Computer Fundamentals

(a) What is the key idea behind the von Neumann architecture? To what extent do modern computers conform to this architecture? [2 marks]

(b) Explain why modern computers contain both Dynamic RAM (DRAM) and Static RAM (SRAM). [4 marks]

(c) How do modern computers represent signed integer values? Why? [2 marks]

(d) In the context of assembly language programming:

(i) What is an addressing mode? [2 marks]

(ii) What are pseudo instructions? Why are they used? [2 marks]

(iii) What is the stack? What is it used for? [2 marks]

(iv) What is an indirect jump? Why would one be used? [2 marks]

(e) Computer A has 32 32-bit registers, while Computer B has 16 64-bit registers. Give two advantages that Computer A possesses over Computer B. [4 marks]