JSS1 DIGITAL TECHNOLOGY

Topic: Basic Computer Hardware Components II — Storage Units

Meaning of Computer Storage: Computer storage is the process of keeping data, information and instructions in a computer so that they can be used immediately or in the future.

Types of Computer Storage: Computer storage is commonly divided into two major categories:

Primary Storage: Primary storage is the computer's main memory. It holds data and instructions that the processor needs to access directly while the computer is working.

Examples include: a) Random Access Memory (RAM) **b)** Read-Only Memory (ROM)

Characteristics of primary storage

1. It is directly accessible to the processor.
2. It is used to hold instructions and data needed by the computer.
3. It is generally faster to access than secondary storage.
4. It usually has less capacity than secondary storage.
5. Some types, such as RAM, lose their contents when power is switched off, while others, such as ROM, retain their contents.

Secondary Storage: Secondary storage is used to keep data, programs and information for future use, even when the computer is switched off. Examples include:

a) Hard Disk Drive (HDD) b) Solid-State Drive (SSD) c) USB flash drive d) Memory card e)CD and DVD

Characteristics of secondary storage

1. It retains saved data when the power is switched off.
2. It is suitable for storing documents, photographs, videos and applications.
3. It generally offers greater storage capacity than primary memory.
4. It is usually slower to access than RAM.
5. It allows users to keep their files for a long time, provided the device remains functional and the data is not lost or damaged.

Examples of Secondary Storage:

Hard Disk Drive (HDD): A Hard Disk Drive (HDD) is a storage device that uses rotating magnetic disks to store digital data.

B. USB Flash Drive: A USB flash drive is a small, portable storage device that uses flash memory and connects to a computer through a USB port.

C. Solid-State Drive (SSD): An SSD stores data using flash memory and has no moving mechanical parts. It is commonly used to store the operating system, programs and files. It is generally faster than a traditional HDD.

D. Memory Card: A small storage device used in phones, cameras and other compatible electronic devices to store photographs, videos and other files.

Differences Between Primary and Secondary Storage

Primary storage	Secondary storage
Examples include RAM and ROM.	Examples include HDD, SSD and flash drive.
Directly accessible to the processor.	Accessed through the computer's storage system.
Generally faster to access.	Generally slower than RAM.
Often has lower capacity.	Often has higher capacity.
RAM loses its contents when power is off.	Normally retains saved data without power.
Used for working data and important system instructions.	Used for keeping files, applications and other data.

Important note: RAM and ROM behave differently. RAM is normally volatile, while ROM is non-volatile. Therefore, it is incorrect to say that all primary storage loses its data when the computer is switched off.

Storage Measurements: Computers store data in digital form. Storage measurements tell us how much data a computer's memory or storage device can hold. The common units are bit, byte, kilobyte, megabyte, gigabyte and terabyte.

A. Bit: A bit is the smallest basic unit of digital data.

B. Byte: A byte is a group of 8 bits.

C. Kilobyte (KB): A kilobyte is a unit used to measure relatively small amounts of data. 1 KB is often treated as approximately 1,000 bytes. In binary-based measurements, 1 KiB equals 1,024 bytes.

D. Megabyte (MB) A megabyte is larger than a kilobyte.

E. Gigabyte (GB): A gigabyte is larger than a megabyte.

F. Terabyte (TB):A terabyte is larger than a gigabyte.

Storage conversion table

For introductory computer studies, schools commonly use the following binary-based conversion rules:

Unit	Equivalent
1 byte (B)	8 bits
1 kilobyte (KB)	1,024 bytes
1 megabyte (MB)	1,024 KB
1 gigabyte (GB)	1,024 MB
1 terabyte (TB)	1,024 GB

Examples

Example 1: How many bits are in 1 byte?

Solution:

1 byte = 8 bits.

Answer: 8 bits.

Example 2: How many bytes are in 2 KB?

Using 1 KB = 1,024 bytes:

2 × 1,024 = 2,048 bytes.

Answer: 2,048 bytes.

Example 3: How many KB are in 3 MB?

Using 1 MB = 1,024 KB:

3 × 1,024 = 3,072 KB.

Answer: 3,072 KB.

Example 4: How many MB are in 2 GB?

Using 1 GB = 1,024 MB:

2 × 1,024 = 2,048 MB.

Answer: 2,048 MB.

Example 5: How many GB are in 4 TB?

Using 1 TB = 1,024 GB:

4 × 1,024 = 4,096 GB.

Answer: 4,096 GB.

TICKET OUT

LIST 5 IMPORTANCE OF DATA STORAGE