

## 2008 Paper 7 Question 15

### Specification and Verification I

- (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  $\{P\} C_{max} \{Q\}$  that specifies that the effect of executing  $C_{max}$  is to set the variable  $M$  to the maximum of the values  $A(0), \dots, A(N)$  (where  $0 \leq N$ ) in the state before executing the command (i.e.  $C_{max}$  computes the maximum value stored in the array  $A$  between positions  $0$  and  $N$ ). [4 marks]
- (c) Devise a particular command  $C_{max}$  that meets your specification. [4 marks]
- (d) Give an outline proof that your command meets your specification. [8 marks]