2000 Paper 8 Question 13

Specification and Verification II

Describe the syntax and semantics of Computation Tree Logic (CTL).   [4 marks]

Write down CTL formulae expressing the following properties:

(*a*)   *if* req *goes high then it will stay high until* ack *goes high and then go low on the next cycle*   [2 marks]

(*b*)   *if ever* req *is high and* started *is low then eventually* error *will become permanently high*   [2 marks]

Briefly describe the main ideas underlying model checking. What is symbolic model checking?   [4 + 4 marks]

Compare and contrast the use of a model checker and a theorem prover for formal verification.   [4 marks]