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Storage Devices

CT Preparation for Std. IV

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Overview of Storage Devices

A storage device is hardware that stores digital data temporarily or permanently, enabling a computer to boot, run applications, and retain files. Without storage devices, a computer couldn't retain instructions or results of computations outside of immediate processing.

Categories of Storage Devices

Computer storage divides into three main categories:

- **Primary Storage**: Internal memory directly accessible by the CPU; typically, faster but smaller in capacity.
- **Secondary Storage**: External or internal devices used for long-term, non-volatile data retention.
- **Tertiary Storage**: Large-scale or automated systems for archival and backup, often requiring manual or robotic intervention.

Each category serves different performance, capacity, and permanence needs.

Primary Storage Devices

Primary storage resides within the computer system and interfaces directly with the CPU. It includes:

- RAM (Random Access Memory): Volatile memory for active data and program instructions. All data is lost when power is off.
- ROM (Read-Only Memory): Non-volatile memory containing firmware and boot instructions; data persists without power.
- Cache Memory and Registers: Ultra-fast, small-capacity storage embedded in the CPU to accelerate data access.

Primary storage is essential for running applications and is characteristically smaller (1 GB–64 GB for RAM) but very high in speed.

Secondary Storage Devices

Secondary storage offers permanent data retention external to the CPU with moderate to large capacities:

- Hard Disk Drives (HDDs): Non-volatile magnetic disks with capacities from 500 GB up to 4 TB+, low cost per gigabyte, but susceptible to mechanical wear and slower access speeds (e.g., 7.2 K RPM).

- Solid State Drives (SSDs): Flash-based non-volatile storage with faster read/write speeds, no moving parts, and capacities ranging from 128 GB to multiple terabytes.
- USB Flash Drives and Memory Cards: Portable flash-based storage from 8 GB to 512 GB for file transfer and backup.
- Optical Discs (CD/DVD/Blu-ray): Laser-based media holding 700 MB–100 GB suitable for distribution and archival.

Secondary devices balance capacity, durability, and cost for everyday file storage and backups.

Tertiary Storage Devices

Tertiary storage systems automate deep-archive and backup functions, with data rarely accessed:

- Magnetic Tape Libraries: High-capacity sequential media (tens to hundreds of TB) managed by robotic systems for long-term archival.
- Cloud/Object Storage Services: Virtualized off-site storage providing elastic capacity, data replication, and on-demand retrieval via the internet.

Multiple-Choice Questions on Storage Devices

1. Which of the following storage devices is volatile?
   A. ROM
   B. HDD
   C. RAM
   D. SSD
2. Which device contains no moving parts?
   A. HDD
   B. SSD
   C. Magnetic Tape
   D. Optical Disc
3. Which storage medium uses laser technology to read and write data?
   A. USB Flash Drive
   B. SSD
   C. Optical Disc
   D. Magnetic Tape
4. What does “SSD” stand for?
   A. Solid Stage Drive
   B. Solid State Drive
   C. Static Storage Device
   D. Sequential Storage Disk
5. Which storage device typically offers the highest capacity at lowest cost per gigabyte?
   A. SSD
   B. RAM
   C. HDD
   D. Cache Memory

6. Which of these is primarily used for long-term archival and requires robotic or manual loading?
    A. Magnetic Tape Library
    B. USB Flash Drive
    C. RAM
    D. Cache Memory
7. Which of the following provides the lowest data access latency?
    A. Registers
    B. HDD
    C. Magnetic Tape
    D. Optical Disc
8. An external, portable flash-based device commonly used for file transfer is called:
    A. SSD
    B. USB Flash Drive
    C. HDD
    D. Magnetic Tape
9. Which primary storage is non-volatile and typically holds firmware or boot instructions?
    A. RAM
    B. ROM
    C. Cache Memory
    D. Optical Disc
10. For enterprise-scale off-site backups with elastic capacity and replication, which solution is most appropriate?
    A. Local HDD Array
    B. Magnetic Tape Library
    C. Cloud/Object Storage
    D. USB Flash Drive

Answer Key

1	2	3	4	5
C | RAM	B | SSD	C | Optical Disc	B | Solid State Drive	C | HDD

Answer Key

6	7	8	9	10
A | Magnetic Tape Library	A | Registers	B | USB Flash Drive	B | ROM	C | Cloud/Object Storage

THE END

This part is from Text Book

Give the names of the following storage devices.

1	It is the memory device of the computer fixed inside the CPU box.	**Hard disk**
2	A small, sturdy device used to store a large amount of data.	**Pen drive**
3	It is a compact, round and shiny storage device.	**CD**
4	This device contains the main memory unit of a computer.	**CPU**
5	This type of storage disk can store data on both sides.	**Blu-ray disk**

Expand the following.

KB	Kilobyte
MB	Megabyte
GB	Gigabyte
CD	Compact disk
DVD	Digital Video Disk

Fill in the blanks.

1. The smallest unit of computer memory is a bit.
2. A Blu-ray disk can store data up to 254 GB.
3. A CD is a compact and convenient way of carrying data from one place to another.
4. The hard disk is fixed inside the hard-disk drive of the CPU.

Will be continued…….