

3 Comparative Architectures (rdm34)

- (a) Some VLIW processors exploit fine-grain multithreading and SIMD execution units.
- (i) What benefits could adding support for fine-grain multithreading to a VLIW processor provide? [4 marks]
 - (ii) Why might a simple round-robin thread schedule be inefficient and how could we improve the schedule? [2 marks]
 - (iii) Assuming the VLIW processor has taken full advantage of fine-grain multithreading with a simple round-robin thread schedule, what changes to the processor might an optimised thread schedule require to ensure programs continue to execute correctly? [4 marks]
 - (iv) Why might it be useful to include SIMD functional units when a VLIW processor can already specify independent operations to be executed in parallel? [4 marks]
- (b) Some VLIW processors support variable-length bundles of independent instructions.
- (i) Why is this a useful feature and how could it be supported? [2 marks]
 - (ii) What costs would be incurred and additional logic needed to support this feature? [4 marks]