

## EET-210L Lab #4: Logic Design Using Multiplexers and Data Selectors.

Name \_\_\_\_\_

This experiment demonstrates the processes involved in implementing logic functions using multiplexers and data selectors. You will need a 74151 8x1 Mux (or use three inputs of the 74150), a 74150 16x1 data selector and a 7404 inverter.

- 1.) Use the 74151 to implement each of the X and Y outputs.

C	B	A	X	X	Y	Y
0	0	0	0		0	
0	0	1	0		1	
0	1	0	1		1	
0	1	1	1		0	
1	0	0	1		1	
1	0	1	0		0	
1	1	0	0		0	
1	1	1	1		1	

- 2.) Implement the function Z using just the 74150 16x1 Mux, and then use the 74151 8x1 Multiplexer and a 7404 inverter. You might wish to keep both circuits constructed simultaneously to directly compare their outputs.

D	C	B	A	Z	74150	74151
0	0	0	0	0		
0	0	0	1	0		
0	0	1	0	1		
0	0	1	1	1		
0	1	0	0	1		
0	1	0	1	1		
0	1	1	0	0		
0	1	1	1	0		
1	0	0	0	1		
1	0	0	1	1		
1	0	1	0	0		
1	0	1	1	1		
1	1	0	0	0		
1	1	0	1	1		
1	1	1	0	1		
1	1	1	1	0		

Instructor Initials \_\_\_\_\_

- 3.) Use the 74150 16x1 data selector and a 7404 to implement the following 5 variable logic function M.

E	D	C	B	A	M	74150
0	0	0	0	0	0	
0	0	0	0	1	0	
0	0	0	1	0	1	
0	0	0	1	1	1	
0	0	1	0	0	0	
0	0	1	0	1	1	
0	0	1	1	0	1	
0	0	1	1	1	0	
0	1	0	0	0	0	
0	1	0	0	1	0	
0	1	0	1	0	0	
0	1	0	1	1	1	
0	1	1	0	0	1	
0	1	1	0	1	1	
0	1	1	1	0	0	
0	1	1	1	1	1	
1	0	0	0	0	0	
1	0	0	0	1	1	
1	0	0	1	0	1	
1	0	0	1	1	0	
1	0	1	0	0	0	
1	0	1	0	1	0	
1	0	1	1	0	0	
1	0	1	1	1	0	
1	1	0	0	0	0	
1	1	0	0	1	1	
1	1	0	1	0	1	
1	1	0	1	1	1	
1	1	1	0	0	0	
1	1	1	0	1	0	
1	1	1	1	0	0	
1	1	1	1	1	0	
1	1	1	1	1	1	

Instructor Initials \_\_\_\_\_

At this point, you should feel confident in your ability to implement any 3, 4 or 5 variable truth table using a single 74150/74151 and a 7404 inverter. If not, practice. You may be asked to do so. :) When you have completed this experiment, make a post on the [cset.stcc.edu/forums](http://cset.stcc.edu/forums).