

3.2 Storage Media

Syllabus 2026 - 2028

WHAT YOU NEED TO KNOW

- Characteristics, uses, advantages and disadvantages of storage media: magnetic, optical and solid-state
- Magnetic: magnetic hard disks and magnetic tape
- Optical discs: CD, DVD and Blu-ray
- Solid-state media: memory cards (SD, xD, CFast)

Storage media are the items on which data is actually stored. A device reads and writes to the medium. The same three groups apply: magnetic, optical and solid-state.

Magnetic media

Type	Characteristics and uses	Advantages	Disadvantages
Magnetic hard disk	Rigid metal or glass platters coated with magnetic material, read by heads that never touch the surface. Used inside HDDs for operating systems and files.	Very large capacity; cheap per gigabyte; can read and write quickly; data can be changed	Platters and heads are damaged by knocks; can be wiped by strong magnets; slower than solid-state
Magnetic tape	A long plastic strip coated with magnetic material, wound on a reel or cartridge. Used for backups, archives and large data sets.	Very low cost per gigabyte; huge capacity; long life; easy to store off-site	Serial access makes finding data slow; can stretch or wear; affected by magnets, heat and damp

Optical discs

Type	Characteristics and uses	Advantages	Disadvantages
CD (-ROM, -R, -RW)	A plastic disc with a reflective layer; data is read by laser. About 700 MB. Used for music, software and small backups.	Cheap; light and portable; can be posted; CD-ROM data cannot be accidentally overwritten	Low capacity; scratches cause errors; slow; CD-R can only be written once
DVD (-ROM, -R, -RW, -RAM)	Same design as a CD with smaller pits, so more capacity (4.7 GB single layer, 8.5 GB dual layer). Used for films and software.	Larger capacity than CD; cheap; portable; widely playable	Scratches and dirt cause errors; limited capacity for modern needs; DVD-R can only be written once
Blu-ray	A disc read by a blue-violet laser with very small pits. Capacity 25 GB (single layer) or 50 GB (dual layer). Used for HD films, games and large backups.	Highest capacity of the three discs; high-quality video; strong protective coating	Costs more; needs a Blu-ray drive; slower than flash; still can be scratched

Solid-state media

Type	Characteristics and uses	Advantages	Disadvantages
Memory card (SD)	A small flash card with no moving parts. Used in cameras, phones, tablets and games consoles.	Small and light; no moving parts; fast; can be reused; widely supported	Easy to lose; smaller capacity per cost than hard disk; flash cells wear out; may need an adapter

Type	Characteristics and uses	Advantages	Disadvantages
xD card	An older small flash card used mainly in some digital cameras.	Compact; reusable; no moving parts	Obsolete; low capacity; more expensive than SD; few devices support it
CFast card	A fast flash card based on SATA, used in professional cameras and industrial equipment.	Very fast read and write speeds; large capacity; suited to video recording	Expensive; needs compatible devices; not widely used

Comparing the three types of media

	Magnetic	Optical	Solid-state
Capacity	Very large	Small to medium	Medium to large
Speed	Medium	Slow	Fast
Durability	Moving parts can be damaged	Scratches damage data	No moving parts, very durable
Cost per GB	Low	Low	Higher
Portability	Hard drives bulky; tape heavy	Light and portable	Very small and portable

EXAM TIP

For 'describe', 'compare' or 'which would you use' questions, link the media to the use. Tape suits backing up a whole network, Blu-ray suits distributing a film, and an SD card suits a camera because it is small and has no moving parts.

Key terms

Term	Meaning
Storage medium	The item on which data is stored.
Magnetic hard disk	Rigid platters coated with magnetic material.
Magnetic tape	A plastic strip coated with magnetic material.
CD	Optical disc of about 700 MB.
DVD	Optical disc of about 4.7 GB or more.
Blu-ray	High-capacity optical disc read by a blue-violet laser.
Memory card	Small solid-state storage used in cameras and phones.
SD / xD / CFast	Types of flash memory card.
-ROM / -R / -RW	Read only / write once / rewritable.