Name _____ Box _____ Due date: Friday March 23

ECE130 Homework #8 (Combinational circuit design) Spring 2001

1 (Modified Problem 35 on page 44 of Dr. Eccles' book). Find logic expressions for both a minimum **sum-of-products** logic circuit and a minimum **product-of-sums** logic circuit to produce Z=1 if the binary number AB≥CD.

Sum-of-products =

Product-of-sums =

Build your **sum-of-products** circuit with NAND-NAND construction on LogicWorks 4 using one 7404 Inverter chip, two 7400 NAND chips, and one 7430 NAND chip. Set all gate delay to be zero and simulate the circuit to find all possible output combinations. Tie the unused inputs of the 7430 to logic "1" with one binary switch. (You need to unlock the chips to access individual gates in order to change delay time.)

Attach the circuit schematic with all delays visible and one segment of the waveforms showing all input combinations. Mark the truth table on the waveforms.

ABCD	Z
0000	
0001	
0010	
0011	
0100	
0101	
0110	
0111	
1000	
1001	
1010	
1011	
1100	
1101	
1110	
1111	

CD \ AB	00	01	11	10
00	0	4	12	8
01	1	5	13	9
11	3	7	15	11
10	2	6	14	10

CD \ AB	00	01	11	10
00	0	4	12	8
01	1	5	13	9
11	3	7	15	11
10	2	6	14	10