IGCSE COMPUTER SCIENCE • EXERCISE SHEET

3.3 Data storage

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

Objective

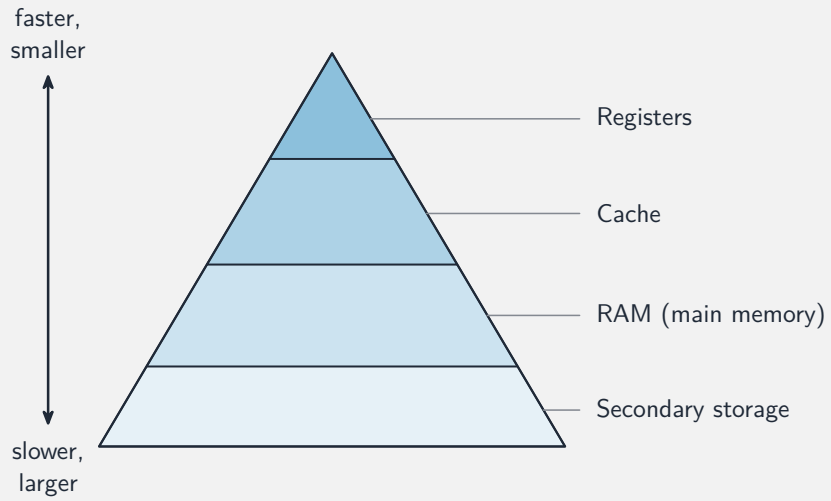
Build the skills to answer exam questions on **data storage** 数据存储—**RAM/ROM** 内存, **secondary storage** 辅助存储, and **virtual memory** 虚拟内存.

You must be able to:

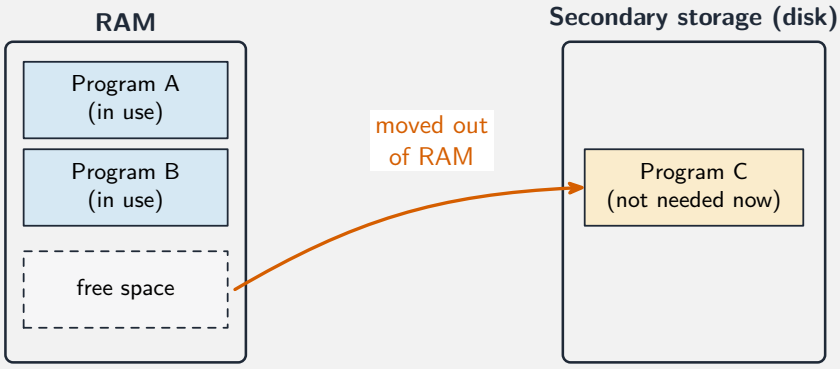
- compare RAM and ROM (volatile/non-volatile, read/write)
- describe magnetic, optical and solid-state secondary storage
- explain virtual memory

1 Worked examples

Memory and storage



Registers/cache: fast but small; secondary storage: slow but large



This frees RAM, so more programs can run than RAM alone could hold — but it is slower, because the disk is much slower than RAM.

When RAM is full, unused data is moved to disk to free RAM — slower, but runs more programs

- **RAM:** volatile, read/write. **ROM:** non-volatile, read-only (start-up).

2 Practice

2.1 State whether RAM is volatile or non-volatile. [1]

2.2 Name the three types of secondary storage. [3]

3 Exam-style questions

3.1 ROM is used to store: [1]

- **A** programs in use now
- **B** the start-up instructions
- **C** files permanently
- **D** virtual memory

3.2 A computer uses virtual memory.

(a) Explain what virtual memory is. [2]

(b) State one disadvantage of using virtual memory. [1]

3.3 State one difference between an SSD and an HDD. [1]

4 Go further

You are now ready for the real exam questions on this subtopic. Open the **3.3 Data storage** past-paper sheet in the Library, or try these in **Practice mode**:

- 0478/11 J25 —Q7 (storage)
- 0478/11 J24 —Q5 (RAM / ROM / storage)

Solutions

2.1 volatile.

2.2 magnetic; optical; solid state.

3.1 B. ROM stores the start-up (boot) instructions.

3.2 (a) part of secondary storage used as extra (pretend) RAM; unused data is moved there to free RAM, so more programs can run.
(b) it is slower (secondary storage is slower than RAM).

3.3 an SSD has no moving parts / is faster (an HDD uses spinning magnetic disks).