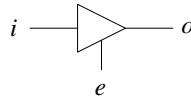


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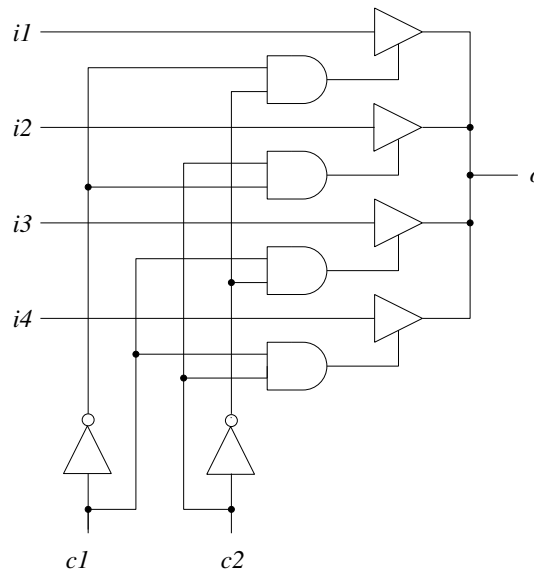
Specification and Verification II

A tri-state buffer connects its input i to its output o when the enable line e is driven with Hi. When e is Lo the output o is in a high impedance state Z .



Write down and explain a logical predicate modelling such a buffer. [4 marks]

The circuit shown below is a four-way multiplexer designed with tri-state logic. Assume that the control inputs $c1$, $c2$ and the data inputs $i1$, $i2$, $i3$, $i4$ are either Hi or Lo.



Write down a specification of the multiplexer. [4 marks]

Write down predicates modelling an inverter and an AND-gate. [2 marks]

Explain how the multiple driving of the output o by the four buffers can be modelled. [4 marks]

Explain how to compose together the predicates modelling the components of the multiplexer into a predicate representing the complete circuit and write down the result. [6 marks]