2011 Paper 1 Question 7

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 programing:

   (*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]