

1.2 MEMORY and 1.3 STORAGE

RANDOM ACCESS MEMORY (RAM)

- RAM is the computer's main memory that holds the data, programs and files while they are being used.
- RAM is volatile (power off = the data is lost)
- The CPU will fetch instructions from the RAM in the fetch - decode - execute cycle.
- When the RAM is full the computer uses **VIRTUAL MEMORY**. It uses the secondary storage as temporary RAM so that the computer can continue running (but slowly).

READ ONLY MEMORY (ROM)

- The ROM is on a chip build into the motherboard
- It contains the BIOS (boot up sequence for the computer)
- ROM is non-volatile (data still stored after power is off)

TYPES OF STORAGE

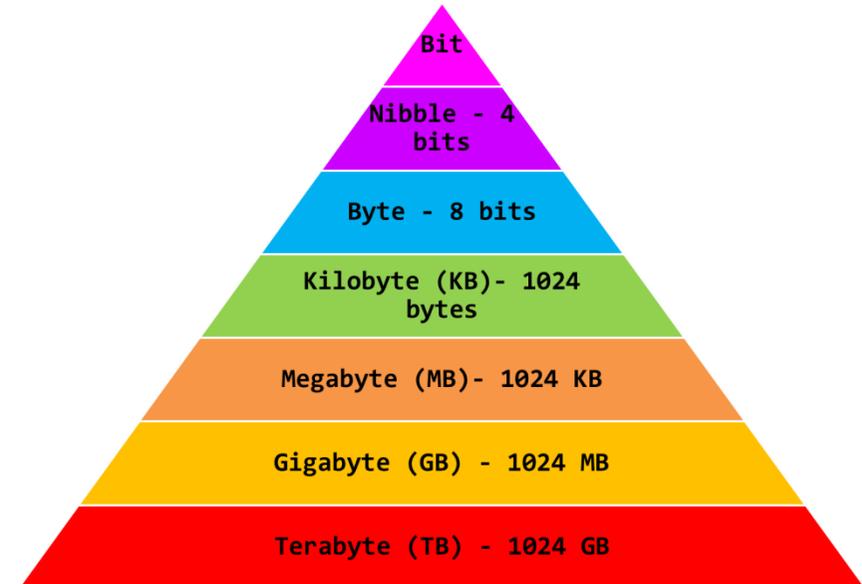
- Secondary Storage: where all data including the programs are stored when they are not being used.

Storage	Key Information
Hard Disk Drive (HDD)	Magnetic, has moving parts, large capacity, lower cost than SSD
Solid State Drive (SSD)	Flash memory, no moving parts, more robust than HDD, faster and more expensive than HDD
Flash memory	e.g. USB memory sticks, memory cards.
Optical Storage	e.g. CDs, DVDs. Cheap, portable and fairly robust.
Magnetic tape	Used for archive storage (backups). Very large capacity, low cost, slow.

Storage device comparison factors: speed, cost, durability, robustness, capacity and portability.

STORAGE CAPACITY

Some storage methods such as a HDD or SSD have a large capacity (they can store lots of data. Other devices such as CDs and SD cards have smaller capacity. Measurements of capacity are shown below:



1000 instead of 1024 could be used when doing your conversion calculations, because you will not be allowed a calculator in your exam.

EXAM QUESTIONS

1. Explain how the RAM works with the CPU in the fetch -decode - execute cycle
2. Explain the difference between volatile and non-volatile memory giving an example of each
3. Tom is buying a new laptop, he is not sure whether to get a magnetic HDD or SSD. Discuss the benefits and drawbacks of each.