Jalen Powell
Elec 2200

Hw 12

1. minterms: $\Sigma(2,4,5,7)$

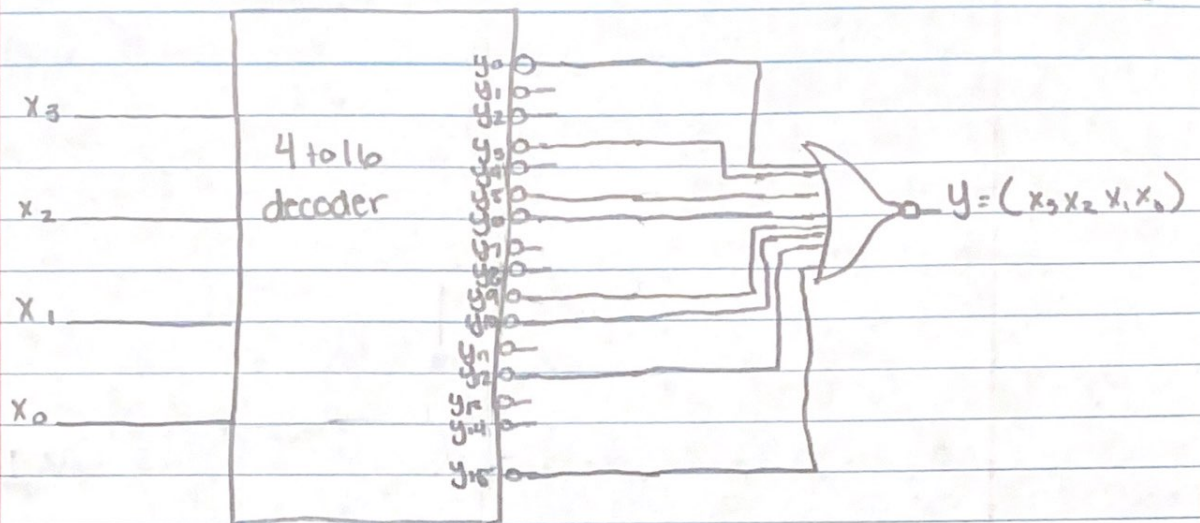|	X_2	X_1	X_0	
0	0	0	0	
1	0	0	1	
2	0	1	0	$\to \bar{X_2} X_1 \bar{X_0}$
3	0	1	1	
4	1	0	0	$\to X_2 \bar{X_1} \bar{X_0}$
5	1	0	1	$\to X_2 \bar{X_1} X_0$
6	1	1	0	
7	1	1	1	$\to X_2 X_1 X_0$

$y = \bar{X_2} X_1 \bar{X_0} + X_2 \bar{X_1} \bar{X_0}$
$+ X_2 \bar{X_1} X_0 + X_2 X_1 X_0$

$\downarrow$ convert to M

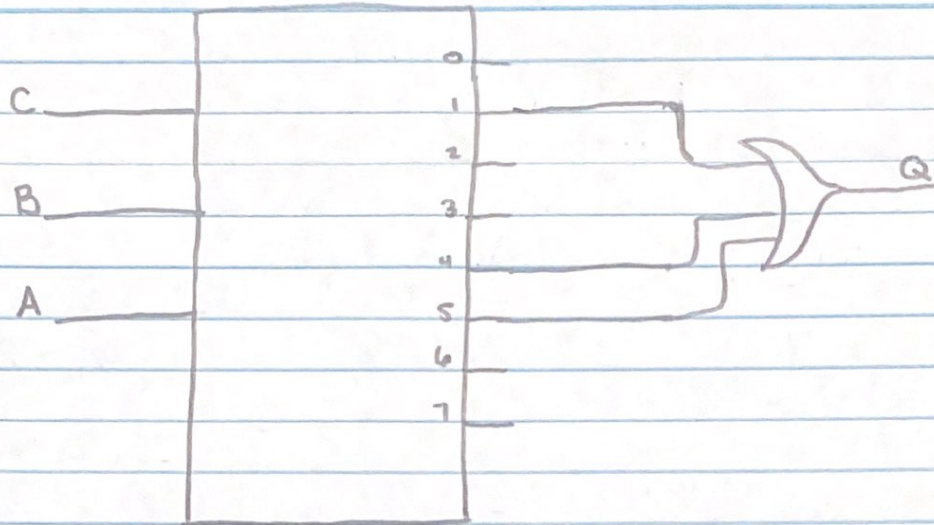$M = (X_2 + \bar{X_1} + X_0)(\bar{X_2} + X_1 + X_0)$
$(\bar{X_2} + X_1 + \bar{X_0})(\bar{X_2} + \bar{X_1} + \bar{X_0})$

2.

$y = \overline{(x_3 x_2 x_1 x_0)}$

4 to 16 decoder
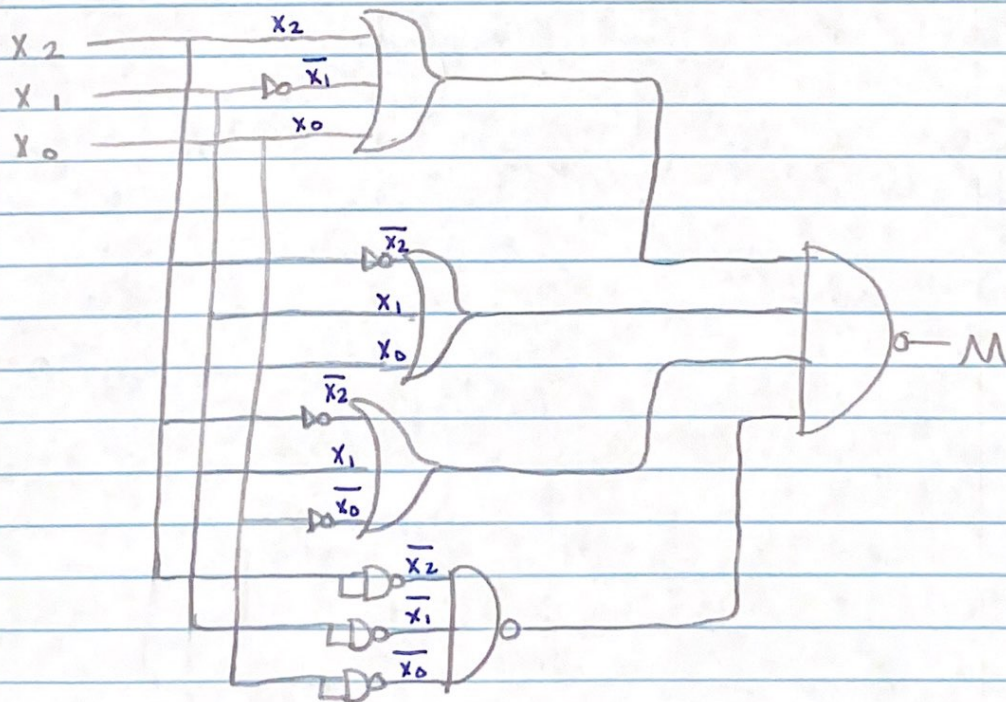
	x_3	x_2	x_1	x_0	Q	#'s 1s
0	0	0	0	0	0	0
1	0	0	0	1	1	1 (odd)
2	0	0	1	0	1	1 (odd)
3	0	0	1	1	0	2
4	0	1	0	0	1	1 (odd)
5	0	1	0	1	0	2
6	0	1	1	0	0	2
7	0	1	1	1	1	3 (odd)
8	1	0	0	0	1	1 (odd)
9	1	0	0	1	0	2
10	1	0	1	0	0	2
11	1	0	1	1	1	3 (odd)
12	1	1	0	0	0	2
13	1	1	0	1	1	3 (odd)
14	1	1	1	0	1	3 (odd)
15	1	1	1	1	0	4

$\Sigma_m = (1, 2, 4, 7, 8, 11, 13, 14)$

$\Pi M = (0, 3, 5, 6, 9, 10, 12, 15)$

3.

$$Q = \bar{A}\bar{B}C + \bar{A}B\bar{C} + A\bar{B}\bar{C}$$

	a	b	c	
0	0	0	0	
1	0	0	1	→ 001 = ABC
2	0	1	0	
3	0	1	1	
4	1	0	0	→ 100 = ABC
5	1	0	1	101
6	1	1	0	
7	1	1	1	