

3.1 Storage Devices

Syllabus 2026 - 2028

WHAT YOU NEED TO KNOW

- Characteristics, uses, advantages and disadvantages of storage devices: magnetic, optical and solid-state
- Magnetic: fixed and portable magnetic hard drives, magnetic tape drives
- Optical: CD, DVD and Blu-ray drives
- Solid-state: fixed and portable solid-state drive (SSD), pen drive, flash drive

A **storage device** is the hardware that reads data from and writes data to a storage medium. The **medium** is what the data is stored on (for example a disc or tape). Backing storage keeps data permanently, so it is still there when the power is off.

Magnetic storage devices

Type	Characteristics and uses	Advantages	Disadvantages
Fixed magnetic hard disk drive (HDD)	Spinning magnetic platters with read-write heads, built into the computer. Used to store the operating system, programs and files.	Very large capacity; low cost per gigabyte; fast access to data; reliable for everyday use	Moving parts can wear out or be damaged by knocks; slower than SSD; uses more power; noisy; heavier
Portable magnetic hard drive	A hard drive in a case, connected by USB. Used for backups and moving large amounts of data.	Large capacity; cheap per gigabyte; easy to carry; good for backups	Easily damaged if dropped; needs a USB port and sometimes power; slower than SSD; can be lost or stolen
Magnetic tape drive	Reads and writes data on a long reel of magnetic tape, one section after another (serial access). Used for backups and archiving at large organisations.	Very cheap per gigabyte; huge capacity; tapes last a long time; good for backup	Very slow to access data (serial access); cannot find a file directly; needs special equipment; not for everyday use

Optical storage devices

Type	Characteristics and uses	Advantages	Disadvantages
CD drive	Uses a laser to read and write pits and lands on a CD. Used for music, software, and small backups. Types: CD-ROM (read only), CD-R (write once), CD-RW (rewritable).	Cheap discs; portable and light; widely supported; suitable for music and small files	Small capacity (about 700 MB); slow; easily scratched; being replaced by other media
DVD drive	Uses a laser to read and write DVDs. Used for films, software and backups. Types: DVD-ROM, DVD-R, DVD-RW and DVD-RAM.	Larger capacity than CD (about 4.7 GB); cheap discs; portable; widely supported	Scratches and damage affect data; slower than flash; limited capacity for modern files; drives are being removed from computers
Blu-ray drive	Uses a blue laser to read and write Blu-ray discs. Used for high-definition films, games and large backups.	Very large capacity (25 GB or more per layer); high-quality video; discs hard to copy	Discs and drives cost more; slower than flash storage; scratches affect data; needs a compatible drive

Solid-state storage devices

Type	Characteristics and uses	Advantages	Disadvantages
Fixed solid-state drive (SSD)	Flash memory with no moving parts, built into the computer. Used in laptops, phones and tablets in place of an HDD.	Very fast; silent; no moving parts so durable; low power; light; quick start-up	More expensive per gigabyte; smaller capacity for the price; flash cells wear out after many writes
Portable SSD	An SSD in a case connected by USB. Used for fast backups and moving large files.	Faster than portable HDD; durable and light; no moving parts	More expensive per gigabyte than a portable HDD; flash cells wear out
Pen drive / flash drive	A small flash memory device that plugs into a USB port. Used to carry files between computers.	Very small and light; easy to carry; no moving parts; plug and play; rewritable	Easy to lose or steal; smaller capacity than a hard drive; more expensive per gigabyte; can carry malware

EXAM TIP

Do not call solid-state storage 'RAM'. SSDs and flash drives are **non-volatile**, so data stays when the power is off. When comparing, use the words capacity, speed, cost, portability and durability, and say which type is higher or lower.

Key terms

Term	Meaning
Storage device	Hardware that reads and writes data on a storage medium.
Storage medium	What the data is stored on, such as a disc or tape.
Magnetic storage	Stores data as magnetised areas on a surface.
Optical storage	Uses a laser to read and write pits and lands on a disc.
Solid-state storage	Flash memory with no moving parts.
HDD	Hard disk drive; spinning magnetic platters.
SSD	Solid-state drive; flash memory used as a drive.
Serial access	Data is found by reading through it in order, as on tape.
Non-volatile	Keeps data when power is off.