

ECE 1315 DIGITAL LOGIC DESIGN

ECE Dept, UMD
Feb 7, Tuesday, 2006

EXPERIMENT # 3: Logic minimization in terms of the number of gates

Implement the following function

$$f(w, x, y, z) = (w' + x' + z)(x'+y')(w' +x'y'z')$$

using only five or less number of gates. The gates you are allowed to use are AND (74LS08), OR (73LS32), NAND (74LS00), and NOR (74LS02) which are all two input gates, and NOT (74LS04) gates. An inverter is counted as a single gate. In this experiment, we do not care about the number of chips but the number of gates. Please algebraically manipulate the given function to derive a minimized equation and the circuit diagram that uses a minimum number of gates. Use LogiScan to verify your circuit and record the truth table. When your circuit works properly, have your instructor or TA sign the Results sheet.

Please design and prepare your circuit diagram before the actual lab session. Your circuit diagram should include pin numbers.

EXPERIMENT #3 RESULTS

Your Name: _____

Witnessed by : _____

Date _____

Number of gates used: _____

Show your minimization process by algebraically manipulated equations:

Circuit Diagram:

Truth Table Observed From LogiScan:

w	x	y	z	f
0				
0				
0				
0				
0				
0				
0				
0				
1				
1				
1				
1				
1				
1				
1				
1				