Question Zone 1-3

1. State the names of the 3 main components that make up the CPU. [3]
   - Control Unit
   - Arithmetic Logic Unit
   - Immediate Access Store / Cache

2. 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.

Question Zone 4-6

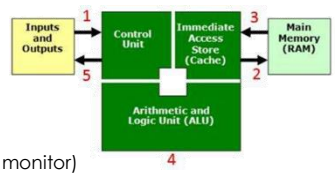
3. Describe what happens during the F-D-E cycle. [3]
   - Fetch: The address bus will request an instruction/data from an address in RAM/cache and the data bus will deliver the instruction / data back to the CPU
   - Decode: The instruction is 'made sense of' by the Control Unit
   - Execute: The arithmetic logic unit will carry out the instruction.

4. 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

5. 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

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



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

7. 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 bring 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.