

Name \_\_\_\_\_

CM \_\_\_\_\_

Due date: Tuesday, Sept. 30

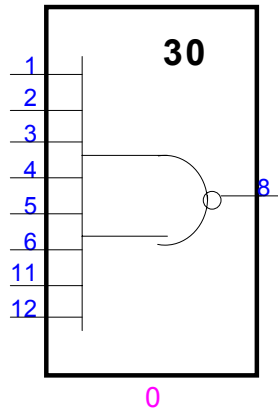
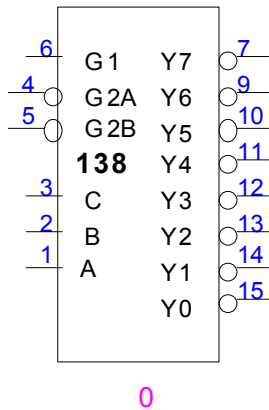
ECE130-01

Homework #9

Fall 2003

(Decoders)

- 1 (Decoder) Implement  $F(A,B,C)=\Pi(0,3,4,7)$  with the following 1-of-8 decoder and an 8-input NAND gate. Connect all the enable pins and unused pins on the NAND gate properly.



- 2 (Decoder) Implement a two-bit subtractor with borrow using 74LS138 decoder chips and either 74LS20 or 74LS30 chips as needed. The subtractor has two 2-bit inputs A1A0 and B1B0. It has three bit output, D1, D0 and Borrow.  $D1D0 = A1A0 - B1B0$  and Borrow when A1A0 is less than B1B0.

Implement your design with LogicWorks 4. Submit both your circuit schematic and waveforms with zero gate delay and show all input combinations. Mark the truth table on your waveforms.

(Make sure to tie unused inputs to "1" or "0" with binary switches. You need to click on the switches to activate them. Make the four input clock periods integer multiplex of each other to generate the truth table.)

	A1A0B1B0	D1	D0	Borrow
0	0000			
1	0001			
2	0010			
3	0011			
4	0100			
5	0101			
6	0110			
7	0111			
8	1000			
9	1001			
10	1010			
11	1011			
12	1100			
13	1101			
14	1110			
15	1111			