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]