



4.7.3.6 Interrupts

1) Interrupts can be generated by devices connected to the processor during the Fetch-Execute cycle.

a) Describe what an interrupt is.

[1 mark]

- A signal/request sent to the processor (from a hardware device or program)

b) Describe the role of interrupts.

[2 marks]

- Allows the currently executing process to be suspended
- So that a piece of software or hardware that needs processor attention can be serviced // so that an urgent error condition can be serviced

c) Explain why the volatile environment (the contents of registers) must be saved before an interrupt is serviced.

[2 marks]

- So that the currently running process can be returned to
- As the current register values will be overwritten by the routine that handles the interrupt

2) Describe what happens in the CPU when it receives an interrupt.

[5 marks]

- If the interrupt is of a lower or equal priority to the current process then the current process continues
- If the interrupt is of a higher priority the CPU finishes its current FDE cycle
- The contents of the CPU's registers are copied/pushed to a stack in memory
- The location of the interrupt service routine is loaded into the program counter
- When the ISR is complete, the previous contents are popped from the stack and loaded back into the register

