

2009 Paper 8 Question 13

System-on-Chip Design

- (a) How and why does SystemC model registers that have widths not native to the C language? [5 marks]
- (b) Sketch C++ code in the style of SystemC for a five-bit synchronous counter module that counts up or down depending on an input signal. Explain whether you consider your design to be fully within the nominal “synthesisable subset” of SystemC. [7 marks]
- (c) Does SystemC reduce the need for RTLs (Register Transfer Languages) such as Verilog and VHDL? Explain what SystemC can provide that is not found in RTLs and *vice versa*. [8 marks]