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]