

Nile logic

model ANS. 2016/2017

Q1

A. 1111 1111 $\begin{cases} \rightarrow \text{(i) } 255 \\ \rightarrow \text{(ii) } -1 \end{cases}$

B. 7

C. 6 bit

Q2

A. $Y = 1$

B. $F = C + A\bar{D}$

AB \ CD	00	01	11	10
00			1	1
01			1	1
11	1		x	x
10	1		x	x

C. $F = (xy + z)(y + xz)$

$$= xy + xyz + yz + xz$$

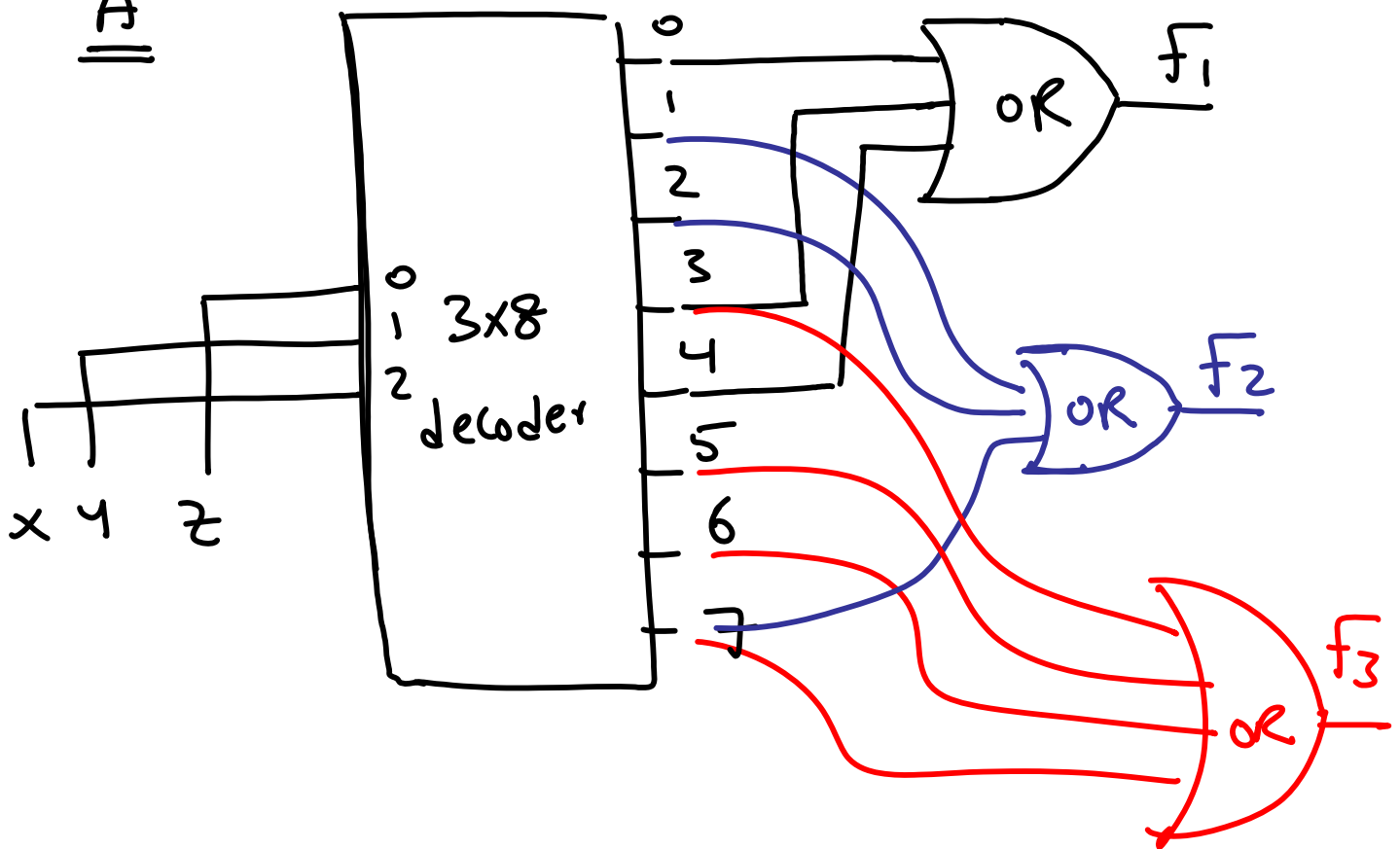
x	y	z	f
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

$$f = \sum (3, 5, 6, 7)$$

$$f = \prod (0, 1, 2, 4)$$

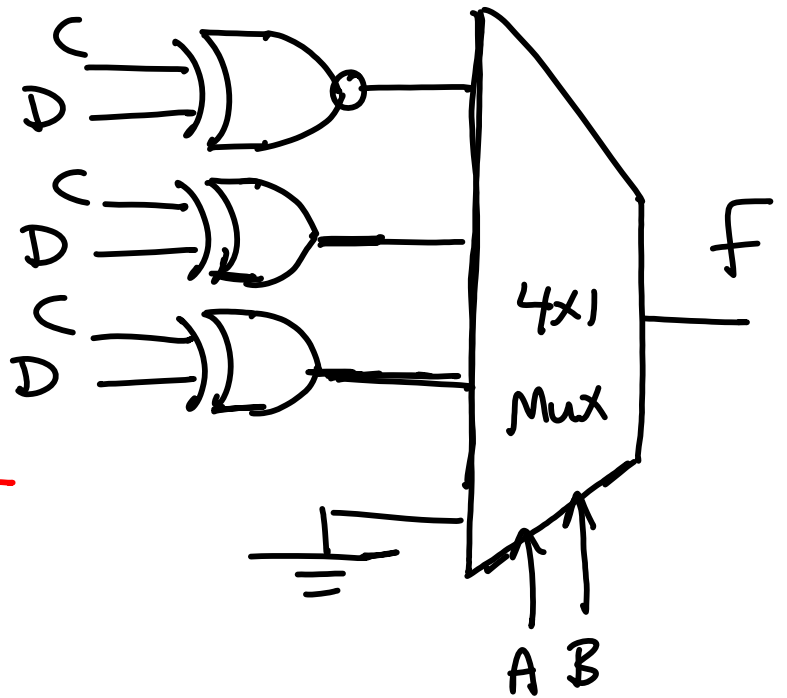
Q3

A



B

A	B	C	D	F
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

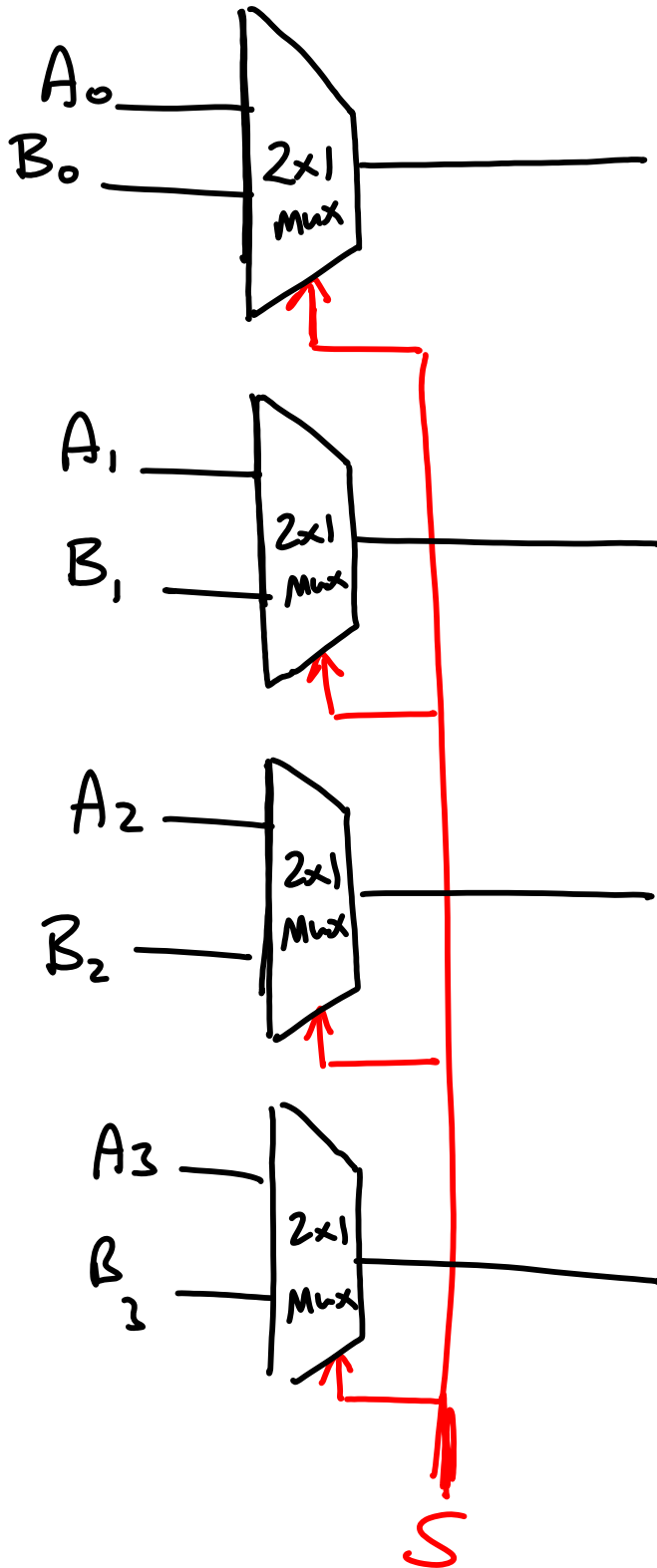


C

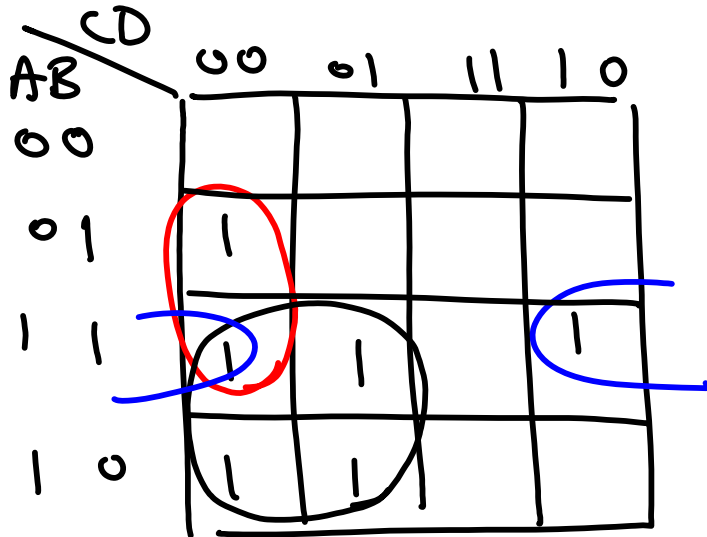
D ₀	D ₁	D ₂	D ₃	x	y
x	x	x	1	1	1
x	x	1	0	1	0
x	1	0	0	0	1
1	0	0	0	0	0

$$x = D_3 + D_2 \bar{D}_3$$
$$x = D_2 + D_3$$
$$y = D_3 + D_1 \bar{D}_2 \bar{D}_3$$

D.



Q4



A

$$F = A\bar{C} + AB\bar{D} + B\bar{C}\bar{D}$$

B

x_1	x_0	f_3	f_2	f_1	f_0
0	0	0	0	0	1
0	1	0	0	1	1
1	0	0	1	1	1
1	1	1	1	0	1

$$3 \Rightarrow 2^3 + 3 + 1 = 13$$

↓
4-bit

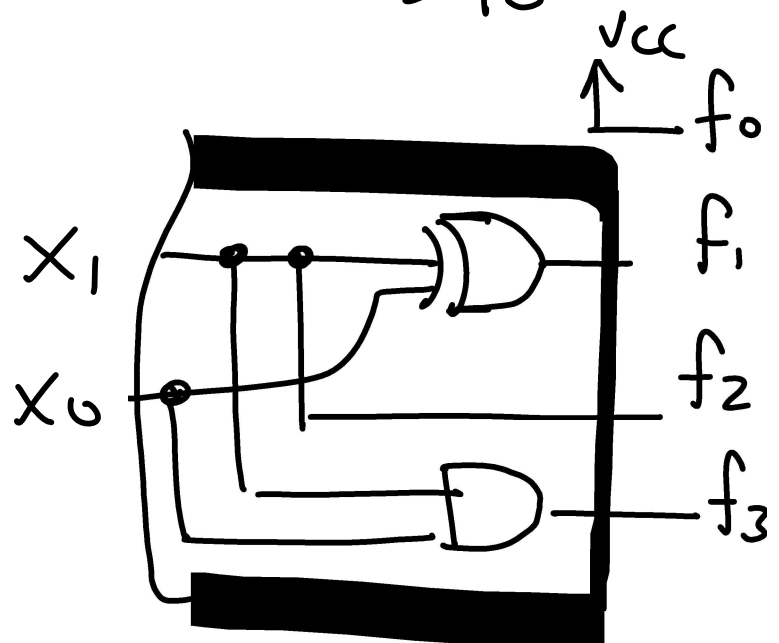
$$\begin{aligned} 0 &\rightarrow 1 \\ 1 &\rightarrow 3 \\ 2 &\rightarrow 7 \\ 3 &\rightarrow 13 \end{aligned}$$

$$f_0 = 1$$

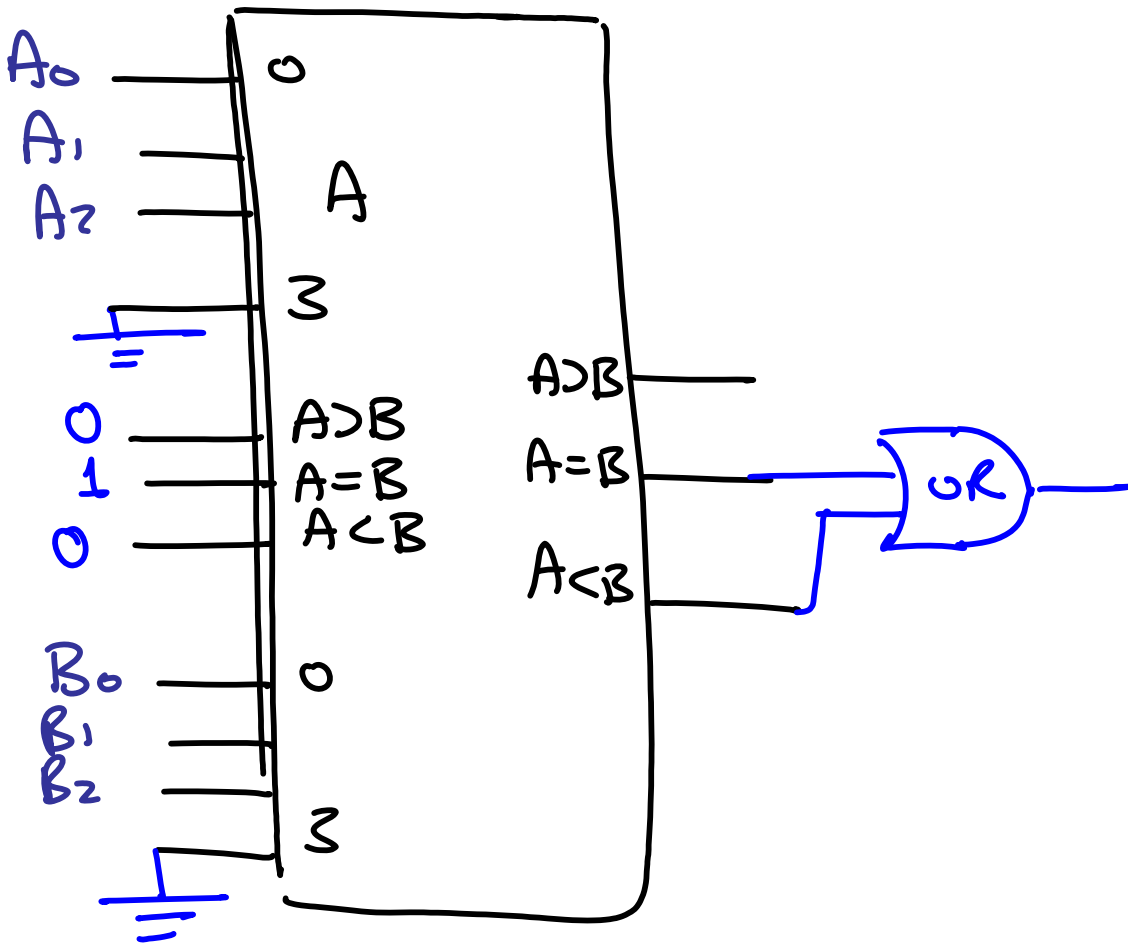
$$f_1 = x_1 \oplus x_0$$

$$f_2 = x_1$$

$$f_3 = x_1 x_0$$



C.



D.

