CPSC 2610
Lab Assignment 5
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1.

a.

Inputs				Outputs			
E	A	B	C	X	Y	Z	S
0	0	0	0	0	0	1	0
0	0	0	1	0	1	1	0
0	0	1	0	1	1	0	0
0	0	1	1	0	1	0	0
0	1	0	0	1	0	1	0
0	1	0	1	1	1	1	0
0	1	1	0	1	0	0	0
0	1	1	1	x	x	x	1
1	0	0	0	0	0	0	0
1	0	0	1	0	0	1	0
1	0	1	0	0	1	0	0
1	0	1	1	0	1	1	0
1	1	0	0	1	0	0	0
1	1	0	1	1	0	1	0
1	1	1	0	1	1	0	0
1	1	1	1	1	1	1	1

b.

X = Σm(2, 4, 5, 6, 12, 13, 14, 15)
= E'A'BC' + E'AB'C' + E'AB'C + E'ABC' + EAB'C' + EAB'C + EABC' + EABC

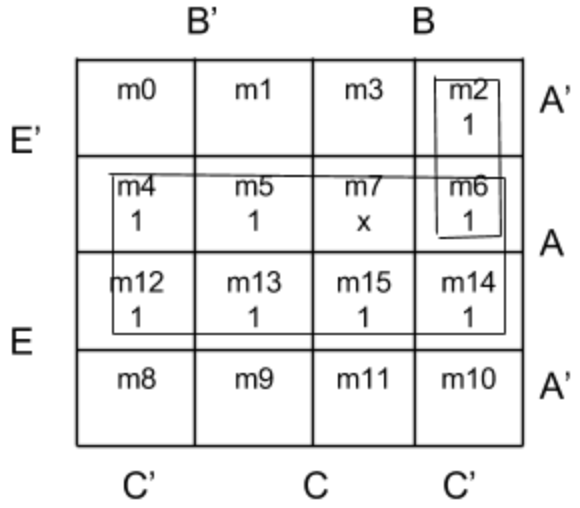
Y =Σm(1, 2, 3, 5, ,10, 11, 14, 15)
= E'A'B'C + E'A'BC' + E'A'BC + E'AB'C + EA'BC' + EA'BC + EABC' + EABC

Z = Σm(0, 1, 4, 5, 9, 11, 13, 15)
= E'A'B'C' + E'A'B'C + E'AB'C' + E'AB'C + EA'B'C + EA'BC + EAB'C + EABC

S = Σm(7, 15)
= E'ABC + EABC

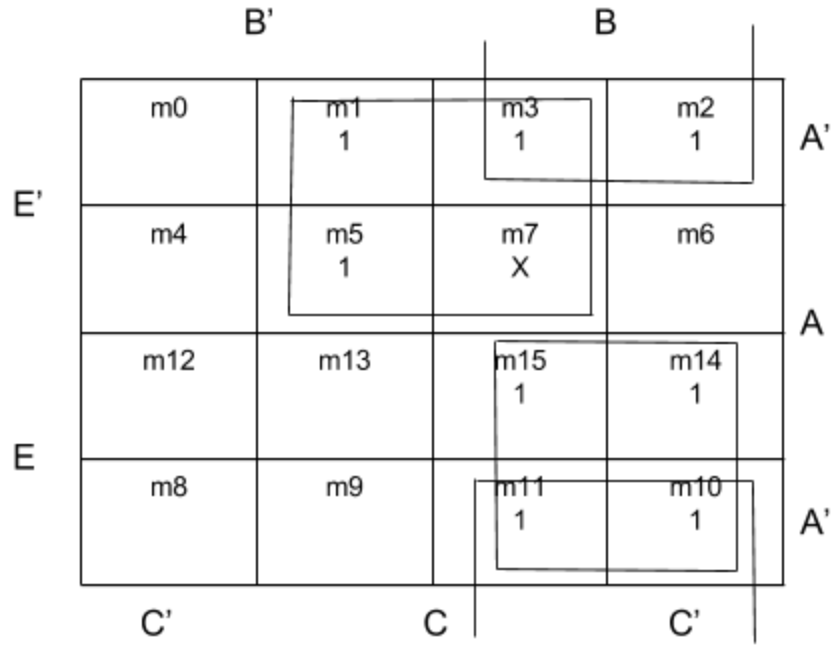
c.

X = Σm(2, 4, 5, 6, 12, 13, 14, 15)



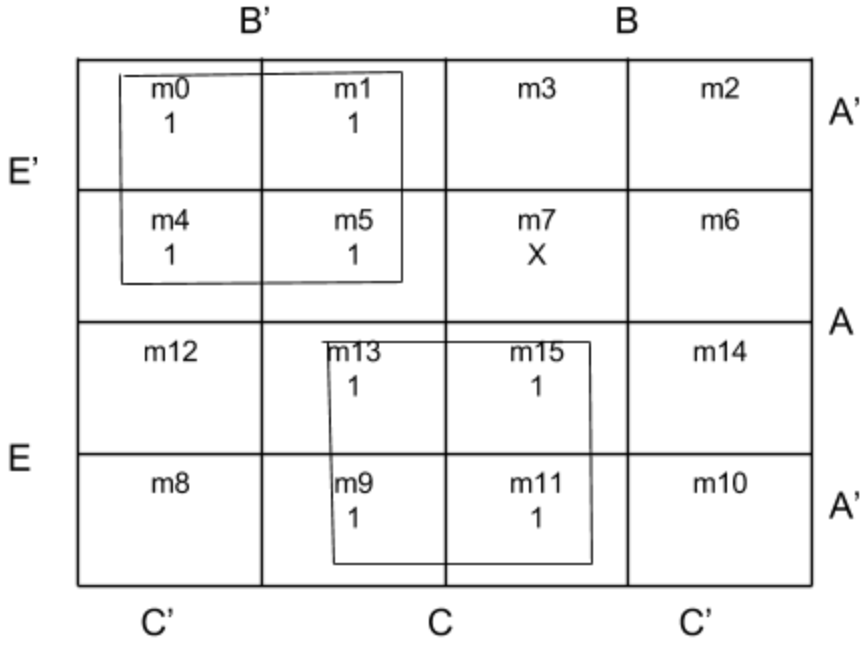
X = A + E'BC'

Y = Σm(1, 2, 3, 5, ,10, 11, 14, 15)



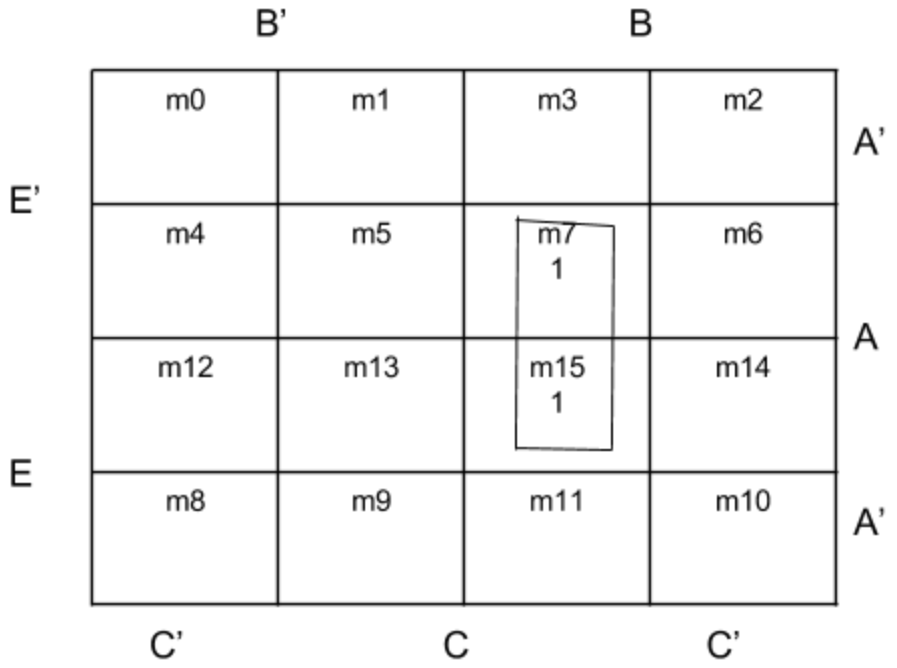
Y = E'C + EB + A'B

Z = Σm(0, 1, 4, 5, 9, 11, 13, 15)



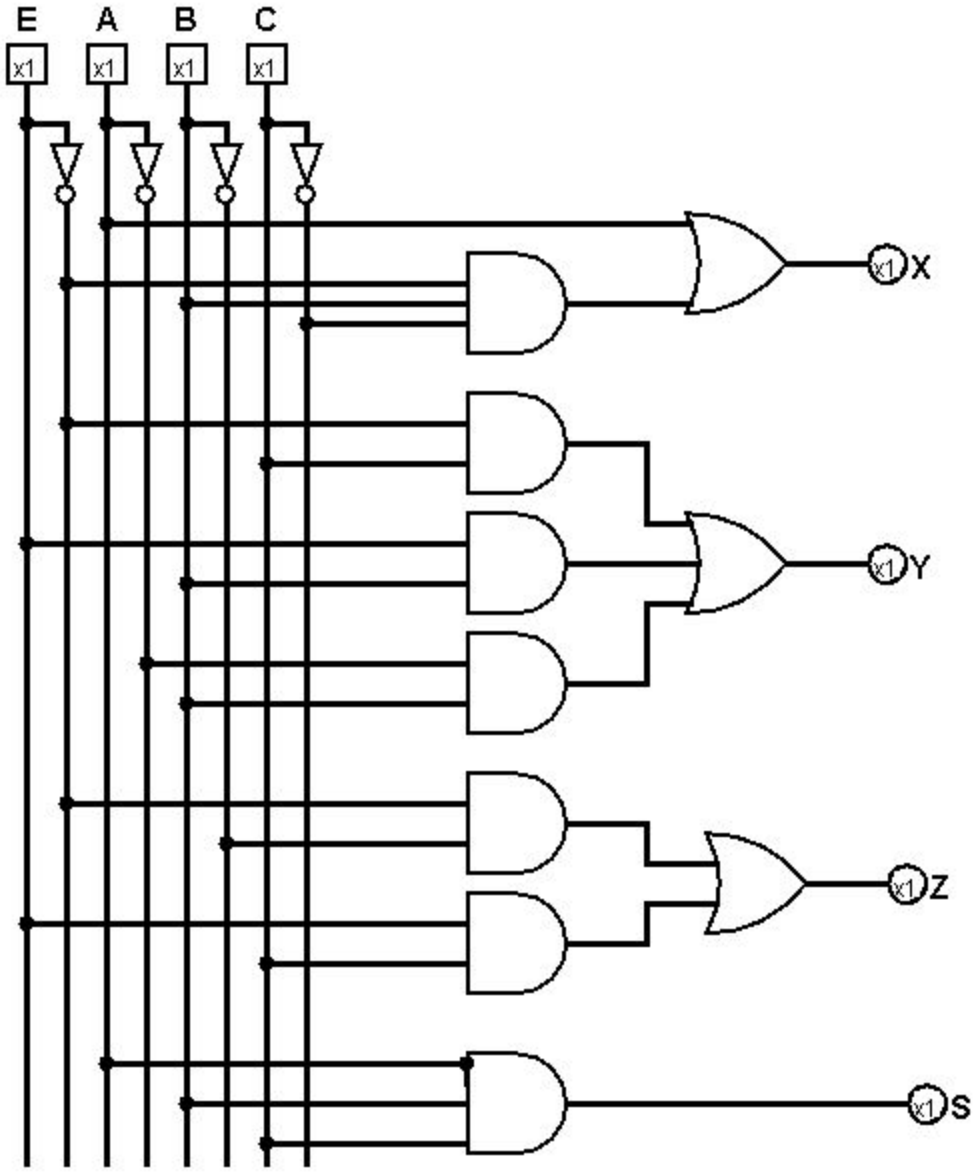
Z = E'B' + EC

S = Σm(7, 15)

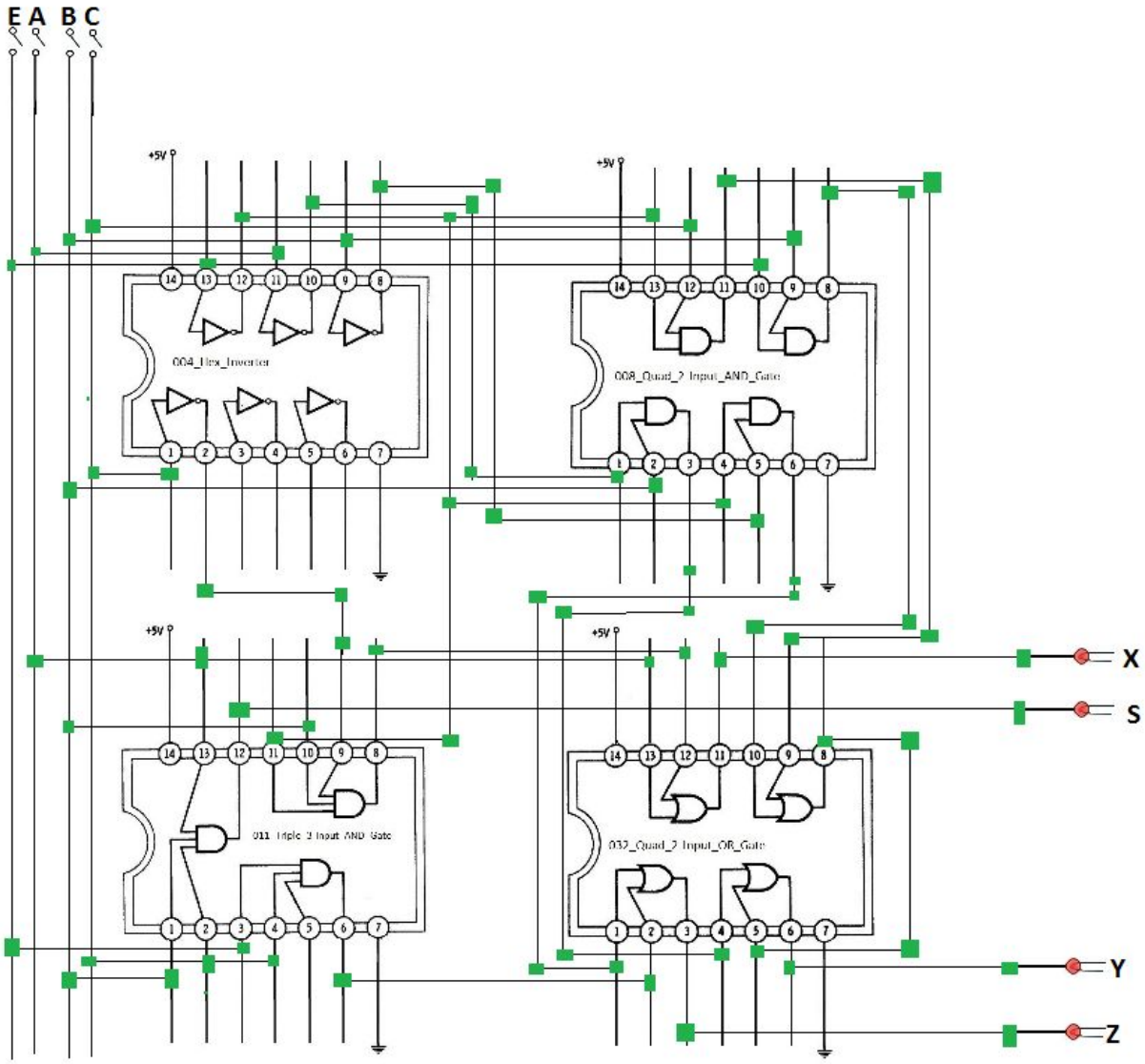


S = ABC

d.

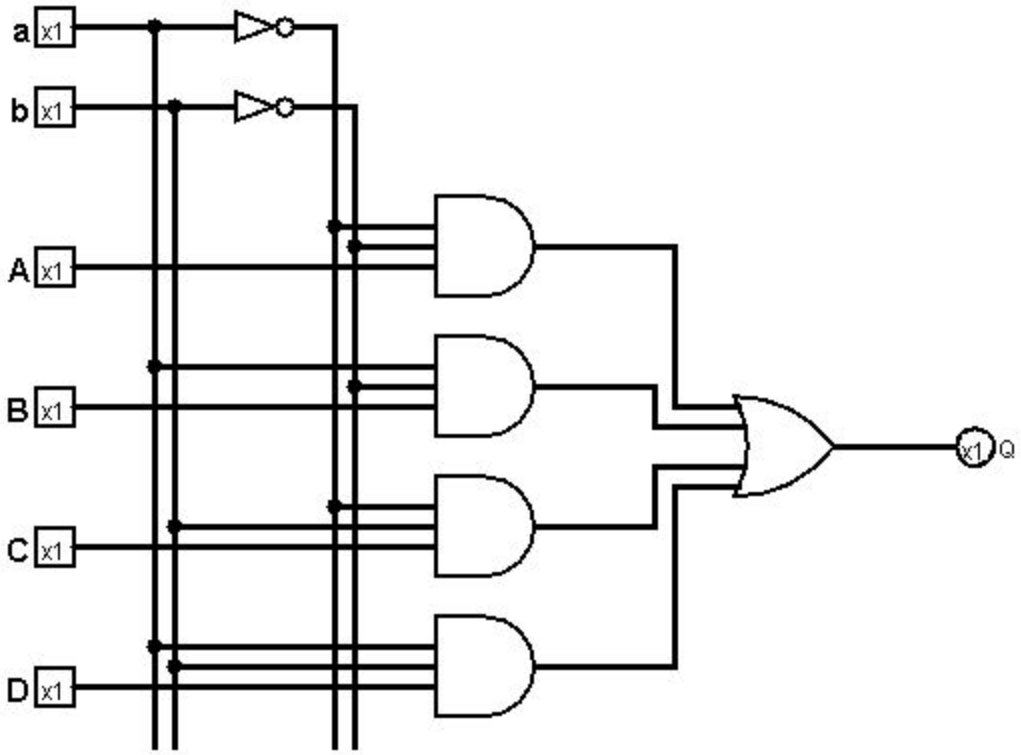


e.

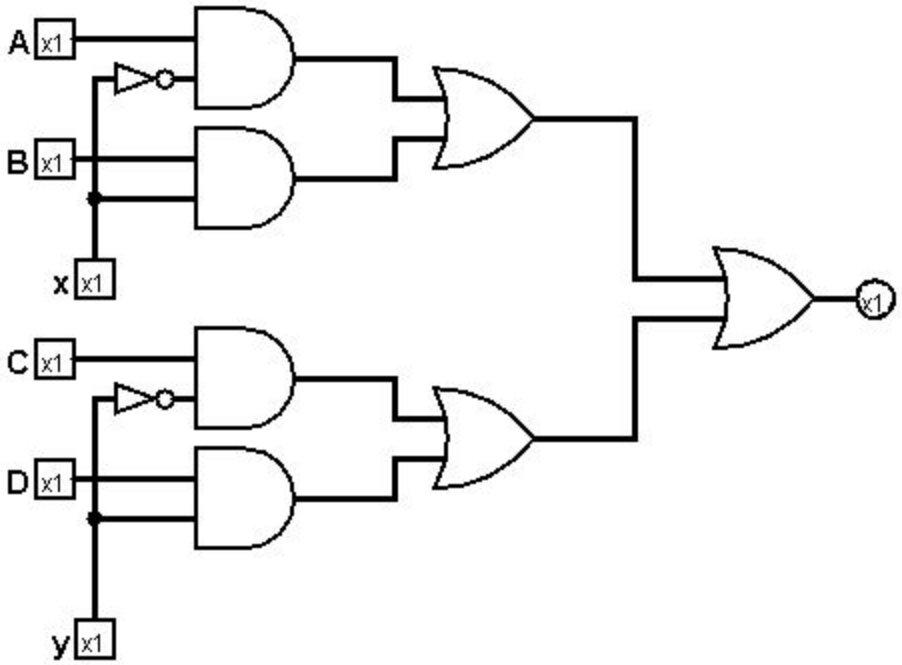


2.

a. The 4-to-1 multiplexer is like a switch. The A, B, C, D are the 4 output lines and a, b, are the switch to change to each output line.



b.



3.

a.

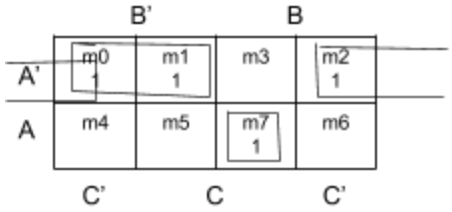
A	B	C	X	F
0	0	0	1	1
0	0	1	1	0
0	1	0	1	0
0	1	1	0	0
1	0	0	0	1
1	0	1	0	0
1	1	0	0	0
1	1	1	1	0

b. X = A'B'C' + A'B'C + A'BC'' + ABC

= Σm(0, 1, 2, 7)

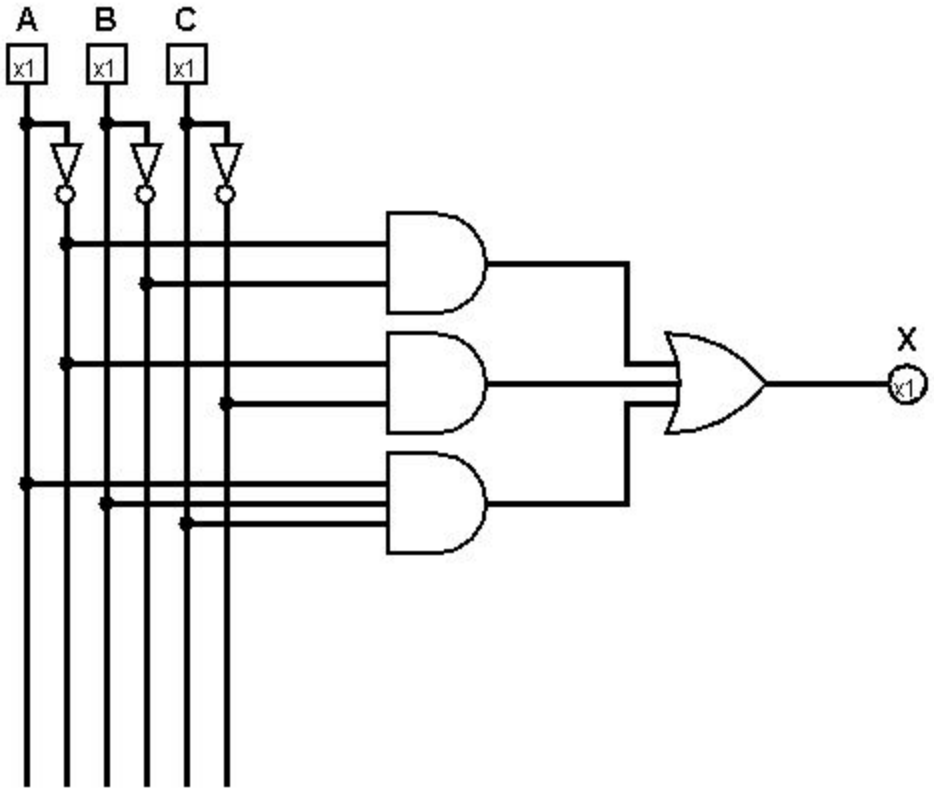
c.

X = Σm(0, 1, 2, 7)

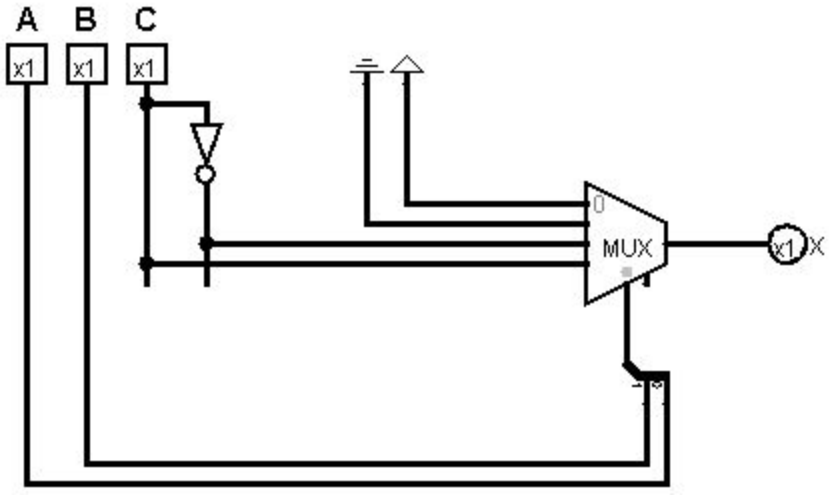


X = A'B' + A'C' + ABC

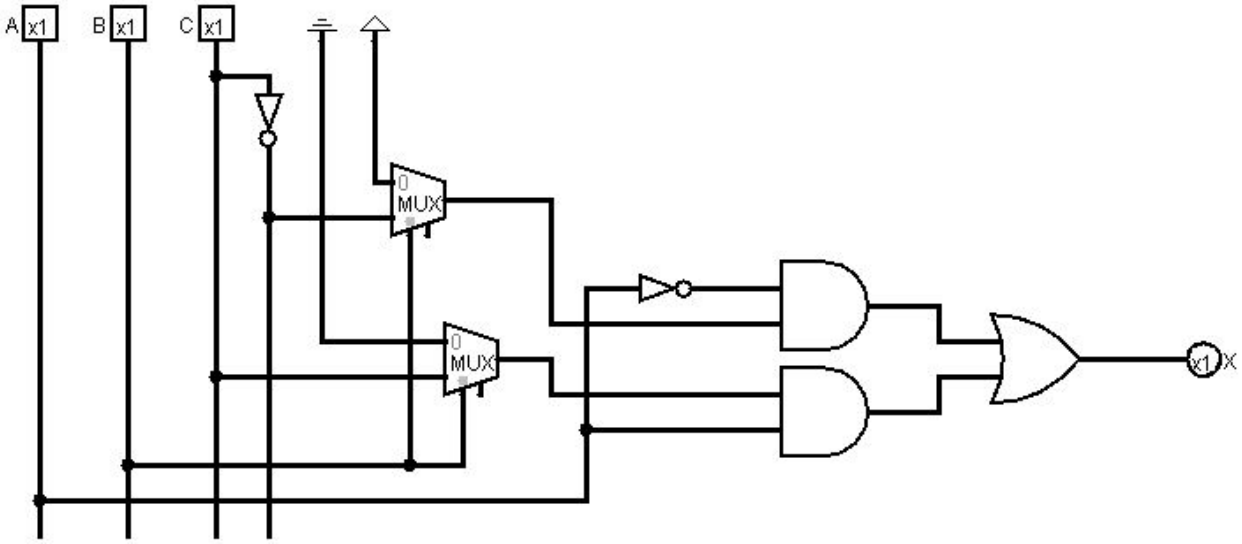
d.

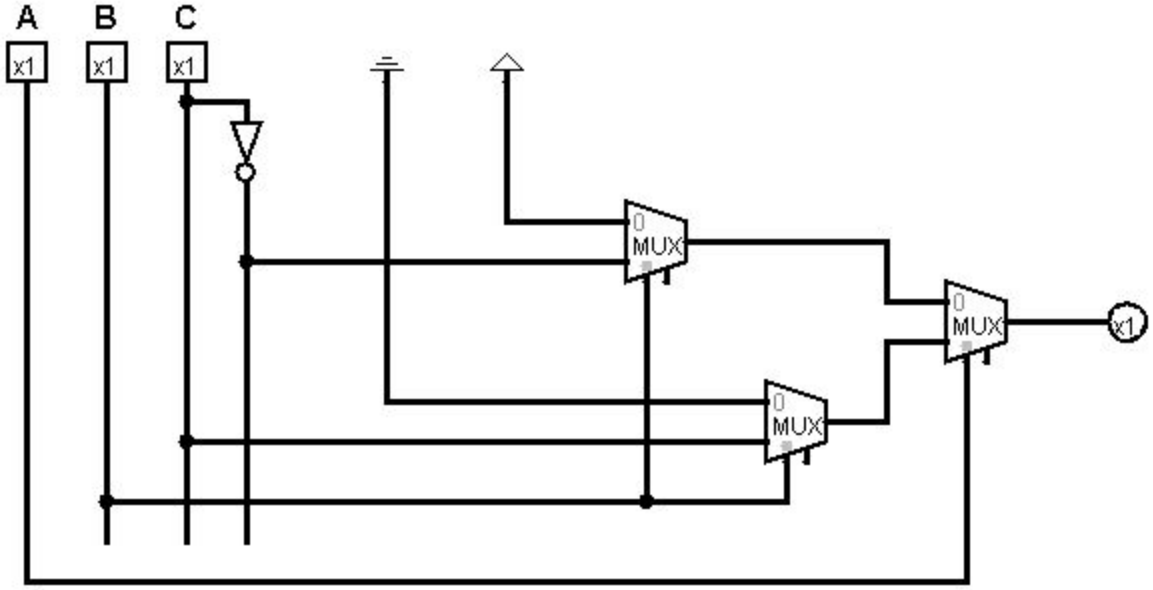


e.

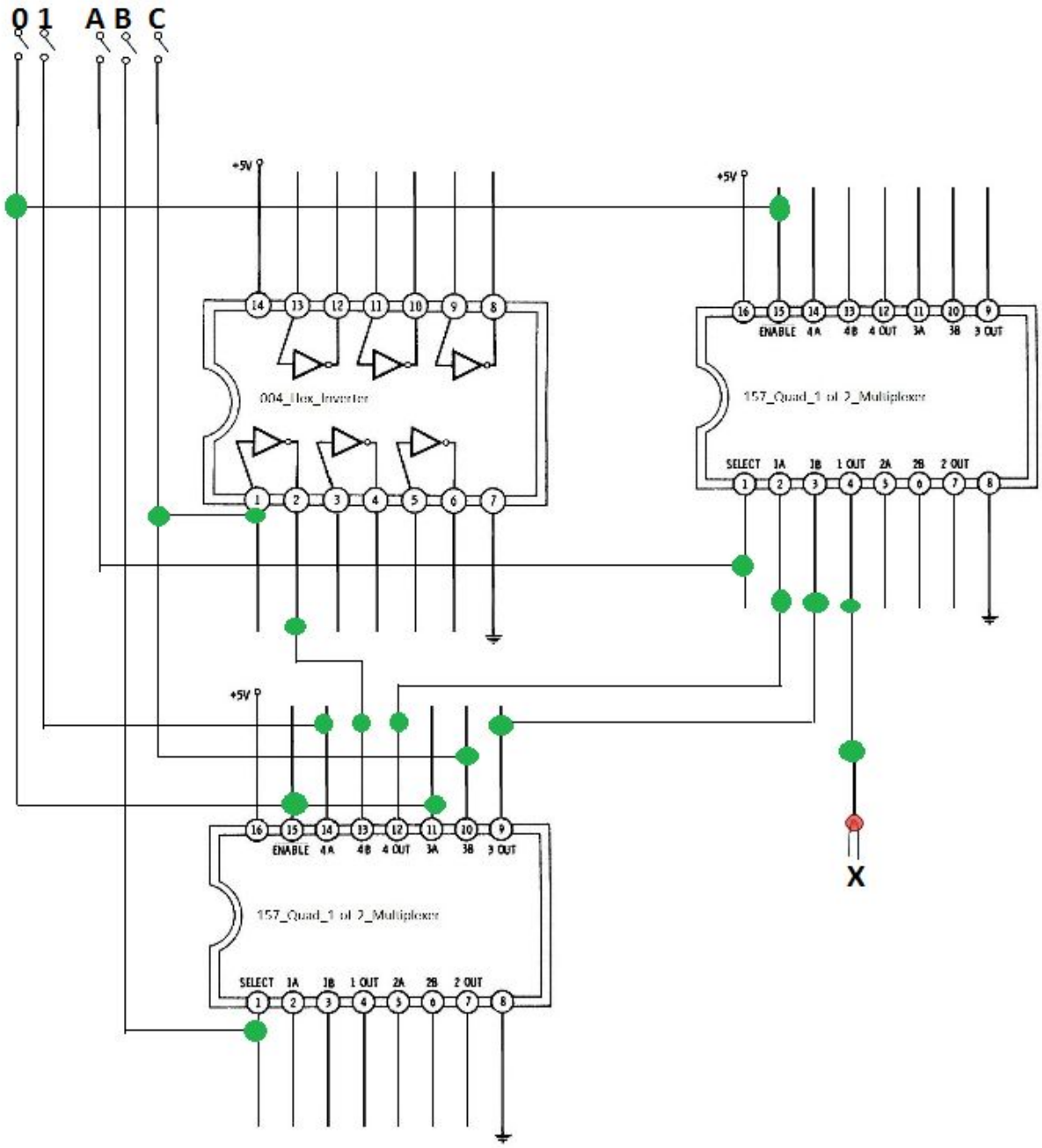


f.





h.


0 1 A B C
+5V
+5V
004_Hex_Inverter
157_Quad_1 of 2_Multiplexer
ENABLE 4A 4B 4 OUT 3A 3B 3 OUT
SELECT 1A 1B 1 OUT 2A 2B 2 OUT
+5V
157_Quad_1 of 2_Multiplexer
ENABLE 4A 4B 4 OUT 3A 3B 3 OUT
SELECT 1A 1B 1 OUT 2A 2B 2 OUT
X