

End of topic quiz

Topic 1.1 Systems architecture

1. What is the purpose of the CPU?

2. What is a register?

3. What is the name and purpose of one register in the CPU?

4. Which components are part of the CPU?

Component	Part of the CPU
Cache	
RAM	
ALU	
Control Unit	
ROM	

Use the following information to answer Questions 5-9

	CPU 1	CPU 2
Type	Quad Core	Dual Core
Clock Speed	2.3 GHz	3.1 GHz
Cache Size	512 KB	2 MB
Fitment	Socket 478	Socket 775

5. Which processor has the fastest clock speed?

6. What are the effects of using a processor with a faster clock speed?

7. How many cores does CPU 1 have?

8. What are the effects of using a processor with more cores?

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9. Which CPU has the bigger cache?

10. What are the effects of using a processor with a bigger cache?

11. What is an embedded system?

12. What are three examples of embedded systems?

13. What is the function of each of these CPU components?

- ALU

- Control Unit

- Cache

Answers

1. What is the purpose of the CPU?

To process data by fetching, decoding and executing instructions.

2. What is a register?

A small piece of memory that is volatile. It is directly accessed by the CPU and will store instructions, addresses or data.

3. What is the name and purpose of one register in the CPU?

Accept one of the following:

Memory Address Register, used to store the address of the next instruction / data to be accessed

Memory Data Register, used to store the data to be brought from / sent to main memory

Program Counter, used to store the address of the next instruction

Accumulator used to store the value currently being worked on / result of the last calculation.

4. Which components are part of the CPU?

Component	Part of the CPU
Cache	✓
RAM	
ALU	✓
Control Unit	✓
ROM	

Use the following information to answer Questions 5-9

	CPU 1	CPU 2
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5. Which processor has the fastest clock speed?

CPU 2

6. What are the effects of using a processor with a faster clock speed?

More instructions carried out per second and so instructions are executed more quickly.

7. How many cores does CPU 1 have?

4

8. What are the effects of using a processor with more cores?

More instructions carried out simultaneously; the processor can process more instructions at the same time, which allows batches of instructions to be executed more quickly; allows for more programs that are designed to be run on multiple cores to be run faster.

9. Which CPU has the bigger cache?

CPU 2

10. What are the effects of using a processor with a bigger cache?

More space for frequently used instructions/data, more storage for faster access than from RAM.

11. What is an embedded system?

A dedicated purpose or limited purpose.
Dedicated microprocessor for that/those tasks.
(Usually) has firmware.

12. What are three examples of embedded systems?

e.g.

- Dishwasher
- MP3 player
- Washing machine
- Mobile phone
- Manufacturing equipment
- Sat Nav
- Car collision detection

13. What is the function of each of these CPU components?

- ALU

- Arithmetic and logic unit, used to perform arithmetic calculations (e.g. +, -, *), used to perform logical operations (e.g. <, >, =, !=).

- Control Unit

- Transmits timing signals to manage and regulate actions such as reading and writing data, the input and output of data.

- Cache

- Stores frequently used instructions and data, built onto the CPU, provides faster access than RAM, allows instructions and data to be loaded into the CPU more quickly.

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