physicist, philosopher) invented a mechanical calculator called the Pascaline
- In 1671, Gottfried von Leibniz (German mathematician, philosopher) extended the Pascaline to do multiplications, divisions, square roots: the Stepped Reckoner. None of these machines had memory, and they required



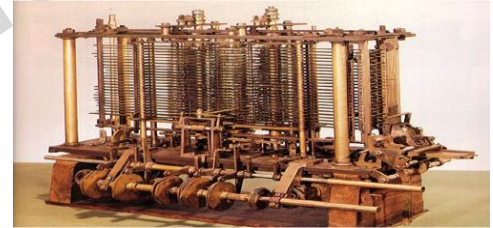


human intervention at each step.

In 1822 Charles Babbage (English mathematician, philosopher), sometimes called the “father of computing” built the Difference Engine



- Machine designed to automate the computation (tabulation) of polynomial functions (which are known to be good approximations of many useful functions)
 - Based on the “method of finite difference”
 - Implements some storage
- In 1833 Babbage designed the Analytical Engine, but he died before he could build it
It was built after his death, powered by steam



Computer Generations

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. But nowadays, generation includes both hardware and software, which together make up an entire computer system.

There are totally five computer generations known till date.

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

First Generation

The period of first generation was 1946-1959.

First generation of computer started with using vacuum tubes as the basic components for memory and circuitry for CPU(Central Processing Unit). These tubes like electric bulbs produced a lot of heat and were prone to frequent fusing of the installations, therefore, were very expensive and could be afforded only by very large organizations.

In this generation mainly batch processing operating system were used. In this generation Punched cards, Paper tape, Magnetic tape Input & Output device were used.

There were Machine code and electric wired board languages used.

The main features of First Generation are:

- ✚ Vacuum tube technology
- ✚ Unreliable
- ✚ Supported Machine language only
- ✚ Very costly



- ✚ Generate lot of heat
- ✚ Slow Input/Output device
- ✚ Huge size

- ✚ Need of A.C.
- ✚ Non portable
- ✚ Consumed lot of electricity

Some computers of this generation were:

- ✚ ENIAC
- ✚ EDVAC
- ✚ UNIVAC
- ✚ IBM-701
- ✚ IBM-650

Second Generation

The period of second generation was 1959-1965.

This generation using the transistor was cheaper, consumed less power, more compact in size, more reliable and faster than the first generation machines made of vacuum tubes. In this generation, magnetic cores were used as primary memory and magnetic tape and magnetic disks as secondary storage devices.

In this generation assembly language and high level programming language like FORTRAN, COBOL was used.

There was Batch processing and Multiprogramming Operating system used.

The main features of Second Generation are:

- ✚ Use of transistors
- ✚ Reliable as compared to First generation computers
- ✚ Smaller size as compared to First generation computers
- ✚ Generate less heat as compared to First generation computers
- ✚ Consumed less electricity as compared to First generation computers
- ✚ Faster than first generation computers
- ✚ Still very costly
- ✚ A.C. needed
- ✚ Support machine and assembly languages

Some computer of this generation were:

- ✚ IBM 1620
- ✚ IBM 7094
- ✚ CDC 1604
- ✚ CDC 3600
- ✚ UNIVAC 1108

Third Generation

The period of third generation was 1965-1971.

The third generation of computer is marked by the use of Integrated Circuits (IC's) in place of transistors. A single I.C has many transistors, resistors and capacitors along with the associated circuitry. The I.C was invented by Jack Kilby. This development made computers smaller in size, reliable and efficient.

In this generation Remote processing, Time-sharing, Real-time, Multi-programming Operating System were used.

High level language (FORTRAN-II TO IV, COBOL, PASCAL PL/1, BASIC, ALGOL-68 etc.) were used during this generation.

The main features of Third Generation are:

- ✚ IC used
- ✚ More reliable
- ✚ Smaller size
- ✚ Generate less heat
- ✚ Faster
- ✚ Lesser maintenance
- ✚ Still costly
- ✚ A.C needed
- ✚ Consumed lesser electricity
- ✚ Support high level language



Some computer of this generation were:

- ✚ IBM-360 series
- ✚ Honeywell-6000 series
- ✚ PDP(Personal Data Processor)
- ✚ IBM-370/168
- ✚ TDC-316

Fourth Generation

The period of Fourth Generation was 1971-1980.

The fourth generation of computers is marked by the use of Very Large Scale Integrated (VLSI) circuits. VLSI circuits having about 5000 transistors and other circuit elements and their associated circuits on a single chip made it possible to have microcomputers of fourth generation. Fourth Generation computers became more powerful, compact, reliable, and affordable. As a result, it gave rise to personal computer (PC) revolution.

In this generation Time sharing, Real time, Networks, Distributed Operating System were used. All the Higher level languages like C and C++, DBASE etc. were used in this generation.

The main features of Fourth Generation are:

- ✚ VLSI technology used
- ✚ Very cheap
- ✚ Portable and reliable
- ✚ Use of PC's
- ✚ Very small size
- ✚ Pipeline processing
- ✚ No A.C. needed
- ✚ Concept of internet was introduced
- ✚ Great developments in the fields of networks
- ✚ Computers became easily available

Some computer of this generation were:

- ✚ DEC 10
- ✚ STAR 1000
- ✚ PDP 11
- ✚ CRAY-1(Super Computer)
- ✚ CRAY-X-MP(Super Computer)

Fifth Generation

The period of Fifth Generation is 1980-till date.

In the fifth generation, the VLSI technology became ULSI (Ultra Large Scale Integration) technology, resulting in the production of microprocessor chips having ten million electronic components.

This generation is based on parallel processing hardware and AI (Artificial Intelligence) software.

AI is an emerging branch in computer science, which interprets means and method of making computers think like human beings.

All the Higher level languages like C and C++, Java, .Net etc. are used in this generation.

AI includes:

- ✚ Robotics
- ✚ Neural networks
- ✚ Game Playing

Development of expert systems to make decisions in real life situations.

Natural language understanding and generation.



The main features of Fifth Generation are:

- ULSI technology
- Development of true artificial intelligence
- Development of Natural language processing
- Advancement in Parallel Processing
- Advancement in Superconductor technology
- More user friendly interfaces with multimedia features
- Availability of very powerful and compact computers at cheaper rates

Types of Computer

Some computer types of this generation are:

- Desktop
- Laptop
- NoteBook
- UltraBook
- ChromeBook

Computer can be broadly classified by their speed and computing power.

Sr. No.	Type	Specifications
1	PC (Personal Computer)	Single user computer system. Moderately powerful microprocessor.
2	WorkStation	Single user computer system. Similar to Personal Computer but have more powerful microprocessor.
3	Mini Computer	Multi-user computer system. Capable of supporting hundreds of users simultaneously.
4	Main Frame	Multi-user computer system. Capable of supporting hundreds of users simultaneously. Software technology is different from minicomputer.
5	Supercomputer	An extremely fast computer which can perform hundreds of millions of instructions per second.

PC (Personal Computer)

- A PC can be defined as a small, relatively inexpensive computer designed for an individual user.
- PCs are based on the microprocessor technology that enables manufacturers to put an entire CPU on one chip.
- Businesses use personal computers for word processing, accounting, desktop publishing, and for running spreadsheet and database management applications.
- At home, the most popular use for personal computers is for playing games and surfing the Internet.
- Although personal computers are designed as single-user systems, these systems are normally linked together to form a network.
- In terms of power, now-a-days High-end models of the Macintosh and PC offer the same computing power and graphics capability as low-end workstations by Sun Microsystems, Hewlett-Packard, and DELL.





WorkStation

- Workstation is a computer used for engineering applications (CAD/CAM), desktop publishing, software development.
- They require a moderate amount of computing power and relatively high quality graphics capabilities.
- Workstations generally come with a large, high-resolution graphics screen, large amount of RAM, inbuilt network support, and a graphical user interface.
- Most workstations also have a mass storage device such as a disk drive, but a special type of workstation, called a diskless workstation, comes without a disk drive.
- Common operating systems for workstations are UNIX and Windows NT.
- Like PC, Workstations are also single-user computers.
- workstations are typically linked together to form a local-area network, although they can also be used as stand-alone systems.



Minicomputer

- It is a midsize computer.
- A minicomputer is a multi-processing system capable of supporting from up to 250 users simultaneously.



Mainframe

- Mainframe is a very large in size and is an expensive computer capable of supporting hundreds, or even thousands, of users simultaneously.
- Mainframe executes many programs concurrently.
- Mainframes support many simultaneous programs execution.



Supercomputer

- Supercomputers are one of the fastest computers currently available.
- Supercomputers are very expensive and are employed for specialized applications that require immense amounts of mathematical calculations (number crunching).
- For example, weather forecasting, scientific simulations, (animated) graphics, fluid dynamic calculations, nuclear energy research, electronic design, and analysis of geological data (e.g. in petrochemical prospecting).





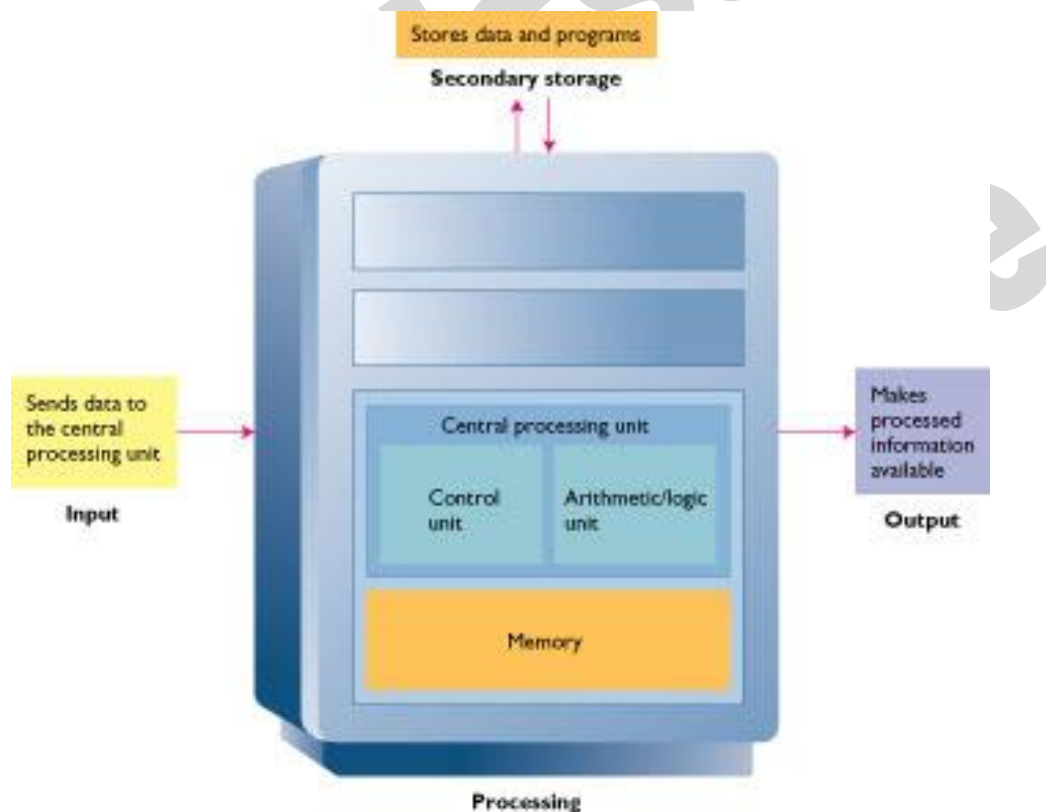
Unit II

All types of computer follows a same basic logical structure and perform the following five basic operations for converting raw input data into information useful to their users

Sr. No.	Operation	Description
1	Take Input	The process of entering data and instructions into the computer system.
2	Store Data	Saving data and instructions so that they are available for processing as and when required.
3	Processing Data	Performing arithmetic , logical operations on data in order to convert them into useful information.
4	Output Information	The process of producing useful information or results for the user, such as a printed report or visual display.
5	Control the workflow	Direct the manner and sequence in which all of the above operations are performed.

Basic components of a computer system

- Input Unit
- Output Unit
- Storage Unit
- Central Processing Unit (CPU)
- Arithmetic and Logic Unit (ALU)
- Control Unit





Input Unit

This unit contains devices with the help of which we enter data into computer. This unit makes link between user and computer.

The input devices translate the human being information into the form understandable by computer.

CPU (Central Processing Unit)

- ❖ CPU is considered as the brain of the computer.
- ❖ CPU performs all types of data processing operations.
- ❖ It stores data , intermediate results and instructions(program)
- ❖ .It controls the operation of all parts of computer.
- ❖ Converts data into information
- ❖ Control center
- ❖ Set of electronic circuitry that executes stored program instructions
- ❖ Two parts
 - **Control Unit (CU)**
- ❖ Part of the hardware that is in-charge
- ❖ Directs the computer system to execute stored program instructions
- ❖ Communicates with other parts of the hardware
 - **Arithmetic Logic Unit (ALU)**
- ❖ Performs arithmetic operations
- ❖ Performs logical operations

RAM

- A **RAM** constitutes the internal memory of the CPU for storing data, program and program result.
- It is read/write memory.
- It is called random access memory (RAM).
- RAM is volatile, i.e. data stored in it is lost when we switch off the computer or if there is a power failure.
- RAM is small , both in terms of its physical size and in the amount of data it can hold.
- Hence a backup uninterruptible power system(UPS) is often used with computers
- Keeps the instructions and data for current program
- Data in memory can be accessed randomly
- Easy and speedy access
- Volatile
- Erased
- Written over



Types of RAM

- Static RAM (SRAM)
- Dynamic RAM (DRAM)



Static RAM (SRAM)

- The word **static** indicates that the memory retains its contents as long as power remains applied.
- Data is lost when the power gets down due to volatile nature.
- SRAM chips use a matrix of 6-transistors and no capacitors.
- Transistors do not require power to prevent leakage, so SRAM need not have to be refreshed on a regular basis.
- Because of the extra space in the matrix, SRAM uses more chips than DRAM for the same amount of storage space, thus making the manufacturing costs higher.
- Static RAM is used as cache memory needs to be very fast and small.

Characteristic of the Static RAM

- It has long data lifetime
- There is no need to refresh
- Faster
- Used as cache memory
- Large size
- Expensive
- High power consumption

Dynamic RAM (DRAM)

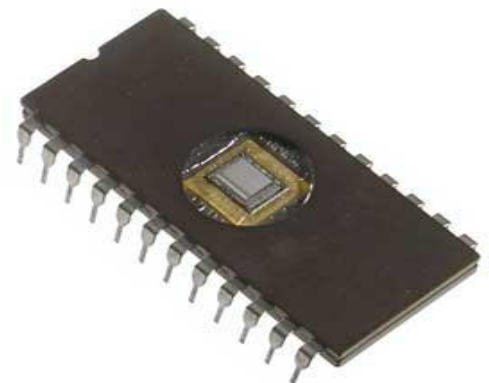
- DRAM must be continually **refreshed** in order to maintain the data.
- This is done by placing the memory on a refresh circuit that rewrites the data several hundred times per second.
- DRAM is used for most system memory because it is cheap and small.
- All DRAMs are made up of memory cells.
- These cells are composed of one capacitor and one transistor.

Characteristic of the Dynamic RAM

- It has short data lifetime
- Need to refresh continuously
- Slower as compared to SRAM
- Used as RAM
- lesser in size
- Less expensive
- Less power consumption

ROM

- **ROM** stands for Read Only Memory.
- We can only read but cannot write on it.
- This type of memory is non-volatile.
- The information is stored permanently in such memories during manufacture.
- A ROM, stores such instruction as are required to start computer when electricity is first turned on, this operation is referred to as bootstrap.
- ROM chip are not only used in the computer but also in other electronic items like washing machine and microwave oven.





Types of ROM

- **MROM (Masked ROM)**
 - ✓ The very first ROMs were hard-wired devices that contained a pre-programmed set of data or instructions.
 - ✓ These kinds of ROMs are known as masked ROMs.
 - ✓ It is inexpensive ROM.

- **PROM (Programmable Read only Memory)**
 - ✓ PROM is read-only memory that can be modified only once by a user.
 - ✓ The user buys a blank PROM and enters the desired contents using a PROM programmer.
 - ✓ Inside the PROM chip there are small fuses which are burnt open during programming.
 - ✓ It can be programmed only once .
 - ✓ It is not erasable.

- **EPROM(Erasable and Programmable Read Only Memory)**
 - ✓ The EPROM can be erased by exposing it to ultra-violet light for duration of up to 40 minutes.
 - ✓ During programming an electrical charge is trapped in an insulated gate region.
 - ✓ The charge is retained for more than ten years because the charge has no leakage path.
 - ✓ For erasing this charge, ultra-violet light is passed through a quartz crystal window (lid).
 - ✓ This exposure to ultra-violet light dissipates the charge.
 - ✓ During normal use the quartz lid is sealed with a sticker.

- **EEPROM(Electrically Erasable and Programmable Read Only Memory)**
 - ✓ The EEPROM is programmed and erased electrically.
 - ✓ It can be erased and reprogrammed about ten thousand times.
 - ✓ Both erasing and programming take about 4 to 10 ms (milli second).
 - ✓ In EEPROM, any location can be selectively erased and programmed.
 - ✓ EEPROMs can be erased one byte at a time, rather than erasing the entire chip.
 - ✓ Hence, the process of re-programming is flexible but slow.

Advantages of ROM

- Non-volatile in nature
- These cannot be accidentally changed
- Cheaper than RAMs
- Easy to test
- More Reliable than RAMs
- These are static and do not require refreshing
- Its contents are always known and can be verified