

2001 Paper 2 Question 1

Multi-part question

Answer all five parts.

- (a) “The ML type system ensures that every program does what it is supposed to do.” Write *three* sentences, each either supporting or refuting this statement. [4 marks]
- (b) A lot of large software projects fail. Many companies described Y2K bug fixing as a substantial project. Why then did the expected chaos not materialise in January 2000? [4 marks]
- (c) Describe the software engineering principles of loop design. Illustrate your answer using the example of a loop that reverses the order of the first N elements of the array A . [4 marks]
- (d) Draw a picture of a deterministic finite automaton with set of input symbols $\{a, b\}$ whose language of accepted strings consists of all strings containing an odd number of occurrences of the symbol a . [4 marks]
- (e) Bluetooth is a radio technology where tiny nodes replace lengths of wire or cable between items of equipment with little or no modification to the design of the equipment. Sketch a block diagram of a typical node and write *three* sentences describing three of the main blocks. [4 marks]