

2005 Paper 9 Question 13

Specification and Verification II

- (a) Discuss the challenge of modelling transistors in a way that is both tractable for formal verification and accurate enough to be useful. [5 marks]
- (b) Discuss the accuracy of the simple switch model of transistors and discuss how the model can be improved. [5 marks]
- (c) Outline how transistor circuits that use precharging can be formally modelled in higher order logic. Briefly discuss potential inaccuracies of such models. [5 marks]
- (d) Describe how to specify that a bit-level circuit with 4-bit inputs a and b and an 8-bit output $prod$ performs multiplication. [5 marks]