

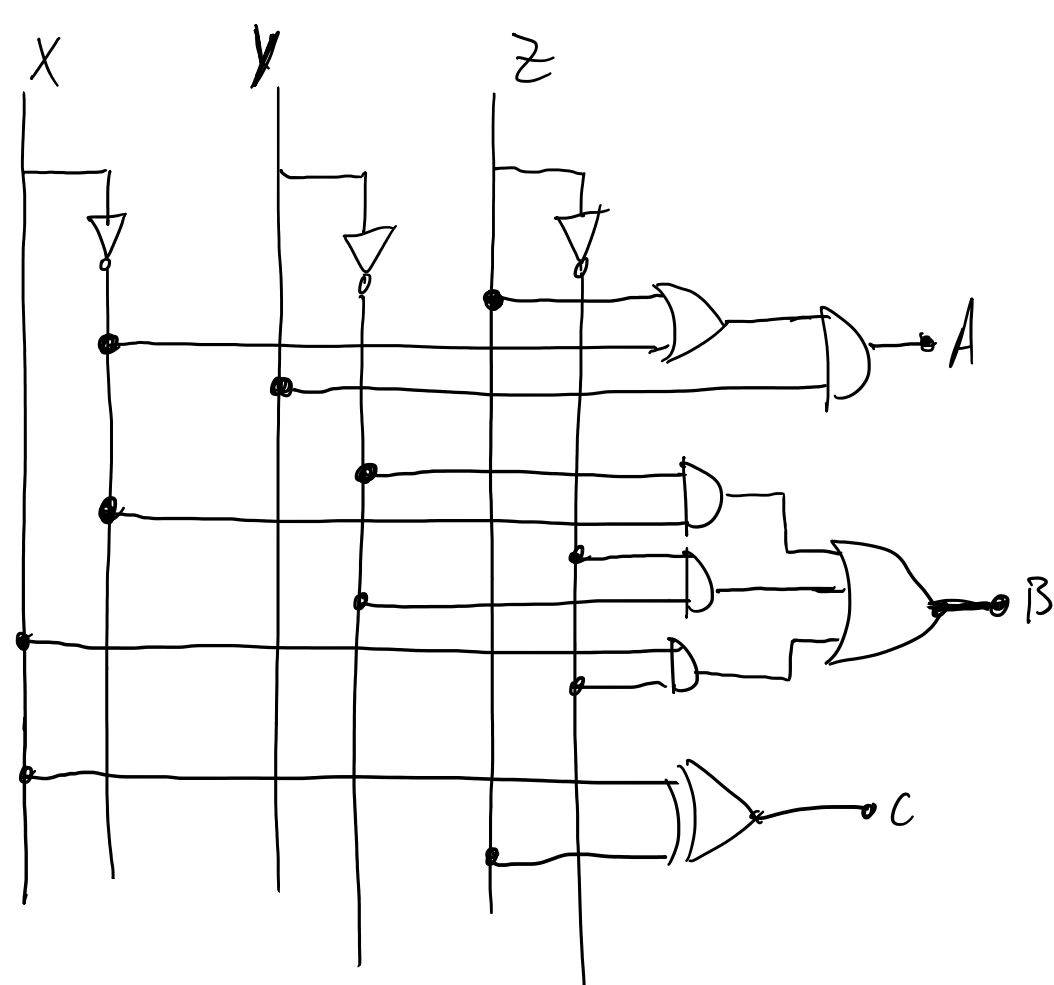
#1

	X	Y	Z	A	B	C	
0	0	0	0	0	1	0	2
1	0	0	1	0	1	1	3
2	0	1	0	1	0	0	4
3	0	1	1	1	0	1	5
4	1	0	0	0	0	1	1
5	1	0	1	0	1	0	2
6	1	1	0	0	1	1	3
7	1	1	1	1	0	0	4

$$A \quad XYZ \rightarrow X'YZ'$$
$$X'YZ$$
$$XYZ$$

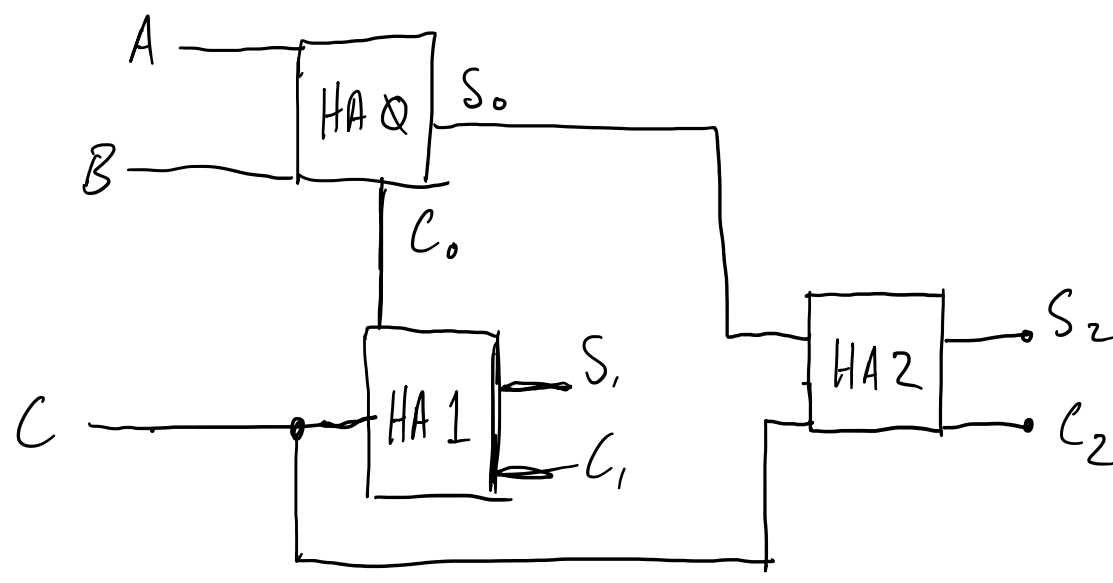
$$C = X'Y'Z + X'YZ + XY'Z + XYZ'$$
$$X'Z + XZ'$$

$$B \rightarrow X'Y'Z' + X'YZ' + XY'Z + XYZ'$$
$$\hookrightarrow X'(Y'Z' + Y'Z) + X(Y'Z + YZ')$$



#2

Sum  $\rightarrow A \oplus B$   
Carry  $\rightarrow AB$



$S_0 = A \oplus B$   
 $C_0 = AB$   
 $S_1 = AB \oplus C \rightarrow \overbrace{AB\bar{C} + \bar{A}BC}^F \rightarrow \bar{A}\bar{B} = \bar{A} + \bar{B}$   
 $C_1 = ABC \rightarrow G$   
 $S_2 = A \oplus B \oplus C \rightarrow D$   
 $C_2 = (A \oplus B)C \rightarrow (\bar{A}\bar{B} + \bar{A}B)C = \bar{A}\bar{B}C + \bar{A}BC = E$

#3

(A)

X <sub>2</sub>	X <sub>1</sub>	X <sub>0</sub>	Y <sub>2</sub>	Y <sub>1</sub>	Y <sub>0</sub>	Output
0	0	0	0	0	0	
0	0	0	0	0	1	1

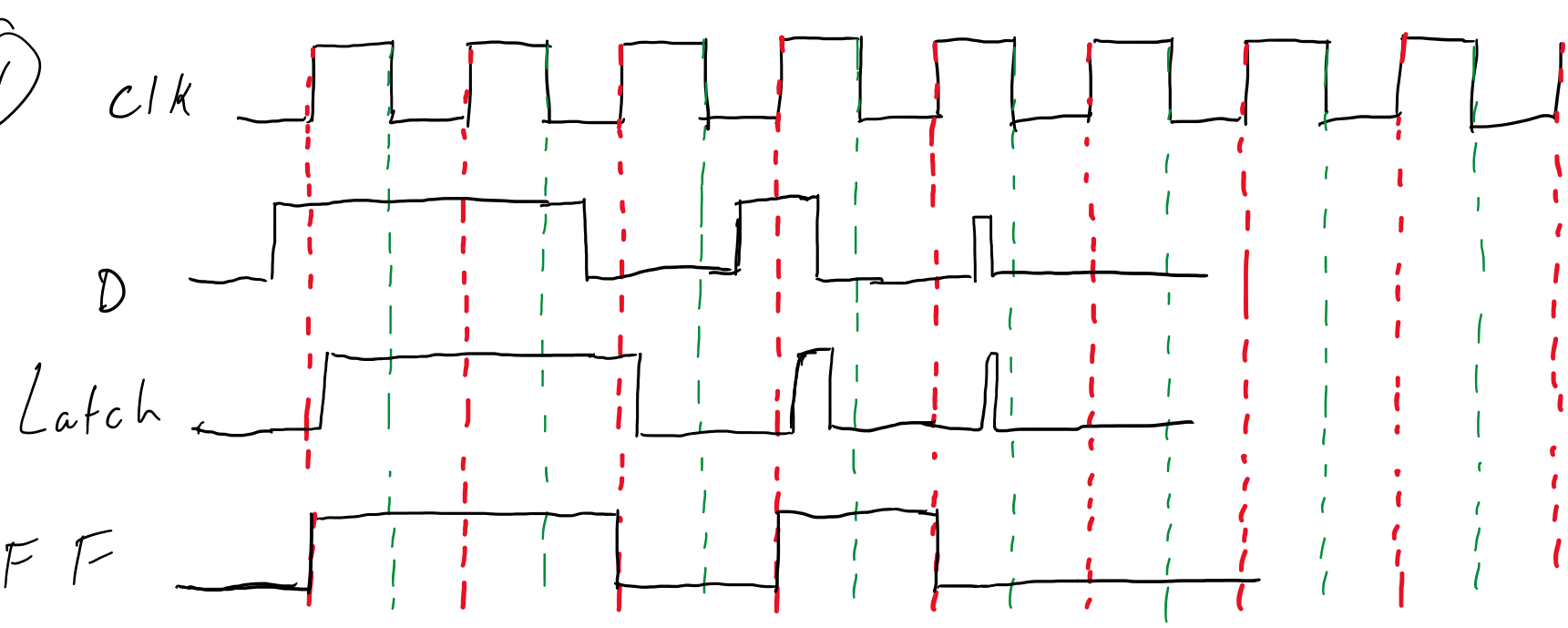
(B)

$(x_2' y_2) + (x_2' y_2' x_1' y_1) + (x_2 y_2 x_1' y_1) +$   
 $(x_2' y_2' x_1' y_1' x_0' y_0) + (x_2' y_2' x_1 y_1 x_0' y_0) +$   
 $(x_2 y_2 x_1' y_1' x_0' y_0) + (x_2 y_2 x_1 y_1 x_0' y_0)$

(C)

$(x_2 y_2) + (x_2' y_2' x_1' y_1) + (x_2 y_2 x_1' y_1) +$   
 $(x_2 y_2 x_1' y_1' x_0' y_0) + (x_2' y_2' x_1 y_1 x_0' y_0) +$   
 $(x_2 y_2 x_1' y_1' x_0' y_0) + (x_2 y_2 x_1 y_1 x_0' y_0)$

#4



#5

$$\begin{array}{r} 543210 \\ 001011 \rightarrow 1011 \\ 101 \overline{) 111011} \\ \underline{101} \phantom{11} \\ 00111 \\ \underline{101} \phantom{1} \\ 0001 \end{array}$$
$$8+2+1=11$$

$$\begin{array}{c} 2^2 \ 2^1 \ 2^0 \\ 110 \quad 4+2+0=6 \\ 101 \rightarrow 4+1=5 \\ 11 \rightarrow 3 \end{array}$$

Rem	Ans
000000	000000
5 000000	000000
4 000000	000000
3 000011	001000
2 000111	001000
1 000111	001010
0 000001	001011

#6

