2008 Paper 8 Question 5

Comparative Architectures

(*a*) Why is it important to concentrate on improving the common case (e.g. the most commonly used operations and resources) when designing a microprocessor? [4 marks]

(*b*) What is the major difference between a very long instruction word (VLIW) processor and a dynamically-scheduled superscalar processor? What impact does this have on the complexity of the implementation in each case?

[4 marks]

(*c*) When designing a VLIW processor, why might variable-length instruction bundles be preferred over fixed-length instructions? [4 marks]

(*d*) Some VLIW processors contain additional hardware to permit memory reference speculation.

    (*i*) What optimisation does memory reference speculation permit?

[4 marks]

    (*ii*) Briefly describe the additional hardware required to support this type of speculation. [4 marks]