

2011 Paper 7 Question 10

Temporal Logic and Model Checking

Write down temporal logic formulae that capture the meanings of the properties described in English below (\mathbf{p} and \mathbf{q} are atomic properties, i.e. properties of states). In each case say which logic you are using and briefly justify your choice.

- (a) “on every path there is a point after which \mathbf{p} is always true” [5 marks]
- (b) “from every state it is possible to get to a state where \mathbf{p} is true” [5 marks]
- (c) “if \mathbf{p} is true for 100 successive states then eventually \mathbf{q} will be true” [5 marks]
- (d) “if \mathbf{p} is true infinitely often along a path then so is \mathbf{q} ” [5 marks]