

3.1 Computer architecture

Name: _____ Class: _____ Date: _____

Total: 9 marks

Objective

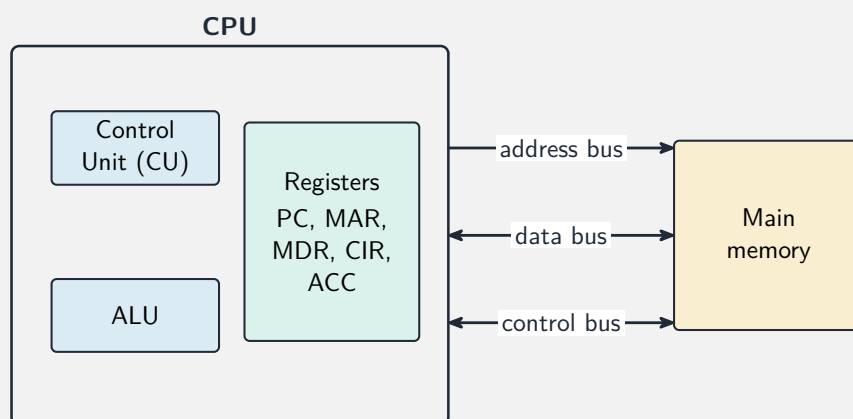
Build the skills to answer exam questions on **computer architecture** 计算机体系结构—the CPU parts, the **fetch–execute cycle** 取指执行周期, **cache** 高速缓存, and CPU performance.

You must be able to:

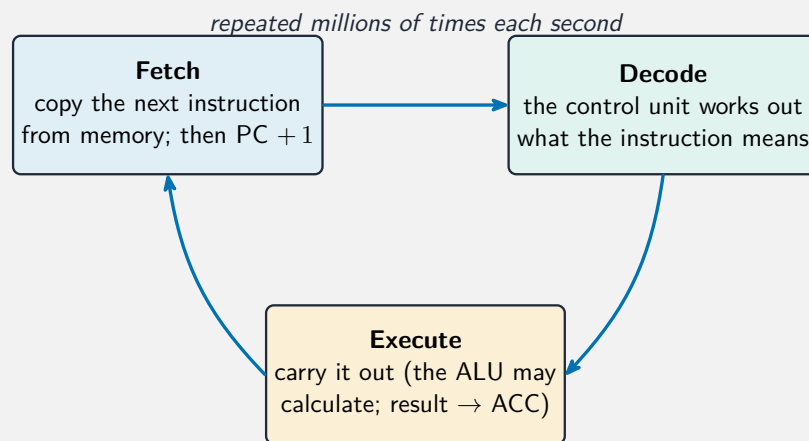
- name the CPU parts (ALU, CU, registers) and the buses
- describe the fetch–decode–execute cycle
- explain what affects CPU performance and what an embedded system is

1 Worked examples

■ The CPU and the cycle



The CPU holds the CU, ALU and registers; the address, data and control buses link it to memory



The CPU repeats: fetch the instruction, decode it, then execute it

- performance ↑ with more **cores**, a larger **cache**, and a higher **clock speed**.

2 Practice

2.1 State the function of the ALU. [1]

2.2 Name the three stages of the fetch–execute cycle. [3]

3 Exam-style questions

3.1 Cache memory speeds up the CPU because it: [1]

- **A** stores data permanently
- **B** is very fast memory holding frequently used data
- **C** has no power needs
- **D** is part of secondary storage

3.2 A computer is upgraded.

(a) State two changes that would improve CPU performance. [2]

(b) State what is meant by an embedded system, with one example. [2]

4 Go further

You are now ready for the real exam questions on this subtopic. Open the **3.1 Computer architecture** past-paper sheet in the Library, or try these in **Practice mode**:

- 0478/11 N25 —Q6 (CPU / architecture)
- 0478/12 N25 —Q4 (fetch-execute)

Solutions

2.1 it carries out calculations and logical operations.

2.2 fetch; decode; execute.

3.1 B. Cache is fast memory holding frequently used data.

3.2 (a) any two of: more cores; larger cache; higher clock speed.

(b) a small computer built into a device to do one fixed job; e.g. a washing machine or microwave.