**Project #1**

**Due to Prof. Walker by 5:30pm on Wednesday 8 February 2006**
*this project counts as 10% of your course grade*

1. Do **Lab Exercise 4 on page 25** of *Rapid Prototyping of Digital Systems, Second Edition* ("Design a logic circuit to turn on the LED when both pushbuttons are pressed. Compile, simulate, and download the new circuit.") Use the FLEX 10K chip, the FLEX pushbuttons, and the decimal point between the two digits of the FLEX 7-segment display. Turn in:

   a) a readable (not microscopic) printout of the schematic (5 points)

   b) a printout of the test inputs and simulation output that shows that that the circuit works as expected, annotated to explain the operation of the circuit (25 points)

   c) a printout of the timing analysis showing the input to output delay matrix (5 points)

   d) a signature on the statement below by Prof. Walker, by the TA (Kevin Schaffer), by one of Prof. Walker's research students listed on the door of the lab, or by *two* other students in the class (15 points):

   I certify that _____ has successfully downloaded this design to a UP1 board and the design works correctly.

   _____ Name   _____ Date

   _____ Name   _____ Date

2. The XOR gate is sometimes called the "odd function" since it can be used to determine whether or not there are an odd number of 1's on its input. Use the FLEX chip, XOR gates, and whatever inputs and outputs you want to test this "odd function" for up to 4 inputs. Turn in:

   a) printouts (a) through (c) similar to those in problem 1 above (35 points)

   b) a signature on the statement below as specified above (15 points):

   I certify that _____ has successfully downloaded this design to a UP1 board and the design works correctly.

   _____ Name   _____ Date

   _____ Name   _____ Date