

COMPUTER FUNDAMENTALS

Unit 1: Fundamentals of Computer

Topics covered:

- **Memory**
 - **Primary memory**
 - **Secondary memory**

- **Memory hierarchy**

- **Assignment**

MEMORY

- **Memory:**

- Memory means storage of data and program.
- In computer's memory, both data and programs are stored in binary form i.e. 0 and 1.

- Types of memory:

- There are basically following types of memory:

- 1) Primary memory:**

- Also known as internal memory or main memory
- We can store or retrieve data much faster with primary memory than secondary memory.

- Characteristics:

- Semiconductor memory
- Computer cannot run without it.
- More expensive than secondary memory
- Accessed directly by processing.

- It is further divided into:

- a) RAM

- b) ROM

- a) RAM:**

- Random access memory.
 - It is fastest and expensive memory.
 - It is volatile in nature.

- Types:

- i. DRAM:**

- Dynamic Random access memory.
 - Most personal computers is made of DRAM.
 - Need to be refreshed in less than 1000th of a second.

- ii. SRAM:**

- Static Random access memory.
 - Used in specialized applications.
 - No need to refresh.

- Difference between DRAM and SRAM:

S.NO	DRAM	SRAM
1.	Slower	Faster
2.	Less Expensive	More expensive
3.	Less power consumption	More power consumption
4.	Needs to be refreshed	Do not need to be refreshed.
5.	Made of one transistor and one capacitor	Made of flip flop

- b) ROM:**

- Read Only memory
 - It can only read by the processor.
 - New data cannot be written onto ROM.
 - Non-volatile in nature i.e. these memories do not lose their content on power failure.

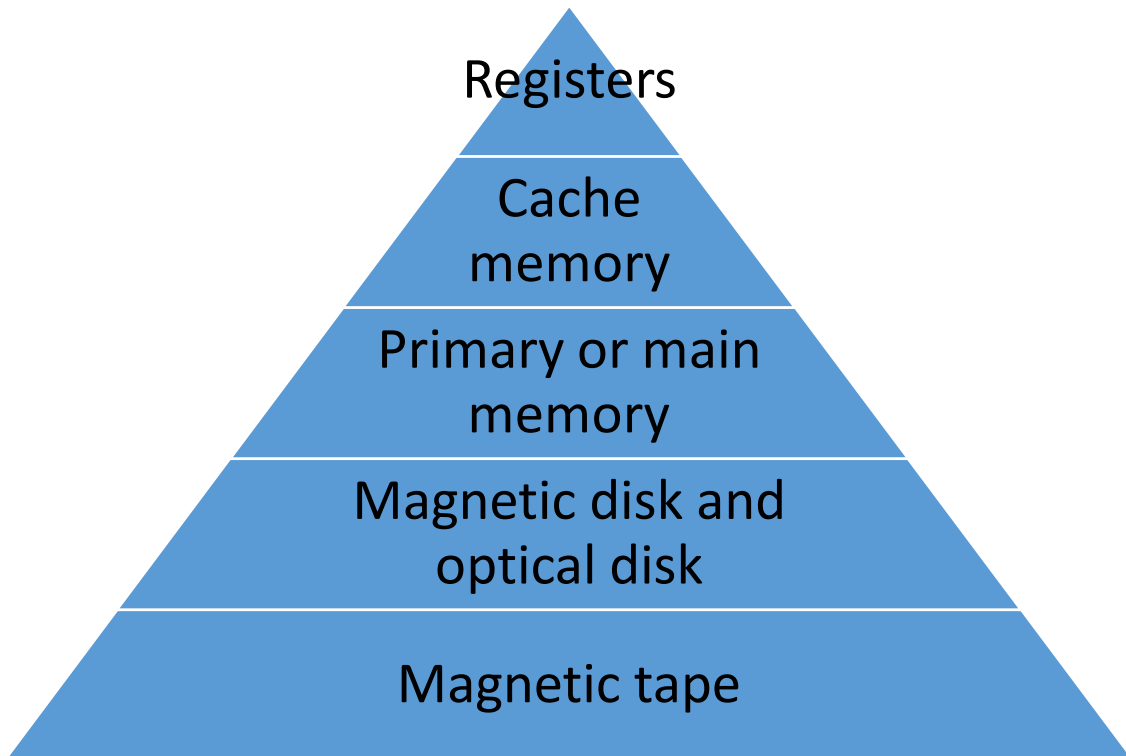
- Types:
 - i. **PROM:**
 - Programmable Read only memory
 - It can be programmed using special hardware device called PROM programmer or PROM Burner.
 - ii. **EPROM:**
 - Erasable programmable Read only memory.
 - Can be programmed time and again by erasing earlier information.
 - iii. **EEPROM:**
 - Electrically programmable Read only memory.
 - Whole memory need not to be erased.

2) Secondary memory:

- Also called Auxiliary memory.
- Also known as storage device of computer.
- Data stored here must be fetched into RAM before processing.
- It is accessed in two ways:
 - a) Sequential access (magnetic tape)
 - b) Direct access (Magnetic disk or optical disk)
 - Types:
 - i. **Magnetic Tapes:**
 - These are plastic tapes with magnetic coating.
 - Inexpensive storage device
 - Can store large amount of data
 - Easy to carry or transport
 - Slow access device
 - Durable, can be written, erased and re-written.
 - Needs dust prevention
 - Suitable for backup storage or archiving.
 - ii. **Magnetic Disk:**
 - Cheap storage device
 - Suitable for frequently read or write data
 - Fast access device
 - Fast access device
 - Can store large amount of data.
 - Eg- Floppy disk, hard disk.
 - Need dust prevention
 - More reliable storage device.

❖ Memory Hierarchy:

- In following diagram:
- a) Cost increases from bottom to top.
- b) Access speed increases from bottom to top
- c) Storage capacity decreases from bottom to top



❖ Note:

A. Cache Memory:

- Fastest memory
- Expensive
- It decreases the miss match between CPU and main memory.

B. Floppy Disk:

- Flat, round single disk.
- Single sided or double sided
- Small and inexpensive
- Floppy Disk Drive is disk drive for floppy disk

C. Hard Disk:

- Consists of one or more platters divided into concentric tracks and sectors.
- Operating system is stored on it.
- Key secondary storage device.
- Performance of computer like speed, boot up, loading of programs to primary memory etc is also dependent on hard disk.

D. Optical Disk:

- Flat and circular disk coated with reflective plastic material that can be altered by laser light.
- Generally slower than Hard disk.

Assignment

Q. Multiple choice questions:

1. Which of the following is used to hold running program instructions?
 - a) Primary storage
 - b) Virtual storage
 - c) Internal storage
 - d) Minor devices
2. Which of the following is non-volatile storage?
 - a) Backup
 - b) Secondary
 - c) Primary
 - d) Cache
3. Which of the following is used in main memory?
 - a) SRAM
 - b) PRAM
 - c) DDR
 - d) DRAM
4. Saving data and instructions to make them readily available is the job of :
 - a) Storage unit
 - b) Cache unit
 - c) Output unit
 - d) Input unit
5. The two basic types of memory in computer are:
 - a) Primary and virtual
 - b) Primary and major
 - c) Primary and secondary
 - d) Minor and major

Q. Fill in the blanks:

1. UNIVAC stands for _____ .
2. EEPROM stands for _____ .
3. BIOS stands for _____ .
4. The language that the computer can understand and execute is called _____.
5. RAM and ROM are _____ memory.

Links: <https://www.youtube.com/watch?v=TQCr9RV7twk>
https://www.tutorialspoint.com/computer_fundamentals/computer_memory_units.htm

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COMPUTER FUNDAMENTALS

UNIT 1: FUNDAMENTALS OF COMPUTER

- **PRINTER**
- **MONITOR**
- **MOUSE**
- **KEYBOARD**
- **DISK**
- **SOUND CARD**
- **VIDEO CARD**
- **MODEM**
- **SPEAKER**
- **ASSIGNMENT**

PRINTER

- A printer is an output device that prints paper documents. It provide hardcopy.
- **Types:** there are mainly two types of printer:
 - A. Impact printer:** They are similar to old typewriters. It works by direct contact of an ink ribbon with paper. These printers are loud while typing. Impact printers are further of following types:
 - a) Daisy wheel printer
 - b) Dot matrix printer
 - B. Non-Impact printer:** These printers do not hit or impact a ribbon to print. They use technologies like laser, electro stat or inkjet. They need less maintenance or repair than impact printer. It is further of following types:
 - a) Inkjet printer
 - b) Thermal printer
 - c) Laser printer
- **Difference between impact and non-impact printer:**

S.No	Impact printer	Non-Impact printer
1.	Produces characters and graphics by striking.	Produces characters and graphics without striking.
2.	It prints by hammering a set of metal pin or character set	Printing is done by depositing ink in any form.
3.	Faster speed	Slower speed
4	Produce noise	Works silently.

MONITOR

- It is also known as screen or visual display unit(VDU).
- It is an output device that displays images, texts or videos.
- Monitors are basically of two types:
 - a) CRT(Cathode ray tube)
 - b) LCD(Liquid crystal display)

MOUSE

- It is handheld hardware input device that controls a cursor in GUI (Graphical User Interface) and can move and select text, icons, files and folders.
- Types:
 - a) Trackball mouse: old technology mouse that has mechanical movement of ball inside. However, dust can easily block the mechanical movement.
 - b) Optical mouse: These are mouse having infrared sensitivity technology. These are in very use now-a-days. No dust can enter and block the track movement. However may have issues in using on crippled surface.
 - c) Wireless optical mouse: These mouse comes with Bluetooth technology that can be used to long range having no wire tangle issues. It is similar to optical mouse but without wire. It can be used in distant but similar to optical mouse it also faces problem with crippled surface.

KEYBOARD

- It is an input device that is very similar to electric typewriter.
- Types:
 - a) Flexible keyboard
 - b) Wired keyboard
 - c) wireless keyboard
 - d) Numeric keyboard
 - e) USB keyboard
 - f) Bluetooth keyboard
 - g) Magic keyboard
 - h) Ergonomic keyboard

DISK

- Also known as diskette.
- It is a hard or floppy round, flat and magnetic platter from where we can read or write information.
- Example: Hard disks, Floppy disks.

SOUND CARD:

- Also known as audio output device, audio card or sound board.
- It is an expansion card for producing sound.
- It can be used to watch movies, play games, and listen to music and other audio related functions.

VIDEO CARD:

- It generates output images to display.
- Also called graphics card.
- It includes a processing unit, memory, a cooling mechanism and connections to a display device.

MODEM:

- It stands for modulator and demodulator.
- These are used for data transfer from one computer network to another computer network through telephone lines.
- It converts information from digital to analog and analog to digital.
- Types: Modems can be categorized in several ways like on the basis of connection line, transmission mode or directional capacity.
 - A. On the basis of connection line:
 - a) 2-wire modem
 - b) 4-wire modem
 - B. On the basis of transmission mode:
 - a) Asynchronous modem
 - b) Synchronous modem
 - C. On the basis of directional capacity:
 - a) Half duplex modem

b) Full duplex modem

SPEAKER:

- These are most common used output device
- Some speakers' works only with computer while other may work with any sound system.
- They are mainly use to produce output audio that can be heard by listener.
- Types:
 - a) Loudspeakers
 - b) Subwoofers
 - c) Ceiling speakers
 - d) Sound bars
 - e) Outdoor speakers

ASSIGNMENT

Q) Find the most appropriate option from following given option:

1. The only language that the computer understands is:
 - a) Binary language
 - b) C language
 - c) Assembly language
 - d) BASIC
2. Which of the following is not a type of Non-Impact printer?
 - a) Laser printer
 - b) Daisy wheel printer
 - c) Thermal printer
 - d) Both a and c.
3. Which of the following is an output device?
 - a) Mouse
 - b) Joystick
 - c) Keyboard
 - d) Speaker
4. One nibble is equivalent to how many bits?
 - a) 8
 - b) 4
 - c) 1
 - d) 2
5. The smallest unit of data in computer is?
 - a) Bit

- b) KB
- c) Nibble
- d) Byte

2. Write the full forms of:

- a) CRT
- b) LCD
- c) BASIC
- d) LED
- e) MODEM
- f) USB
- g) GUI

3. Answer the following:

- a) Explain the working of Laser printer with diagram.
- b) Explain the working of inkjet printer with diagram.
- c) Explain in brief:
 - i) Synchronous and asynchronous modem
 - ii) Wired and wireless keyboard
 - iii) Explain the working of CRT monitor.

Link: <https://www.computerhope.com/jargon/k/keyboard.htm>

<https://www.computerhope.com/jargon/m/mouse.htm>

<https://www.computerhope.com/jargon/s/soundcard.htm>

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