

Question Zone 1-3

- State the names of the 3 main components that make up the CPU. [3]
  - Control Unit
  - Arithmetic Logic Unit
  - Immediate Access Store / Cache
- Define the words 'decode' and 'execute', in relation to the function of the CPU. [2]
  - Decode is the process carried out by the CPU where it makes sense of an instruction
  - Execute is the act of the CPU carrying out the instruction on some data.
- Describe what happens during the F-D-E cycle. [3]
  - Fetch: The address bus will request an instruction/data from an address in RAM/cache and the data bus will deliver the instruction / data back to the CPU
  - Decode: The instruction is 'made sense of' by the Control Unit
  - Execute: The arithmetic logic unit will carry out the instruction.

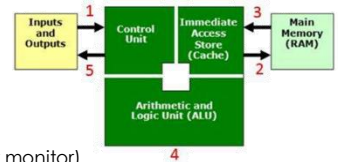
Question Zone 4-6

- Describe the roles of both the address and data bus. [2]
  - The address bus requests instructions/data from RAM/cache by sending the memory addresses of the required instructions/data
  - The data bus delivers the requested instruction/data back to the CPU

- Explain the job of the CPU's control unit. [6]
  - The control unit's job is to control the running of the CPU by performing 3 main jobs
  - It manages and monitors hardware on the computer...
  - ...to ensure the correct data goes to the correct hardware.
  - It manages the input and output signals...
  - ...ensuring that incoming instructions are dealt with correctly and so that output signals are sent to the correct places.
  - Maintains and sends out clock signals...
  - ...to synchronise the running of the Fetch-Decode-Execute cycle.

Question Zone 7-9

- Explain, using a diagram, the journey of an instruction from input device to output device. [5]



- An input device (e.g. keyboard) sends data to the CPU. The Control Unit receives this data.
- The Control Unit sends this data into main memory to be used later.
- When the time is right, the data will be transferred from main memory into cache (IAS)
- The data will then be sent to the ALU for processing
- The control unit will send the processed data back (for example to an output device such as a screen or monitor)

- Discuss differences between the roles of both the RAM and the cache in how data is delivered to the CPU, during the fetch-decode-execute cycle. [4]

- Both the RAM and cache are classed as primary memory as they directly supply the CPU with data/instructions.
- The RAM has a much larger capacity (GBs) than cache (MBs) and holds the programs that are being used at that time.
- The cache will store frequently used instructions / instructions needed immediately by the CPU
- Despite having fast read/write speeds, the RAM is much slower than the cache at delivering data/instructions to the CPU.
- The cache can deliver instructions at the rate that the CPU requires it.