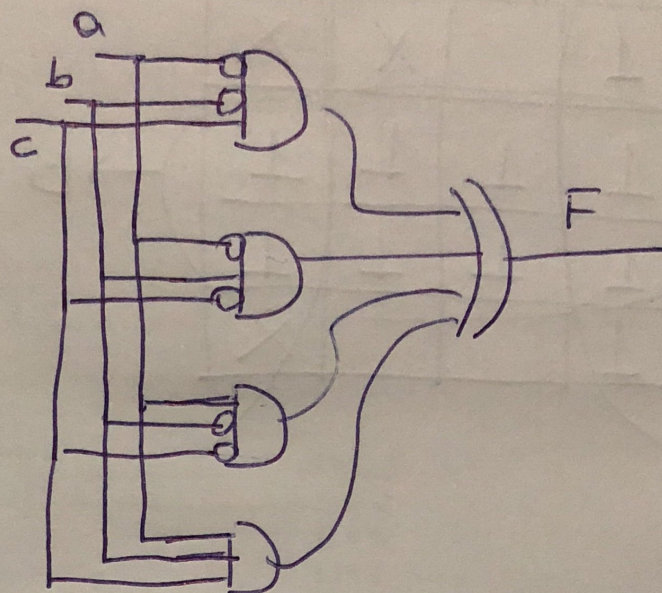


Q1)

a	b	c	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

$$F = a'b'c + a'b'c' + ab'c' + abc$$



Q2)

a) $F = ab'$

$G = (a' + ab)'$ - Use distributive law

$$= ((a' + a) * (a' + b))' = (1 * (a' + b))' = (a' + b)' = a.b'$$

b)

a	b	F	G
0	0	0	0
0	1	0	0
1	0	1	1
1	1	0	0

Q3) $wx(x'y + zy' + xy)$

$$= wx \underbrace{x'}_0 y + wx zy' + wx \underbrace{x}_x y$$

$$= wx zy' + wx y = wx(zy' + y)$$

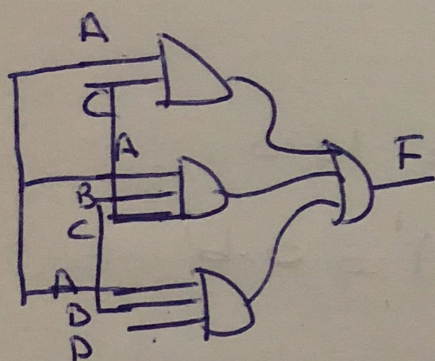
Q5)

$AB \backslash CD$	00	01	11	10
00	1		X	X
01	1	1	1	1
11	1	1	1	1
10	1			X

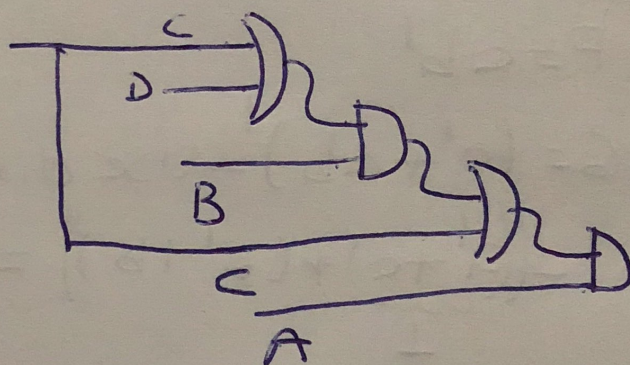
$$F = B + D'$$

Q6)

$$F = AC + ABC + ABD \quad F' = A(C + B(C + D))$$



$11 * 2 = 22$ transistors



$8 * 2 = 16$ transistors.

Q4) $F(a, b, c) = (a + c)(a' + cb)(b + c)$

$$= (\underbrace{a \cdot a'}_0 + \underbrace{a \cdot cb}_a + a'c + abc)(b + c)$$

$$= abb + abc + a'bc + a'cc + \cancel{abbc} + \cancel{abcc}$$

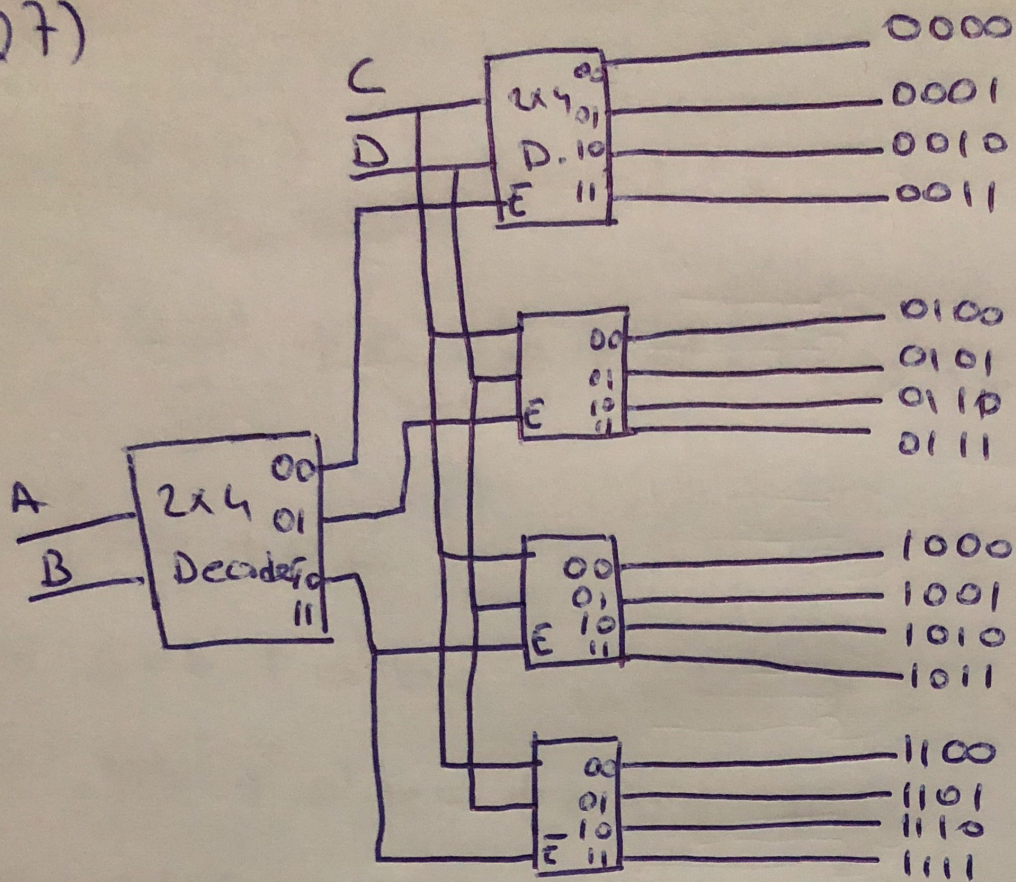
$$= ab + abc + a'bc + a'c$$

$$= \underline{ab}(c + c') + abc + a'bc + a'c(b + b')$$

$$= \underbrace{abc}_7 + \underbrace{abc'}_6 + \underbrace{a'bc}_3 + \underbrace{a'b'c}_4$$

$$F = \sum m(1, 3, 6, 7)$$

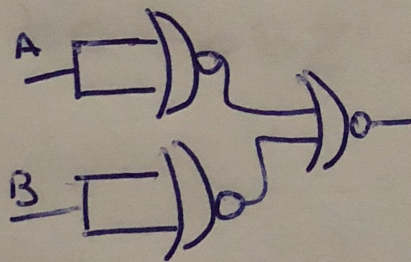
Q7)



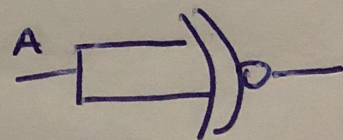
Q8)

A	B	NOR
0	0	1
0	1	0
1	0	0
1	1	0

AND GATE



NOT GATE



OR GATE

