🧠 **Memory Devices – All the devices which are used for storing data are called Memory devices.**

🔹 **1. Primary Memory (Main Memory)**

Used directly by the CPU during operations. Fast but volatile (loses data when power is off).

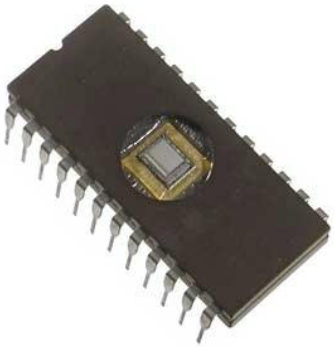
📌 **RAM (Random Access Memory)**

- **Purpose:** Temporarily stores data and programs currently in use.
- **Volatile:** Yes
- **Types:**
    - **DRAM (Dynamic RAM):**
        - Cheaper, slower
        - Needs constant refreshing to retain data
    - **SRAM (Static RAM):**
        - Faster, more expensive
        - Does not need refreshing; used in cache

📌 **ROM (Read Only Memory)**

- **Purpose:** Stores permanent instructions (firmware) like BIOS
- **Volatile:** No (data is retained after power-off)
- **Types:**
    - **PROM (Programmable ROM):**
        - Can be programmed once after manufacturing
    - **EPROM (Erasable PROM):**
        - Can be erased using UV light and reprogrammed

- **EEPROM (Electrically Erasable PROM):**
  - Can be erased and reprogrammed electrically; used in modern BIOS



🔹 2. Secondary Memory (Storage Devices)

Used for long-term data storage; slower but non-volatile.

💾 Hard Disk Drive (HDD)

- **Technology:** Magnetic disks
- **Capacity:** High (up to several TBs)
- **Speed:** Slower than SSD
- **Use:** Desktop PCs, servers

⚡ Solid State Drive (SSD)

- **Technology:** Flash memory (no moving parts)
- **Speed:** Faster than HDD
- **Durability:** More shock-resistant
- **Use:** Laptops, high-performance systems

🔹 3. Cache Memory

Small, high-speed memory located close to the CPU to store frequently accessed data.

- **L1 Cache:**
  - Fastest, smallest, located inside CPU
- **L2 Cache:**
  - Larger than L1, slightly slower
- **L3 Cache:**
  - Shared among CPU cores, largest but slowest among caches

Check this YouTube video link - Inside a cpu

🔹 **4. Removable/Portable Storage**

🔌 **USB Flash Drive**

- **Type:** Solid-state
- **Portability:** Very high
- **Use:** Quick file transfers, bootable media

💿 **Optical Disks (CD/DVD/Blu-ray)**

- **Technology:** Laser read/write
- **Types:**
    - **CD-ROM (Read-Only)**
    - **CD-R/CD-RW (Writable/Rewritable)**
    - **DVD & Blu-ray:** Higher capacities than CDs

📊 **Memory Hierarchy (Speed vs. Capacity)**

From fastest to slowest (and most expensive to cheapest per GB):

Registers > Cache > RAM > SSD > HDD > Optical Disk