(a) Describe how Floyd–Hoare logic can be used to reason about programs that use arrays. [4 marks]

(b) Write a partial correctness specification of the form \( \{ P \} \ C_{\text{max}} \ {Q} \) that specifies that the effect of executing \( C_{\text{max}} \) is to set the variable \( M \) to the maximum of the values \( A(0), \ldots, A(N) \) (where \( 0 \leq N \)) in the state before executing the command (i.e. \( C_{\text{max}} \) computes the maximum value stored in the array \( A \) between positions 0 and \( N \)). [4 marks]

(c) Devise a particular command \( C_{\text{max}} \) that meets your specification. [4 marks]

(d) Give an outline proof that your command meets your specification. [8 marks]