

B.C.A. SEM-1 (COMPUTER FUNDAMENTALS AND EMERGING TECHNOLOGY)

Sr No.	Topic	Details	Marks	Min Lec.
1	Introduction to computer	<ul style="list-style-type: none"> • Basics of Computers <ul style="list-style-type: none"> • What is Computer • Characteristics of Computer • Data Processing Cycle • Classification of Computer by Data processed • History and Generations of Computers • Classification of Computer by processing Capabilities • Simple Model of Computer <ul style="list-style-type: none"> • Input Devices. • CPU (Central Processing Unit) • Output Devices • Secondary Storage Devices 		
	Internal/External parts used with Computer Cabinet	<ul style="list-style-type: none"> • Introduction to Mother Board • Types of Processors <ul style="list-style-type: none"> – Dual Core, Core 2 Duo, i2, i3, etc.... • Memory structure and Types of Memory <ul style="list-style-type: none"> – RAM (SRAM, DRAM, SD, DDR, etc.). – ROM (ROM, PROM, EPROM, EEPROM, etc.) • Slots <ul style="list-style-type: none"> i. ISA Slots / PCI Slots / Memory Slots • Sockets • Cables <ul style="list-style-type: none"> i. Serial Cable / Parallel Cable / USB Cable • Ports <ul style="list-style-type: none"> i. USB / Serial / Parellel / PS2 • Graphic Cards • Network Card • Sound Card 		
2	Input Devices	<ul style="list-style-type: none"> • Introduction • Types of input Devices <ul style="list-style-type: none"> – Keyboard, Mouse, Trackball, Glide - pad, Game Devices Joystick, etc. – Light pen, Touch Screen, Digitizers and Graphic Table, Mic – Camera, POS Terminal • Types of Scanners <ul style="list-style-type: none"> – OCR, OMR, MICR, OBR 		
	Data Storage	<ul style="list-style-type: none"> • Introduction • Types of Magnetic Storage Devices <ul style="list-style-type: none"> - Floppy Disk / Hard Disk / Magnetic Tape / Magnetic Disks • Storage Mechanism of Magnetic Storage Devices <ul style="list-style-type: none"> – Tracks / Sectors / Clusters / Cylinders 		

		<ul style="list-style-type: none"> • <u>Reading / Writing Data to and from Storage Devices</u> <ul style="list-style-type: none"> i. <u>Seek Time / Rotational Delay – Latency / Access Time /Response Time</u> • <u>Other Storage Devices</u> <ul style="list-style-type: none"> i. <u>USB - Pen Drive / CD / DVD / Blu-Ray Disk etc.</u> • 		
3	Output Devices	<ul style="list-style-type: none"> • <u>Introduction</u> • <u>Types of Output Devices</u> <ul style="list-style-type: none"> – <u>CRT Display Monitor</u> <ul style="list-style-type: none"> ○ <u>Monitor</u> – <u>Non CRT Display Units</u> <ul style="list-style-type: none"> ○ <u>LCD ,LED, Plasma Displays</u> – <u>Other Output Devices</u> <ul style="list-style-type: none"> ○ <u>LCD Projectors , OHP, Speaker</u> • <u>Types of Printers</u> <ul style="list-style-type: none"> i. <u>Impact Printer and Types</u> <ul style="list-style-type: none"> – <u>Dot Matrix Printer, Daisy Wheel printer, Chain Printer, Drum Printer, Band printer, etc.</u> ii. <u>Non Impact Printers and types</u> <ul style="list-style-type: none"> – <u>Ink Jet Printer, Laser Printer, etc.</u> • <u>Plotters</u> <ul style="list-style-type: none"> – <u>Types of Plotters</u> • Other Devices <ul style="list-style-type: none"> – <u>Fascimile (FAX)</u> – <u>OLED (Organic LED)</u> – <u>Headphone</u> – <u>SGD (Speech generating Devices)</u> – <u>COM (Computer Output Microfilm)</u> – <u>Google Glass</u> 		
4	Numbering System and Codes	<ul style="list-style-type: none"> • <u>Introduction to Binary Codes</u> <ul style="list-style-type: none"> - <u>Nibble / Bit / Byte / Carry Bit / Parity Bit / Sign Bit / KB / MB / GB / TB / HB / etc....</u> • <u>Types of Numbering System</u> <ul style="list-style-type: none"> - <u>Binary / Octal / Decimal / Hex-Decimal</u> • <u>Conversion</u> <ul style="list-style-type: none"> • <u>Binary to Octal, Decimal and Hexa-Decimal</u> • <u>Decimal to Binary, Octal and Hexa-Decimal</u> • <u>Octal to Binary, Decimal and Hexa-Decimal</u> • <u>Hexa-Decimal to Binary, Octal and Decimal</u> • <u>Binary Arithmetic</u> <ul style="list-style-type: none"> • <u>Addition / Subtraction(1's Compliment and 2's Compliment) / Division / Multiplication</u> 		

		<ul style="list-style-type: none"> ● Types of Codes → ASCII / BCD / EBCDIC / UniCode ● Parity Check → Event Parity System / Odd Parity System 	
	Languages, Operating Systems and Software Packages	<ul style="list-style-type: none"> ● Introduction - Types of Languages (Assembler / Compiler / Interpreter) - Machine Level Language - Assembly Level Language - High Level Language (3GL, 4GL, 5GL, etc.) ● Types of Operating System - Batch Operating System - Multi Processing Operating System - Time Sharing Operating System - Online and Real Time Operating System ● Types of Software Packages <ul style="list-style-type: none"> ● Word Processing Packages ● Spread Sheet Packages ● Graphical Packages ● Database Packages ● Presentation Packages ● Animation / Video / Sound Packages 	
5	Emerging Technologies and Virus	<ul style="list-style-type: none"> ● Introduction ● Different Communication methods - GIS / GPS / CDMA / GSM ● Communication Devices - Cell Phones / Modem / Infrared / Bluetooth / WiFi ● Virus <ul style="list-style-type: none"> ● Introduction to Virus and related terms ● Origin and History ● Types of Virus ● Problems and Protection from Virus ● Cloud Computing <ol style="list-style-type: none"> a. What is cloud computing? b. Characteristic & service module c. Architecture d. Security & Privacy 	
	Important Terms and Acronyms	<ul style="list-style-type: none"> ● ATM ● Backup / Restore ● Hard Copy / Soft Copy ● Bus / Data Bus ● Buffer and types / Spooling ● Cursor / Pointer / Icon ● E-Mail / Attachment ● CLI / GUI ● Compiler and its types ● Drive / Directory (Folder) / File / Path ● Menu / Popup Menu / Toolbar ● Shutdown / Reboot / Restart ● Syntax / Wild Card Characters 	

		<ul style="list-style-type: none">• <u>Optical Fiber (Fiber Optic)</u>• <u>Net meeting</u>• <u>UPS</u>• <u>Printing Speed (CPS, CPM, LPM, DPI, PPM)</u>• <u>Peripherals</u>		
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Unit -1(Introduction To Computer & Internal/External parts used with Computer Cabinet)

Definition of Computer

- A computer is an electronic device which reduces the mental efforts to solve the problem.
OR
- It is an automatic electronic device for making calculation or controlling operations those are expressible in numerical or logical terms.
- Computer can operate on various kinds of data.

Data Processing Cycle

- The activities processing of data using a computer is called **Data**.



- Data processing consists of three sub activities
 - Capturing the input data
 - Manipulating the data and
 - Managing the output results.
- *Data* is raw material use as input and *information* processed data obtained as output of data processing.

Characteristics of computer

1. Automatic:-

- Computers are automatic machines because once started on a job, they carry on until the job is finished, normally without any human assistance.
- Computers being machines cannot start them selves.
- They cannot go out and find their own problem of coded instructions that specify exactly how a particular job is to be done.
- While the job is in process, the program is stored in the computer, and the parts of the instructions.

2. Speed:-

- A computer is a very, fast device.
- It can perform in a few seconds the amount of work that a human being can do in an entire year.
- If he worked day and night and did nothing else.

- To put it in a different manner, a computer does in one minute what would take a man his entire lifetime.

3. Accuracy:-

- The accuracy of a computer is consistently high and the degree of accuracy of a particular computer depends upon this design.
- But for a particular computer each and every calculation is performed with the same accuracy.

4. Diligence:-

- A computer is free from monotony (variation), tiredness, lack of concentration, etc.
- Computers obviously score over human beings in doing routine type of jobs, which require great accuracy.
- If ten lakhs calculations have to be performed, a computer will perform the ten lakhs calculations with exactly the same accuracy and speed as the first one.

5. Versatility:-

- Versatility is one of the most wonderful things about the computer.
- It prepares the results of particular examination, preparing electricity bills.
- Computer is capable of performing almost any task provided that the task can be reduced to a series of logical steps.

Generation of computers

1. First Generation (1942-55):-

- First generation computers were made up of **vacuum tubes**.
- These computers were of very big sizes, expensive and consume lot of power.
- For example,
 - ENIAC – Electronic Numerical Integrator And Calculator (1943-46)
 - EDVAC – Electronic Discrete Variable Automatic Computer (1946-52)
 - EDSAC – Electronic Delay Storage Automatic Calculator (1947-49)
 - UNIVAC – Universal Automatic Computer (1951 - 54)



Limitations

- They were too large in size requiring rooms for installation.
- Thousands of vacuum tubes that were used so it can produce large amounts. Hence the air-conditioning required.
- High power consumption and short life span.
- Commercial production of these computers was difficult and costly.
- Limited programming capabilities
- Not portable.



2. Second Generation (1955-64):-

- The second generation computers were

- manufactured using **transistors** instead of vacuum tubes.
- Compared to vacuum tubes they are in size and having more life.

Advantages

- They were more than 10 times faster than first generation computers.
- They were much smaller in size than first generation computers.
- Requiring smaller space for installation.
- They accept less power than the first generation computers.
- They were much easier to program and use than the first generation computers.

Limitations

- They had more than one transistors to make this type of computers
- It is very difficult and costly.
- Repairing charge is very costly.

3. Third Generation (1964-75):-

- The third generation was based on IC (Integrated Circuits) technology.
- The IC technology was also known as “microelectronics” technology because it made it possible to integrate larger number of circuit components into very small i.e. less than 5 mm square surface of silicon known as “chip”.



Advantages

- They were much more powerful than the second-generation computers.
- Smaller in size as compared to second-generation computers.
- Less power than the second-generation computers.
- Commercial production was easier and cheaper.
- They are portable.

Limitation

- Third generation computers were located had to be properly air-conditioned.
- Highly sophisticated technology and expensive setup was required for the manufacture of IC chips.

4. Fourth Generation (1975-89):-

- The fourth generation computers were also made by IC technology.
- It is known as Small Scale Integration (SSI).
- After the advance technology in the production of IC chip it was possible to coordinate 100 components on one chip.
- It is known as Medium Scale Integration (MSI).
- Latest and advance IC technology is Very Large Scale Integration (VLSI) in which more than 10 lakhs components can be coordinate on one chip.
- Fourth generation computers were based on LSI technology.



Advantages

- The PCs were much smaller and cheaper as compared to previous generations.
- They consumed much less power than the third-generation computers.
- They had faster and larger primary memory and secondary storage devices as compared to third-generation computers.
- PCs are used for office and home usage.

- The PCs of the fourth generation made computers affordable even by individuals for their personal use at home.

Limitations

- Highly difficult technology required for the manufacture of LSI chips.

➤ Fifth Generation (1989 Onwards):-

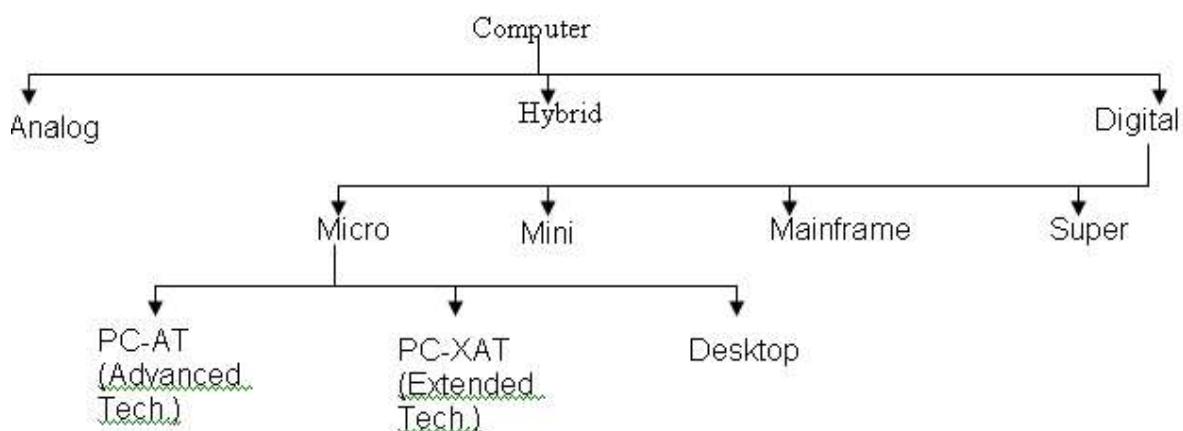
- This generation computers use the ULSI (Ultra Large Scale Integration) for making IC chips.
- Size of this computer is reduced and speed is increased.
- These computers are very powerful and compact as compared to fourth generation computers.



Advantages

- In this generation PCs are much smaller and handy than the PCs of the fourth generation.
- They consume much less power.
- They have faster and larger primary memory and secondary storage devices as compared to other generations.
- They are totally general purpose machines.
- Commercial production of these systems is easier and cheaper.

Classification of Computer by Data processed



Analog Computer

- Analog is a Greek word meaning to find the equality between two units.
- It is a computer that operates on data which is in the form of continuously variable physical quantities such as electrical current, sound waves, etc.
- A computer that uses continuous physical phenomena such as electrical, mechanical, or hydraulic quantities to model the problem being solved.

1. Thermometer		2. Speedometer	
3. Petrol Pump Indicator		4. Multimeter	

Hybrid Computer

- It is a combination of digital and analog computers combining the good qualities of both.
- Hybrid computer has the speed of analog computer and the accuracy and efficiency of digital computer.
- These types of computer are used for the special kind of work. For example, aero plane, radar, submarine.

Digital Computer

- Digital computer is a machine based on digital technology.
- Digital computer gives the output by making necessary calculations from the given data.
- This type of computer cannot do any measurement.
- It is used in various fields. For example, calculator.

Classification of Computer by processing Capabilities

1. Microcomputer

- A micro computer's CPU is a microprocessor, which originated in late 1970's and built around 8 – bit microprocessor chips.
- An improvement on 8 bit chip technology was seen in early 1980s when a series of 16 bit chip namely 8086 and 8088 was introduced by Intel Corporation each one with an advancement over the other.
- Currently processor named Pentium-II is available in the market. Like desktop computer, laptop computer, palmtop computer.



• Mini computers

- A minicomputer is a multi-user computer capable of supporting from 10 to hundreds of users simultaneously.
- Initially microcomputers were 8 bit and 12 bit machines but by 1970s almost all mini computers were 16 bit machines.
- Mini computers speed, memory, size and other characteristics developed and the minicomputer was then used for various standalone applications.
- A 32 minicomputer which was called super mini was introduced.
- It had larger memory and could support more users working simultaneously on the computer in comparison to the previous minicomputers.
- **A midsized computer. In size and power, minicomputers lie between workstations and mainframes. In the past decade, the distinction between large minicomputers and small mainframes has blurred, however, as has the distinction between small minicomputers and workstations. But in general, a minicomputer is a multiprocessing system capable of supporting from 4 to about 200 users simultaneously.**



3. Mainframe computer

- Mainframe computers are generally 32 bit machines or on the higher side.
- These are suited to big organizations to manage high volume application.
- Few of the popular mainframe series are MEDHA, Sperry, DEC, IBM, HP, HCL, etc.
- Mainframe are also used us central host computers in distributed systems.
- There are several organizations such as banks, insurance companies, hospitals, railways etc, that need to process large number of transactions on-line and require computer systems having data storage and processing capabilities.
- Mainframe systems are computer systems that are mainly used for handling the bulk of data and information processing of such organizations.
- Mainframe systems are much bigger and several time more expensive then workstations.
- A typical mainframe system needs a large room with closely monitored temperature.



4. Super Computer

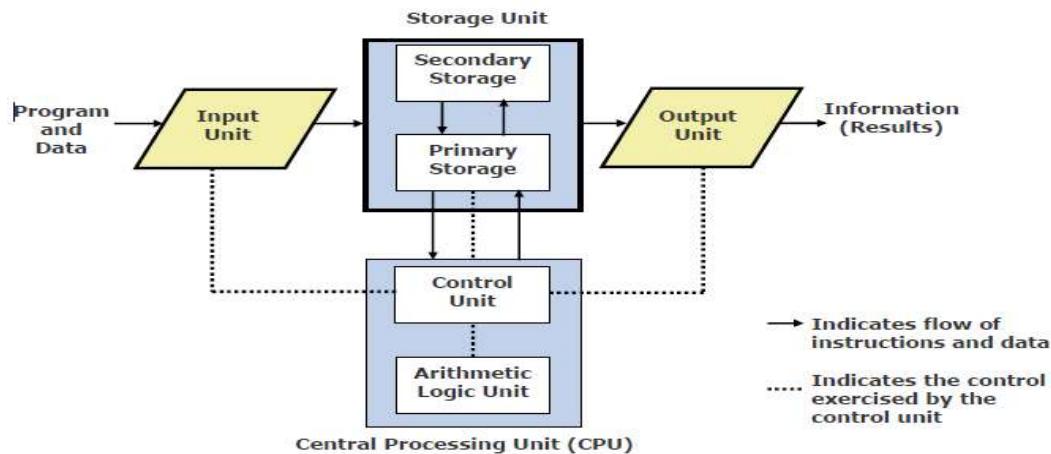
- Super computers are the most powerful and the most expensive computers available at a given time.
- They are primarily used for processing complex scientific applications that require high processing power.
- For example scientists build models of complex processes and stimulate (motivate) the processes on a super computer.
- The super computers are used in petroleum industry, aerospace industry, automobile industry, film and TV industry, etc

Simple Model of Computer

❖ Input Device:-

- All i/p devices are electromechanical devices that accept data from outside world & translates them into a form the computer interpret (i.e. binary).
- There are mainly three type of input devices
 - Standard Input Device
 - Pointing Input Device
 - Special Input device

❖ **CPU (Central Processing Unit):-**



❖ **Input Unit:-**

- An input unit of a Computer system performs the following functions:
 - It accepts (or read) instructions and data from outside word.
 - It converts these instructions and data in computer acceptable form.
 - It supplies the converted instructions and data to the computer system for further processing

❖ **Output Unit:-**

- An output unit of a computer system performs the following functions :
 - It accepts the results produced by the computer, which are in coded form and hence, cannot be easily understood by us.
 - It converts these coded results to human acceptable (readable) form.
 - It supplies the converted results to outside word.

❖ **Storage Device:-**

- The storage unit of a computer system holds (or stores) the following:
 - Data and instructions required for processing (received from input devices)
 - Intermediate results of processing
 - Final result of processing, before they are released to an output device
- There are two types of storage:
 - Primary storage
 - Secondary storage

❖ **Primary storage :-**

- Used to hold running program instructions
- Used to hold data, intermediate results, and result of outgoing processing of job(s).
- Fast in capacity

❖ **Secondary storage :-**

- Used to hold stored program instructions

- Used to hold data and information of stored jobs
- Slowed than primary storage
- Large capacity
- Lot cheaper than primary storage.
- Retains data even without power

❖ **Arithmetic and Logic Unit (ALU) :-**

- Arithmetic and logic unit of a computer system is the place where the actual executions of instructions take place during processing operation.

❖ **Control Unit (CU):-**

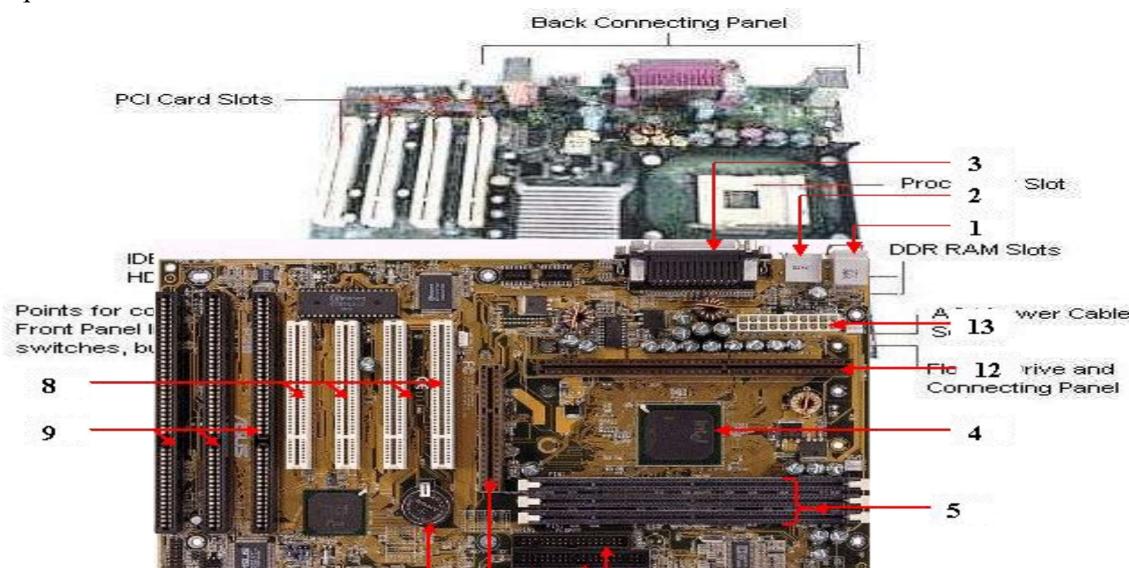
- Control unit of a computer system manages and coordinates the operations of all other components of the computer system.

➤ **Secondary Storage (Auxiliary)**

- Computer systems need to store data on a permanent basis for several days, several months, or even several years.
- So, an additional memory called auxiliary memory or secondary storage is used with most computer systems.
- This section of memory is used to store large volume of data on a permanent basis, which can be partially transferred to the primary storage as and when required for processing.
- Data is stored in secondary storage in the same binary codes as in main storage and is made available to main storage as needed.
- A wide range of devices and media have been developed for use as secondary storage in computer systems.
- The popular item used in today's computer systems are floppy disk, hard disk, CD, DVD, Zip Drive, Pen Drive etc.
- There are three type of secondary devices:: Magnetic Tape, Magnetic Disk, Optical Disk

➤ **Introduction to Mother Board**

The motherboard serves as a single platform to connect all of the parts of a computer together. A motherboard connects CPU, memory, hard drives, optical drives, video card, sound card, and other ports and expansion cards directly or via cables. It can be considered as the backbone of a computer.



1. Mouse & keyboard:

- Keyboard Connectors are two types basically. All PCs have a Key board port connected directly to the motherboard.
- The oldest, but still quite common type, is a special DIN, and most PCs until recently retained this style connector.
- The AT-style keyboard connector is quickly disappearing, being replaced by the smaller mini DIN PS/2-style keyboard connector.
- You can use an AT-style keyboard with a PS/2-style socket (or the other way around) by using a converter. Although the AT connector is unique in PCs, the PS/2-style mini-DIN is also used in more modern PCs for the mouse.
- Fortunately, most PCs that use the mini-DIN for both the keyboard and mouse clearly mark each mini-DIN socket as to its correct use. Some keyboards have a USB connection, but these are fairly rare compared to the PS/2 connection keyboards.

2. USB (Universal serial bus):

- USB is the General-purpose connection for PC. You can find USB versions of many different devices, such as mice, keyboards, scanners, cameras, and even printers.
- A USB connector's distinctive rectangular shape makes it easily recognizable.
- USB has a number of features that makes it particularly popular on PCs. First, USB devices are hot swappable. You can insert or remove them without restarting your system.

3. Parallel port:

- Most printers use a special connector called a parallel port. Parallel port carries data on more than one wire, as opposed to the serial port, which uses only one wire.
- Parallel ports use a 25-pin female DB connector. Parallel ports are directly supported by the motherboard through a direct connection or through a dangle.

4. CPU Chip :

- The *central processing unit*, also called the *microprocessor* performs all the calculations that take place inside a pc. CPUs come in Variety of shapes and sizes.
- Modern CPUs generate a lot of heat and thus require a cooling fan or heat sink. The cooling device (such as a cooling fan) is removable, although some CPU manufacturers sell the CPU with a fan permanently attached.

5. RAM slots:

- Random-Access Memory (RAM) stores programs and data currently being used by the CPU. RAM is measured in units called bytes.
- RAM has been packaged in many different ways. The most current package is called a 168-pin DIMM (Dual Inline Memory module).

6. Floppy controller:

- The floppy drive connects to the computer via a 34-pin *ribbon cable*, which in turn connects to the motherboard. A *floppy controller* is one that is used to control the floppy drive.

7. IDE controller:

- Industry standards define two common types of hard drives: EIDE and SCSI. Majority of the PCs use EIDE drives.
- SCSI drives show up in high end PCs such as network servers or graphical workstations. The EIDE drive connects to the hard drive via a 2-inch-wide, 40-pin ribbon cable, which in turn connects to the motherboard. *IDE controller* is responsible for controlling the hard drive.

8. PCI slot:

- Intel introduced the *Peripheral component interconnect* bus protocol. The PCI bus is used to connect I/O devices (such as NIC or RAID controllers) to the main logic of the computer.
- PCI bus has replaced the ISA bus.

9. ISA slot:

- (Industry Standard Architecture) It is the standard architecture of the Expansion bus. Motherboard may contain some slots to connect ISA compatible cards.

10. CMOS Battery:

- To provide CMOS with the power when the computer is turned off all motherboards come with a battery.
- These batteries mount on the motherboard in one of three ways: the obsolete external battery, the most common onboard battery, and built-in battery.

11. AGP slot:

- If you have a modern motherboard, you will almost certainly notice a single connector that looks like a PCI slot, but is slightly shorter and usually brown. You also probably have a video card inserted into this slot. This is an Advanced Graphics Port (AGP) slot.

12. CPU slot:

- To install the CPU, just slide it straight down into the slot. Special notches in the slot make it impossible to install them incorrectly.
- So remember if it does not go easily, it is probably not correct. Be sure to plug in the CPU fan's power.

13. Power supply plug in:

- The Power supply, as its name implies, provides the necessary electrical power to make the pc operate.
- The power supply takes standard 110-V AC power and converts into 12-Volt, 5-Volt, and 3.3-Volt DC power.

➤ **Features of Motherboard**

A motherboard comes with following features:

- Motherboard varies greatly in supporting various types of components.
- Normally a motherboard supports a single type of CPU and few types of memories.
- Video Cards, Hard disks, Sound Cards have to be compatible with motherboard to function properly
- Motherboards, cases and power supplies must be compatible to work properly together.

Popular Manufacturers

- Intel
 - ASUS
 - AOpen
 - ABIT
 - Biostar
 - Gigabyte
 - MSI
-
- The motherboard is mounted inside the case and is securely attached via small screws through pre-drilled holes.
 - Motherboard contains ports to connect all of the internal components. It provides a single socket for CPU whereas for memory, normally one or more slots are available.
 - Motherboards provide ports to attach floppy drive, hard drive, and optical drives via ribbon cables. Motherboard carries fans and a special port designed for power supply.
 - There is a peripheral card slot in front of the motherboard using which video cards, sound cards and other expansion cards can be connected to motherboard.
 - On the left side, motherboards carry a number of ports to connect monitor, printer, mouse, keyboard, speaker, and network cables.
 - Motherboards also provide USB ports which allow compatible devices to be connected in plug-in/plug-out fashion for example, pen drive, digital cameras etc.

➤ **Processors**

- The brain or engine of the PC is the processor (sometimes called microprocessor), or central processing unit (CPU).
- The CPU performs the system's calculating and processing. The processor is easily the most expensive single component in the system, costing up to four or more times greater than the motherboard it plugs into.
- Intel is generally credited with creating the first microprocessor in 1971 with the introduction of a chip called the 4004.
- Today Intel still has control over the processor market, at least for PC systems. This means that all PC-compatible systems use either Intel processors or Intel-compatible processors from a handful of competitors (such as AMD or Cyrix).
- Processors can be identified by two main parameters: how wide they are and how fast they are.
- The speed of a processor is a fairly simple concept.
- Speed is counted in megahertz (MHz), which means millions of cycles per second—and faster is better! The width of a processor is a little more complicated to discuss because there are three main specifications in a processor that are expressed in width. They are
 - Internal registers
 - Data input and output bus
 - Memory address bus

➤ TYPES OF PROCESSOR

- Nios embedded processor (redirect from Nios (computer processor))
 - Nios was Altera 's first configurable 16-bit embedded processor for its FPGA product-line. For new designs, Altera recommends the 32-bit ... 598 B (55 words) - 10:24, 1 November 2013
- Ivy Bridge (microarchitecture) (redirect from Ivy Bridge (computer processor))
 - Ivy Bridge is the codename for a line of processors based on the 22 nm ... See also: Computer Science | Electronics List of Intel CPU ... 65 KB (8,501 words) - 22:29, 8 April 2014
- ARM architecture (redirect from ARM processor)
 - ARM is a family of instruction set architectures for computer processors based on a reduced instruction set computing (RISC) ... 65 KB (8,957 words) - 22:08, 19 April 2014

- Dual processor
 - In computer architecture , dual processor can refer to two different types of multiprocessing : A computer with two central processing ... 289 B (37 words) - 09:13, 5 October 2013
- Processor Technology
 - Processor Technology Corporation was a personal computer company founded in April 1975 by Gary Ingram and Bob Marsh in Berkeley, California ... 7 KB (1,094 words) - 23:42, 26 October 2013
- Instruction set (redirect from Instruction (computer science))
 - (ISA), is the part of the computer architecture related to programming , including ... the native commands implemented by a particular processor. ... 24 KB (3,274 words) - 14:39, 16 April 2014
- Accumulator (computing) (section Notable accumulator-based computers)
 - In a computer 's central processing unit (CPU), an accumulator is a register in ... However, a number of special-purpose processors still ... 10 KB (1,614 words) - 22:07, 3 March 2014
- Coprocessor (redirect from Co-processor)
 - A coprocessor is a computer processor used to supplement the functions of the primary processor (the CPU). signal processing , string ... 11 KB (1,604 words) - 04:16, 11 March 2014
- Mobile processor
 - A mobile processor is found in mobile computer s and cellphone s. A CPU chip is designed for portable computers, it is typically housed in a ...
 - 887 B (112 words) - 05:04, 22 February 2014
- Notebook processor
 - A notebook processor is a CPU optimized for notebook computer s. One of the main characteristics differentiating notebook processors from ...
 - 3 KB (335 words) - 08:07, 28 January 2014
- Scalar processor
 - Scalar processors represent a class of computer processor s. A scalar processor processes only one datum at a time, with typical data ...
 - 1 KB (165 words) - 16:46, 21 November 2013
- Slipstream (computer science)
 - A slipstream processor is an architecture designed to reduce the length of a running program by removing the non-essential instructions. ...
 - 2 KB (274 words) - 21:19, 3 January 2014

- EasyWriter
 - Easy Writer was a word processor first written for the Apple II series computer in 1979, the first word processor for that platform It was ... 5 KB (750 words) - 02:44, 29 March 2014
- Soma super computer
 - The Soma Super Computer is a SGI supercomputer with 64 processors . It is generally installed in Electronics Engineering school of the ... 686 B (65 words) - 17:28, 12 January 2014
- Wait state
 - A wait state is a delay experienced by a computer processor when accessing external memory or another device that is slow to respond. ... 2 KB (300 words) - 14:51, 6 August 2013
- Parity flag (section x86 Processors)
 - In computer processors the parity flag indicates if the number of set bits is odd or even in the binary representation of the result of ... 2 KB (363 words) - 05:04, 28 January 2014
- Idle (CPU)
 - A computer processor is described as idle when it is not being used by any program . Details: On processors that have a halt instruction that ... 2 KB (255 words) - 12:25, 10 February 2014
- Process (computing) (redirect from Computer process)
 - In computing, a process is an instance of a computer program that is being ... processes to share processors (CPU s) and other system resources. ... 13 KB (1,716 words) - 01:54, 9 March 2014



➤ Memory structure and Types of Memory

- Internal Memory also called Main Memory or Primary Memory consist of fully electronic devices that stores data and program instructions.
- Main memory is divided into many separate locations and each location is identified by an address.
- As each memory location can be referenced randomly and immediately by the used of these address, main memory is also know by the terms IAS (Immediate Access Storage) and RAM (Random Access Memory) (Some common terms related to the memory will be discussed later)

➤ **SOME IMPORTANT TERMS RELATED TO MEMORY :**

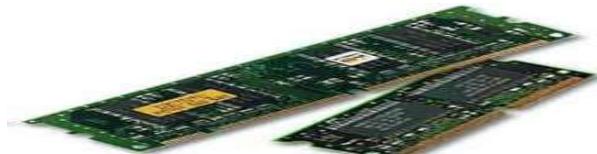
- Main Memory can be volatile or Non-Volatile. In Volatile Memory, the data stored is lost when the power is switched off.
- RAM Chips are volatile. On other hand, Non-Volatile Memory retains its contents even after the power is switched off. ROM chips are non-volatile.
- RAM and ROM chips are implemented as electronic circuits and are known as semiconductor memory.
- Semiconductors memories are storage devices where the storage elements are formed as solid state electronic components on an Integrated Circuit chip.
- The following are some of the more common memory chips :

➤ **RAM(Random Access Memory) :-**

- **RAM** is the internal memory of the CPU for storing data, program and program result. It is read/write memory which stores data until the machine is working.
- As soon as the machine is switched off, data is erased. Access time in RAM is independent of the address that is, each storage location inside the memory is as easy to reach as other locations and takes the same amount of time.
- Data in the RAM can be accessed randomly but it is very expensive. RAM is volatile, i.e. data stored in it is lost when we switch off the computer or if there is a power failure.
- Hence a backup uninterruptible power system (UPS) is often used with computers. RAM is small, both in terms of its physical size and in the amount of data it can hold. RAM is of two types

Static RAM (SRAM)

Dynamic RAM (DRAM)



DRAM

- Dynamic Random Access Memory is a volatile memory that allows fast access to data and is ideal for use as the primary store of computer systems. However, the information is stored as electrical charges and the charges need to be constantly refreshed in order for the data to be maintained.

SRAM

- Static Random Access Memory is also a volatile memory. Once data is written into the chip, it is maintained as long as power is supplied to it; it does not need refreshing. However, SRAM is slower than DRAM and it is also more expensive.

ROM

- Read Only Memory is non-volatile. Data is written by the manufacturer and can not be changed. When programs are stored in ROM, it is referred to as "Firm Ware". ROM-BIOS (Basic Input Output System) used in personal computers for booting up the system is a notable example.

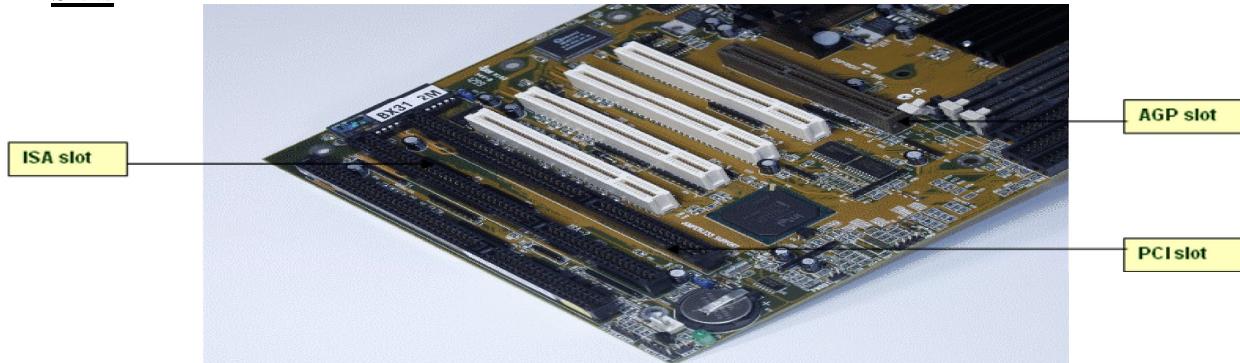
PROM

- Programmable Read Only Memory is a non-volatile memory which allows the user to program the chip with a PROM writer. The chip can be programmed once, thereafter, it cannot be altered.

EPROM & EEPROM

- Erasable Programmable Read Only Memory and Electrically Erasable Programmable Read Only Memory chips can be electrically programmed. Unlike ROM and PROM chips, EPROM chips can be erased and reprogrammed.

➤ Slots



Industry Standard Architecture (ISA)

Peripheral Component Interconnect (PCI)

Advanced Graphic Port (AGP)

Universal serial bus (USB)

➤ Sockets

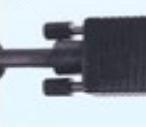
Socket may refer to: In mechanics: Socket wrench , a type of wrench that uses separate, removable sockets to fit different sizes of nuts ...

3 KB (319 words) - 14:42, 21 March 2014

- AC power plugs and sockets
 - AC power plugs and sockets are devices that allow electrically operated equipment to be connected to the primary alternating current (AC) ...
 - 96 KB (14,851 words) - 09:36, 20 April 2014
- Network socket
 - A network socket is an endpoint of an inter-process communication flow across a computer network . most network sockets are Internet sockets. ...
 - 11 KB (1,469 words) - 18:53, 26 March 2014
- CPU socket
 - A CPU socket or CPU slot is a mechanical component(s) that provides mechanical and electrical connections between a microprocessor and a ...
 - 15 KB (1,479 words) - 04:54, 9 March 2014
- Berkeley sockets (section socket())
 - Berkeley sockets (or BSD sockets) is a computing library with an application programming interface (API) for internet socket s and Unix ...
 - 30 KB (4,002 words) - 16:38, 7 April 2014

- Socket wrench
 - A socket wrench is a type of wrench that has a socket attached at one end, usually used to turn a fastener. the ratcheting socket wrench, ...
 - 27 KB (4,431 words) - 20:09, 9 April 2014
- Unix domain socket
 - A Unix domain socket or IPC socket (inter-process communication socket) is a data communications endpoint for exchanging data between ...
 - 2 KB (294 words) - 15:59, 7 February 2014
- Tube socket
 - Tube sockets are electrical sockets into which vacuum tube s (also known as valves) can be plugged, holding them in place and providing ...
 - 32 KB (5,011 words) - 21:22, 10 April 2014
- Orbit (anatomy) (redirect from Eye socket)
 - In anatomy , the orbit is the cavity or socket of the skull in which the eye and its appendages are situated. " the bony socket or it can ...
 - 9 KB (1,140 words) - 16:16, 18 February 2014

➤ **Cables**

FIGURE 2-27 Personal Computer Cables and Connectors			
Connector	Description	Devices	
	Serial DB-9 Connects to serial port, which sends data over a single data line one bit at a time at speeds of 56 Kbps.	Mouse or modem	
	Parallel DB-25M Connects to parallel port, which sends data simultaneously over 8 data lines at speeds of 12,000 Kbps.	Printer, external CD-ROM drive, Zip drive, external hard disk drive, or tape backup device	
	USB Connects to universal serial bus (USB), which sends data over a single data line and can support up to 127 devices. USB-1 carries data at speeds up to 12,000 Kbps; USB-2 at 480,000 Kbps.	Modem, keyboard, joystick, scanner, mouse, external hard disk drive, MP3 player	
	SCSI C-50F Connects to SCSI ("scuzzy") port, which sends data simultaneously over 8 or 16 data lines at speeds between 40,000 Kbps and 640,000 Kbps; supports up to 16 devices.	Internal or external hard disk drive, scanner, CD-ROM drive, tape backup device	
	IEEE 1394 Connects to the "FireWire" port, which sends data at 400,000 Kbps.	Video camera, DVD player	
	VGA HDB-15 Connects to the video port.	Monitor	

➤ **Ports**

- A port is a physical docking point using which an external device can be connected to the computer.
- A port can also be programmatic docking point through which information flows from a program to computer or over the internet.

• **Characteristics :-**

A port has the following characteristics:

- External devices are connected to a computer using cables and ports.
- Ports are slots on the motherboard into which a cable of external device is plugged in.
- Examples of external devices attached via ports are mouse, keyboard, monitor, microphone, speakers etc.

Following are few important types of ports:

Serial Port

- Used for external modems and older computer mouse
- Two versions : 9 pin, 25 pin model
- Data travels at 115 kilobits per second

Parallel Port

- Used for scanners and printers
- Also called printer port
- 25 pin model
- Also known as IEEE 1284-compliant Centronics port

PS/2 Port

- Used for old computer keyboard and mouse
- Also called mouse port
- Most of the old computers provide two PS/2 port, each for mouse and keyboard
- Also known as IEEE 1284-compliant Centronics port

Universal Serial Bus (or USB) Port

- It can connect all kinds of external USB devices such as external hard disk, printer, scanner, mouse, keyboard etc.
- It was introduced in 1997.
- Most of the computers provide two USB ports as minimum.
- Data travels at 12 megabits per seconds
- USB compliant devices can get power from a USB port

VGA Port

- Connects monitor to a computer's video card.
- Has 15 holes.
- Similar to serial port connector but serial port connector has pins, it has holes.



Power Connector

- Three-pronged plug
- Connects to the computer's power cable that plugs into a power bar or wall socket

Firewire Port

- Transfers large amount of data at very fast speed.
- Connects camcorders and video equipment to the computer
- Data travels at 400 to 800 megabits per seconds
- Invented by Apple
- Three variants : 4-Pin FireWire 400 connector, 6-Pin FireWire 400 connector and 9-Pin FireWire 800 connector

Modem Port

- Connects a PC's modem to the telephone network

Ethernet Port

- Connects to a network and high speed Internet.
- Connect network cable to a computer.
- This port resides on an Ethernet Card.
- Data travels at 10 megabits to 1000 megabits per seconds depending upon the network bandwidth.

Game Port

- Connect a joystick to a PC
- Now replaced by USB.

Digital Video Interface, DVI port

- Connects Flat panel LCD monitor to the computer's high end video graphic cards.
- Very popular among video card manufacturers.

Sockets

- Connect microphone, speakers to sound card of the computer

➤ **Graphic Cards:-**

- A video card (also called a video adapter, display card, graphics card, graphics board, display adapter or graphics adapter and sometimes preceded by the word discrete or dedicated to emphasize the distinction between this implementation and integrated graphics) is an expansion card which generates a feed of output images to a display (such as a computer monitor).
- Within the industry, video cards are sometimes called graphics add-in-boards, abbreviated as AIBs, with the word "graphics" usually omitted.
- Virtually all current video cards are built with either AMD-sourced or Nvidia-sourced graphics chips.
- Most video cards offer various functions such as accelerated rendering of 3D scenes and 2D graphics, MPEG-2/MPEG-4 decoding, TV output, or the ability to connect multiple monitors (multi-monitor).

➤ **Network interface controller**

- A network interface controller (NIC, also known as a network interface card, network adapter, LAN adapter or physical network interface and by similar terms) is a computer hardware component that connects a computer to a computer network.
- Early network interface controllers were commonly implemented on expansion cards that plugged into a computer bus. The low cost and ubiquity of the Ethernet standard means that most newer computers have a network interface built into the motherboard.
- Modern network interface controllers offer advanced features such as interrupt and DMA interfaces to the host processors, support for multiple receive and transmit queues, partitioning into multiple logical interfaces, and on-controller network traffic processing such as the TCP offload engine.
- The NIC allows computers to communicate over a computer network, either by using cables or wirelessly.
- The NIC is both a physical layer and data link layer device, as it provides physical access to a networking medium and, for IEEE 802 and similar networks, provides a low-level addressing system through the use of MAC addresses that are uniquely assigned to network interfaces.

➤ **Sound Cards**

- A sound card (also known as an audio card) is an internal computer expansion card that facilitates economical input and output of audio signals to and from a computer under control of computer programs.
- The term *sound card* is also applied to external audio interfaces that use software to generate sound, as opposed to using hardware inside the PC. Typical uses of sound cards include providing the audio component for multimedia applications such as music composition, editing video or audio, presentation, education and entertainment (games) and video projection.
- Sound functionality can also be integrated onto the motherboard, using components similar to plug-in cards.
- The best plug-in cards, which use better and more expensive components, can achieve higher quality than integrated sound.
- The integrated sound system is often still referred to as a "sound card". Sound processing hardware is also present on modern video cards with HDMI to output sound along with the video using that connector; previously they used a SPDIF connection to the motherboard or sound card.