Fernando Amaro

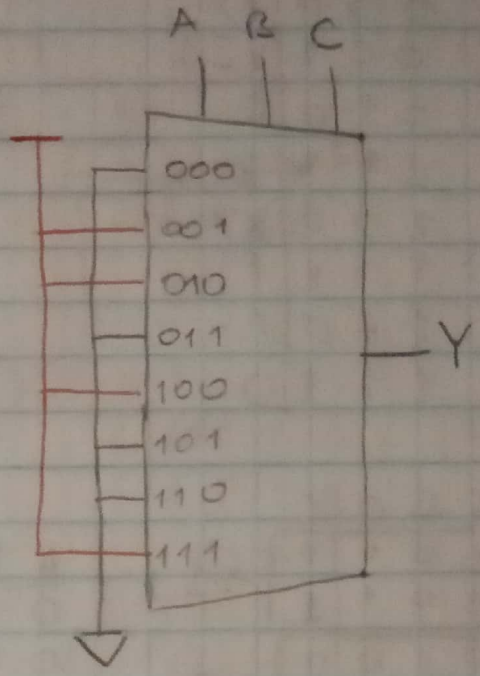
Lab 5 Digital 1

I.

1.

A	B	C	Y
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

a)

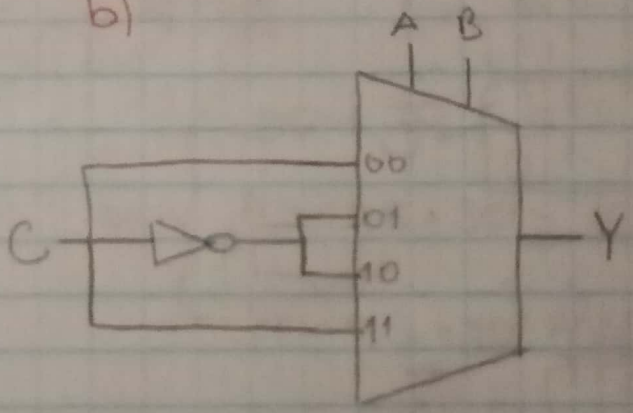


A	B	C	Y	
0	0	0	0	$\bar{C}$
0	0	1	1	
0	1	0	1	C
0	1	1	0	
1	0	0	1	C
1	0	1	0	
1	1	0	0	$\bar{C}$
1	1	1	1	

→

A	B	Y
0	0	C
0	1	$\bar{C}$
1	0	$\bar{C}$
1	1	C

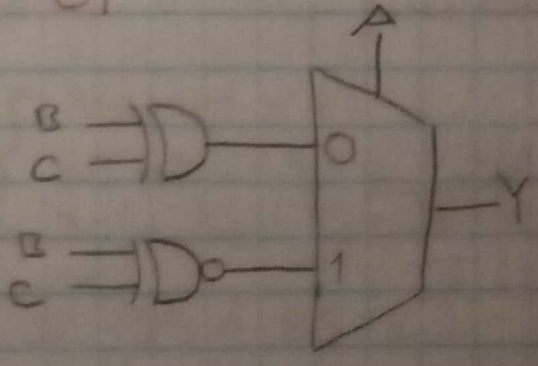
b)



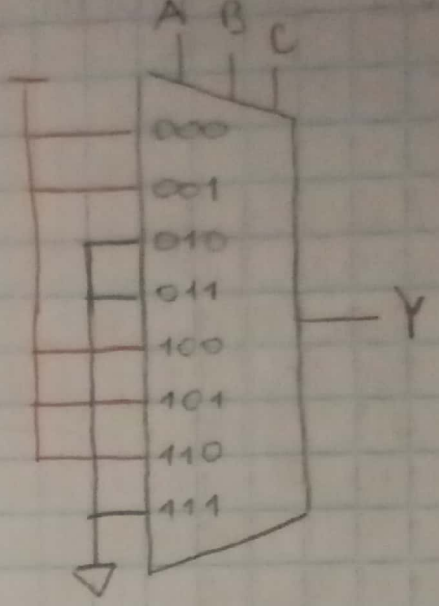
A	B	Y	
0	0	C	$\bar{C}$
0	1	$\bar{C}$	
1	0	$\bar{C}$	C
1	1	C	

A	Y
0	$B \oplus C$
1	$\overline{B \oplus C}$

c)



a)

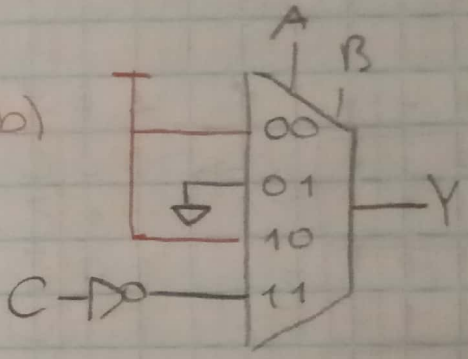


Z	A	B	C	Y
	0	0	0	1
	0	0	1	X ← 1
	0	1	0	0
	0	1	1	0
	1	0	0	X ← 1
	1	0	1	1
	1	1	0	1
	1	1	1	0

A	B	C	Y	
0	0	0	1	→ 1
0	0	1	1	
0	1	0	0	→ 0
0	1	1	0	
1	0	0	1	→ 1
1	0	1	1	
1	1	0	1	→ $\overline{C}$
1	1	1	0	

A	B	Y
0	0	1
0	1	0
1	0	1
1	1	$\overline{C}$

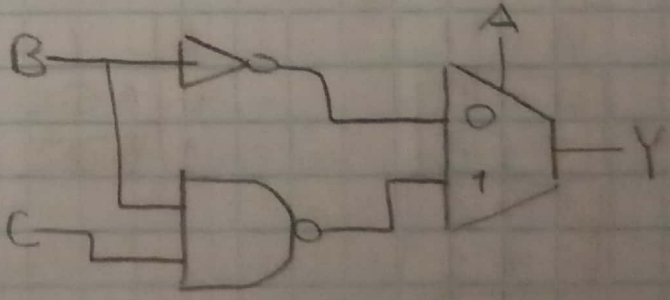
b)



A	B	Y	
0	0	1	→ $\overline{B}$
0	1	0	
1	0	1	→ $\overline{B}\overline{C}$
1	1	$\overline{C}$	

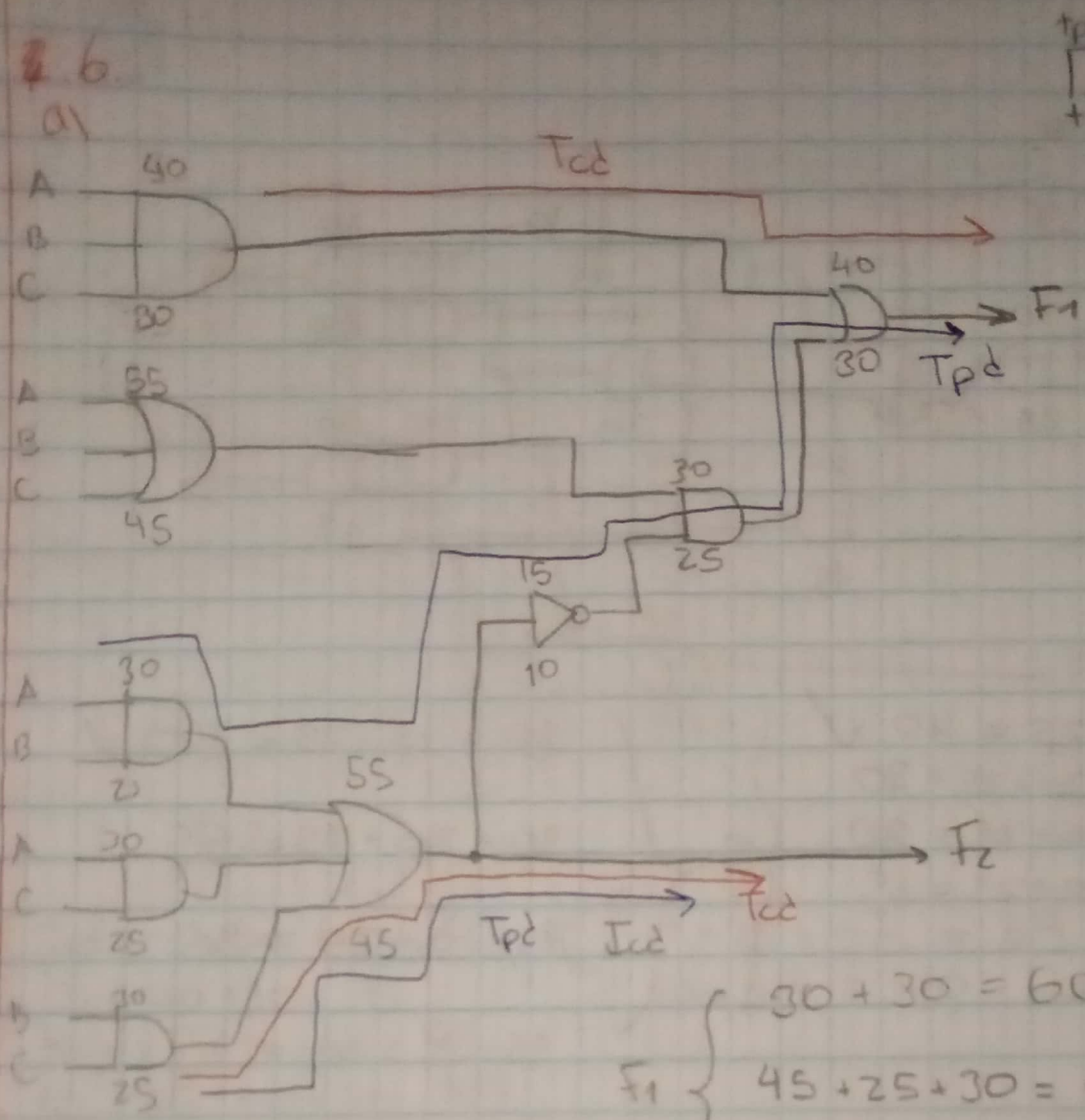
A	Y
0	$\overline{B}$
1	$\overline{B}\overline{C}$

c)



8.6

a)



F_1 { 30 + 30 = 60 ←
45 + 25 + 30 = 100
25 + 45 + 10 + 25 + 30 = 135

b) $F_1 t_{pd} = 190$ ps
$F_1 t_{cd} = 60$ ps

$F_2 t_{pd} = 85$ ps
$F_2 t_{cd} = 70$ ps

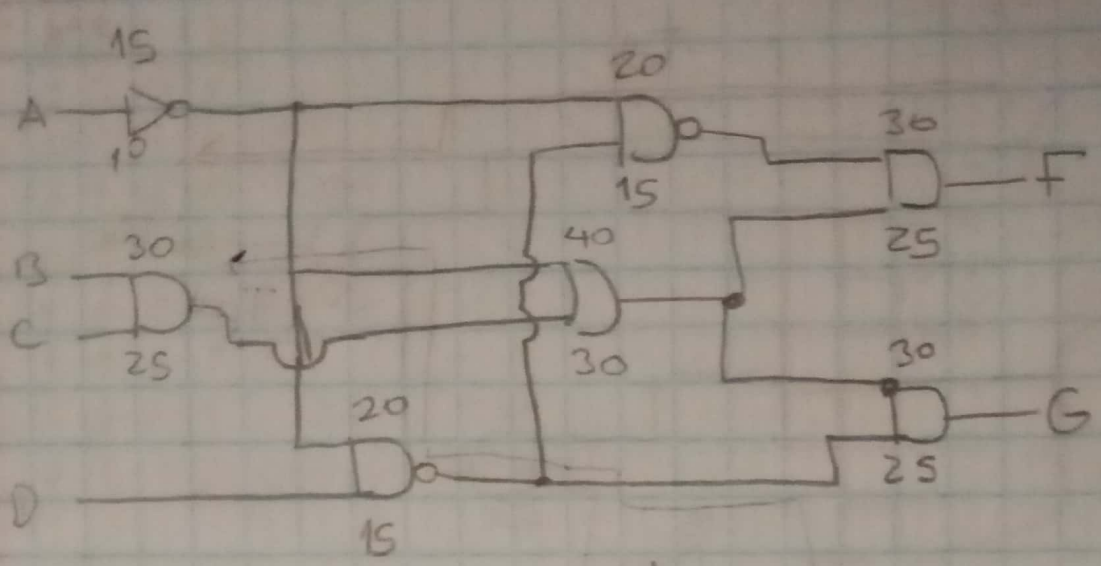
$F_2 = 25 + 45 = 70$ ←

$T_{pd} =$

F_1 { 40 + 40 = 80
55 + 30 + 40 = 125
30 + 55 + 15 + 30 + 40 = 170 ↓

$F_2 = 30 + 55 = 85$ ←

b)



t_{cc}

G { 15 + 25 = 40 ✓
15 + 30 + 25 = 70
25 + 30 + 25 = 80
10 + 30 + 25 = 65

f { 10 + 15 + 25 = 50 ✓
10 + 30 + 25 = 55
25 + 30 + 25 = 80
15 + 15 + 25 = 55

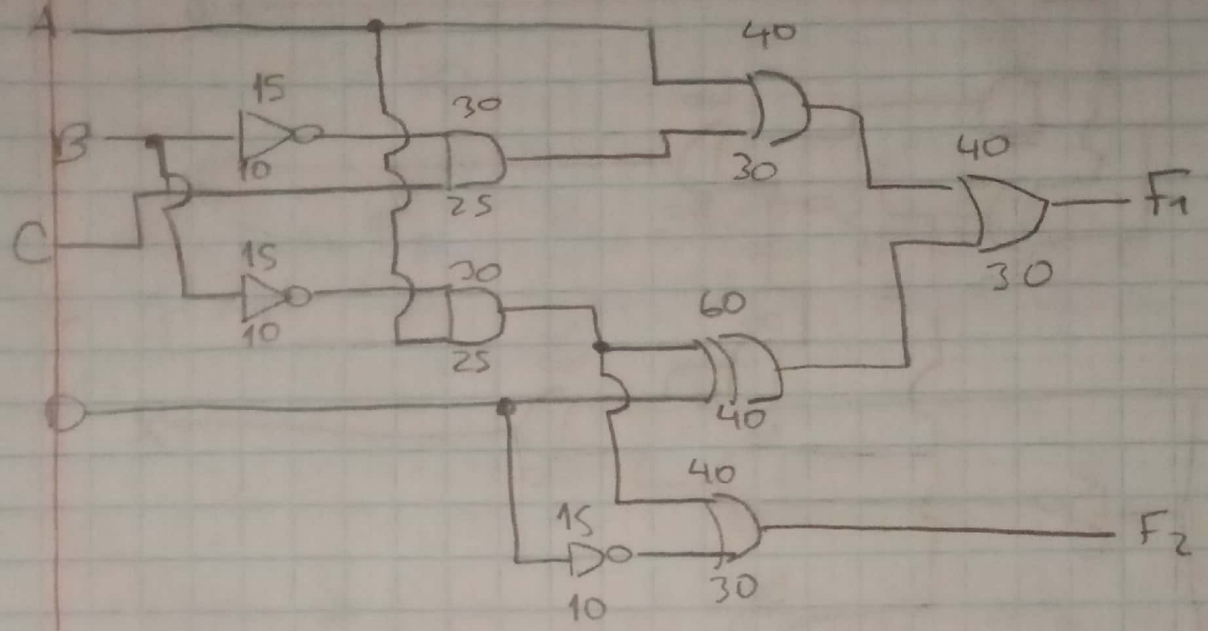
t_{pd}

f { 15 + 20 + 30 = 65
15 + 40 + 30 = 85
30 + 40 + 30 = 100 ✓
20 + 20 + 30 = 70

G { 20 + 30 = 50
30 + 40 + 30 = 100 ✓
15 + 40 + 30 = 85

R// $F_{tcc} = 50_{ps}$ $G_{tcc} = 40_{ps}$
$F_{Tpd} = 100_{ps}$ $G_{tpd} = 100_{ps}$

C)



T_{cd}

F_1
- $30 + 30 = 60$ ✓
- $25 + 40 + 30 = 95$
- $10 + 25 + 30 + 30 = 95$
- $10 + 25 + 40 + 30 = 105$
- $25 + 30 + 30 = 85$

F_2
- $10 + 25 + 30 = 65$
- $10 + 30 = 40$ ✓

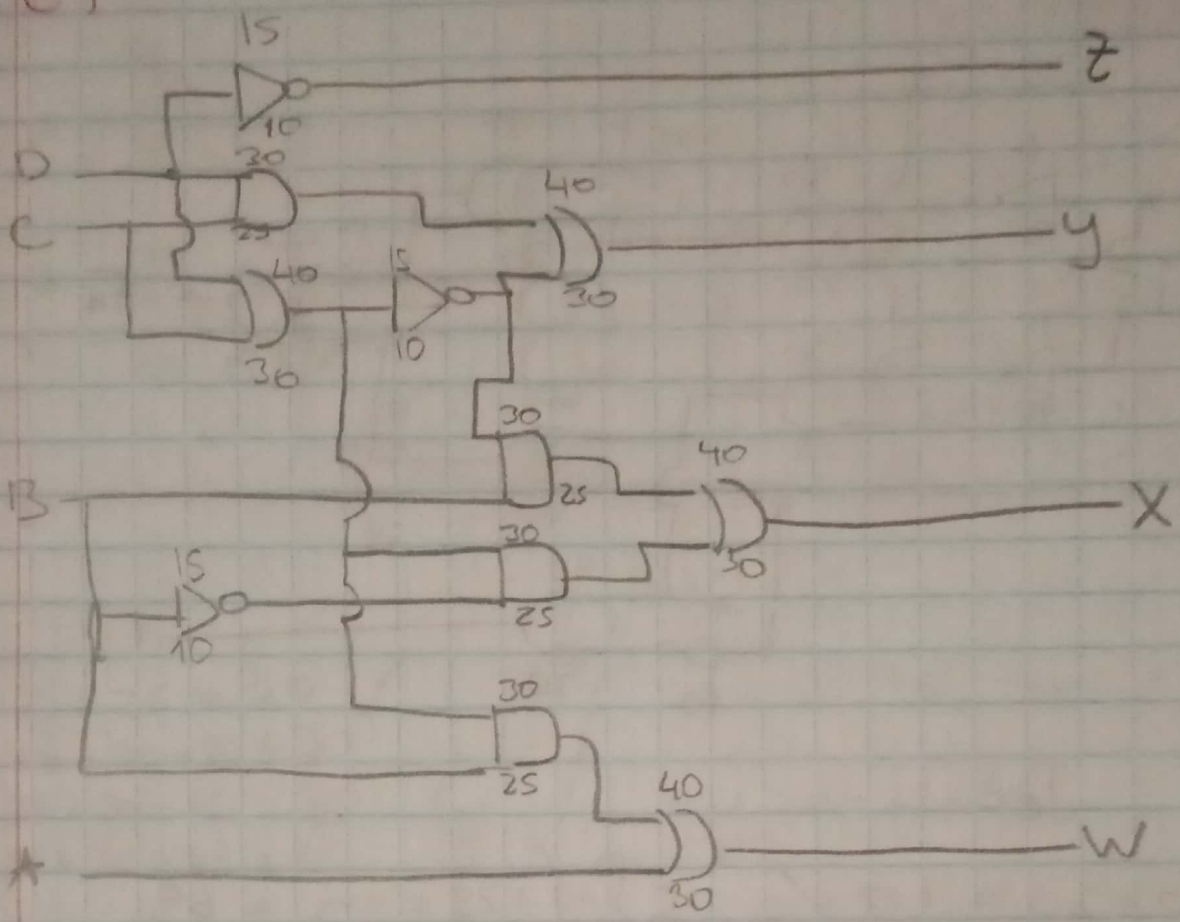
T_{pd}

F_1
- $40 + 40 = 80$
- $15 + 30 + 40 + 40 = 125$
- $15 + 30 + 60 + 40 = 145$ ✓
- $30 + 60 + 40 = 130$
- $60 + 30 = 90$

F_2
- $15 + 40 = 55$
- $15 + 30 + 40 = 85$ ✓

R// $F_1\ t_{cd} = 60_{ps}$ $F_2\ t_{cd} = 40_{ps}$
$F_1\ t_{pd} = 145_{ps}$ $F_2\ t_{pd} = 85_{ps}$

d)



t_{cd}

$z = 10$ ✓

$y \begin{cases} 25 + 30 = 55 \checkmark \\ 30 + 10 + 30 = 70 \end{cases}$

$X \begin{cases} 30 + 10 + 25 + 30 = 95 \\ 30 + 30 = 60 \checkmark \\ 10 + 25 + 30 = 65 \end{cases}$

$W \begin{cases} 30 + 25 + 30 = 85 \\ 30 = 30 \checkmark \\ 25 + 30 = 55 \end{cases}$

t_{pd}

$z = 15$ ✓

$y \begin{cases} 30 + 40 = 70 \\ 40 + 15 + 40 = 95 \checkmark \end{cases}$

$X \begin{cases} 40 + 15 + 30 + 40 = 125 \checkmark \\ 40 + 40 = 80 \\ 15 + 30 + 40 = 85 \end{cases}$

W = { 40 + 30 + 40 = 110 ✓
    { 40 = 40
    { 30 + 40 = 70

R/ $Z_{tcd} = 10_{ps}$ $y_{tcd} = 55_{ps}$ $X_{tcd} = 60_{ps}$ $W_{tcd} = 30_{ps}$
$Z_{tpd} = 15_{ps}$ $y_{tpd} = 95_{ps}$ $X_{tpd} = 125_{ps}$ $W_{tpd} = 110_{ps}$

5.

- Delay de propagación: tiempo entre la entrada y la salida para que esta ultima se estabilize.
- Delay de contaminación: tiempo ~~en~~ para que la salida empieza a desestabilizarse.
- Ruta Crítica: cuando la ruta en propagación es la más alta.
- Ruta Corta: cuando la ruta en contaminación es la más baja.