6 Temporal Logic and Model Checking (MJCG)

In this question assume that \( p \) and \( q \) are atomic formulae.

(a) Compare and contrast path formulae and state formulae in temporal logic. [4 marks]

(b) Describe and contrast the meanings of \( F(G\ p) \) and \( AF(AG\ p) \). [4 marks]

(c) Describe and contrast the meanings of \( G(F\ p) \) and \( AG(AF\ p) \). [4 marks]

(d) Write down and justify a temporal logic formula that expresses the property that some state satisfying \( q \) is reachable from every state satisfying \( p \). [4 marks]

(e) Write down and justify a temporal logic formula that expresses the property that no path contains a consecutive sequence of 256 states satisfying \( p \). [4 marks]