End of Unit Quiz – Unit 1.1 Systems Architecture

1. What is the purpose of the CPU?

2. What is the function of the CPU?

3. What is meant by a register?

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

5. Tick one box in each row to show whether each component is part of the CPU.

	Part of the CPU	**Not part of the CPU**
Cache		
RAM		
ALU		
Control Unit		

ROM		

Use the following information to answer questions 6 -10

	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

6. Which processor has the fastest clock speed?

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

8. How many cores are in CPU 1?

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

10. Which CPU has the bigger cache?

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

12. What is meant by an embedded system?

13. What is the purpose of embedded systems?

14. Provide three examples of embedded systems.

15. What are the purposes of the following components in the CPU?

- ALU

- Control Unit

- Cache

Answers

1. What is the purpose of the CPU?

To fetch, decode and execute instructions OR to process data.

2. What is the function of the CPU?

To fetch, decode and execute instructions.

3. What is meant by a register?

A component for holding short term memory, used to store addresses or data currently being worked on.

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

Memory Address Register, used to store the address of the next instruction / data to be accessed OR 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 OR Accumulator used to store the value currently being worked on / result of the last calculation.

5. Tick one box in each row to show whether each component is part of the CPU.

	Part of the CPU	**Not part of the CPU**
Cache	✓	

RAM		✓
ALU	✓	
Control Unit	✓	
ROM		✓

Use the following information to answer questions 6 -10

	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

6. Which processor has the fastest clock speed?

CPU 2.

7. 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, which allows for more programs to be run at the same time. This then allows for more complex processing (e.g. 3D graphics) to be completed in real time.

8. How many cores are in CPU 1?

4 cores.

9. 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, which allows for more programs to be run at the same time.

10. Which CPU has the bigger cache?

CPU 2.

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

More space for frequently used instructions / data, more storage for very fast access, meaning faster fetching of instructions – so faster processing, meaning faster fetching of data – so faster processing.

12. What is meant by an embedded system?

A computer system that is built into another device.

13. What is the purpose of embedded systems?

To provide specific, pre-defined function which is cheaper than providing a personal computer system. It doesn't include unnecessary features, can be made much smaller than a personal computer system, allows for a device to be automated / programmed.

14. Provide three examples of embedded systems.

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

15. What are the purposes of the following components in the CPU?

- ALU

Arithmetic & logic unit, used to perform arithmetic calculations (e.g. add, subtract, multiply), used to perform logical operations (e.g. <, >, =, !=).

- Control Unit

Control the flow of data within the CPU (i.e. between registers), control input and output of data to/from the CPU, controls the timing of signals sent within the CPU.

- 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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