CMPUT 329 - Computer Organization and Architecture II
Quiz # 3 — Fall 2003

Prof. José Nelson Amaral
Computing Science Department
University of Alberta

StudentID:	Name:

CMPUT 329 Honor Code

By turning in the quiz solution for grading, I certify that I have worked all the solutions on my own, that I have not copied or transcribed solutions from a classmate, someone outside the class, or from any other source. I also certify that I have not facilitated or allowed any of my classmates to copy my own solutions. I am aware that the violation of this honor code constitutes a breach of the trust granted me by the teaching staff, compromises my reputation, and subjects me to the penalties prescribed in Section 26.1 of the University of Alberta 2003/2004 Calendar.

Edmonton, September, 2003.

This is a **true** or **false** test. For each statement you have to indicate whether the statement is true or false. Use the capital letter T to indicate true, and the capital letter F to indicate false. You win 10 points for each correct answer. **You lose 5 points for each incorrect answer.** You are neither rewarded nor penalized for questions that you do not answer. If you answer all questions correctly you will make a maximum of 100 points. Regardless of how many questions you answer wrong, your score in the quiz cannot be below zero.

1. (   ) In a sequential circuit the current value of the outputs can always be determined if we know the current value of all the inputs.
2. (   ) In order to make sure that you do not damage CMOS devices, it is always a good idea to walk across a thick carpet immediately before touching the device terminals with your bare hands.
3. (   ) The propagation delay of a signal path is the amount of time that it takes for a change in the input signal to produce a change in the output signal.
4. (**T**) Most of the energy consumed on the operation of an electronic device built with CMOS technology is due to the dissipation of power when the CMOS transistors make transitions from the *on* to the *off* state or vice-versa.
5. (   ) Multiple three-state output components can be connected together to create a multi-source bus as long as the control logic is designed in such a way that no two outputs are enabled at the same time.

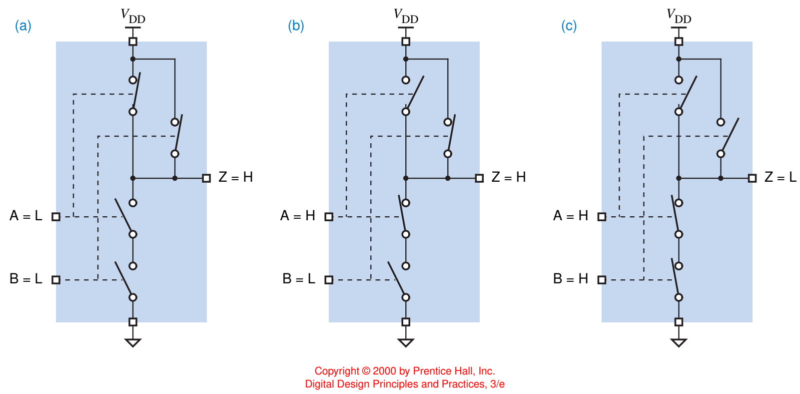

Figure 1: Switch Model for a CMOS Circuit

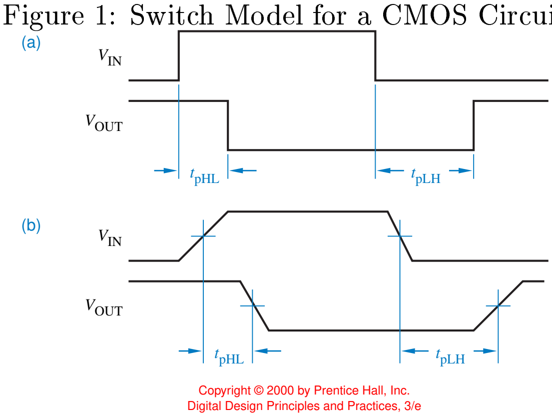

Figure 2: Propagation delays for a CMOS inverter

6. (   ) A logic family is a collection of different integrated-circuit chips that have similar input, output, and internal circuit characteristics, but that perform different logic functions.

7. (   ) If positive logic is used, Figure 1 shows the switch model for a 2-input NAND gate.

8. (   ) The great majority of all new large-scale integrated circuits, such as microprocessors and memories are transistor-transistor logic (TTL) and are built with bipolar junction transistors.

9. (   ) Part of the energy consumed by laptops and cell phones when in stand-by mode is due to the finite resistance of the CMOS transistors when they are in the *off* state.

10. (   ) In the time diagrams of Figure 2, t_{pLH} is the time between an input change and the corresponding output change when the input is changing from LOW to HIGH.