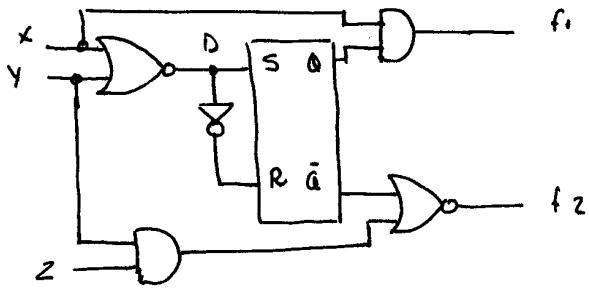


Mayo 94 (2)



$$f_1 = xQ$$

$$f_2 = \overline{(y \cdot z) + Q}$$

$$Q = \overline{x+y}$$

1°

xyz / f1 f2

010
011
100
101
110
111

000,001/00



000/01
001/01

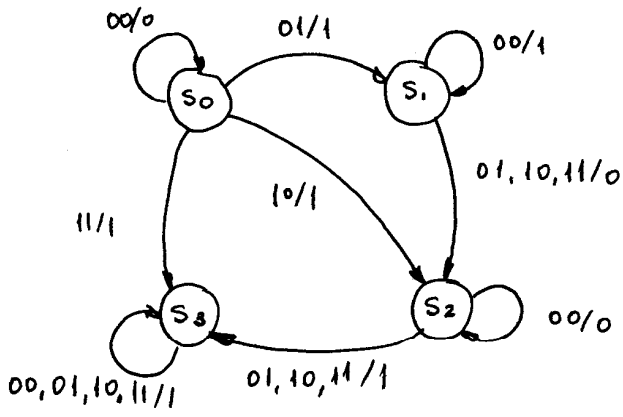
3°

100/11
101/11
010/01
011/00
110/11
111/10

2°

Q	x	y	z	Q	D	f1	f2
0	0	0	0	↓	↓	0	0
0	0	0	1	↓	↓	0	0
0	0	1	0	↓	0	0	0
0	0	1	1	↓	0	0	0
0	1	0	0	↓	0	0	0
0	1	0	1	↓	0	0	0
0	1	1	0	↓	0	0	0
0	1	1	1	↓	0	0	0
1	0	0	0	↓	↓	0	1
1	0	0	1	↓	↓	0	1
1	0	1	0	↓	↓	1	1
1	0	1	1	↓	↓	1	1
1	1	0	0	↓	↓	1	0
1	1	0	1	↓	↓	1	0
1	1	1	0	↓	↓	1	0
1	1	1	1	↓	↓	1	0

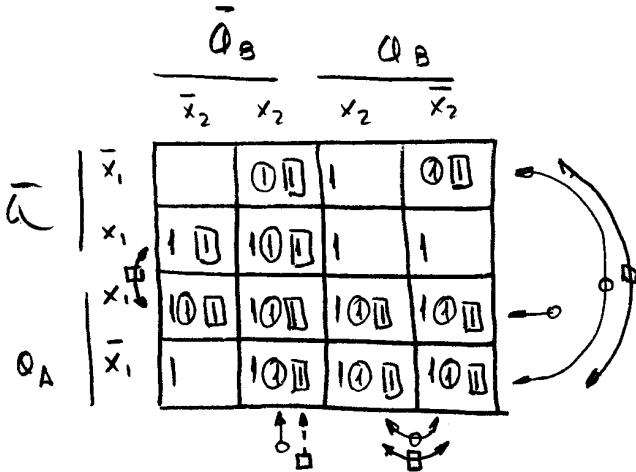
Junio 95 (1)



$S_0 \div S_3 \Rightarrow 2$ básculas

$00/0 \Rightarrow x_1, x_2 / y$

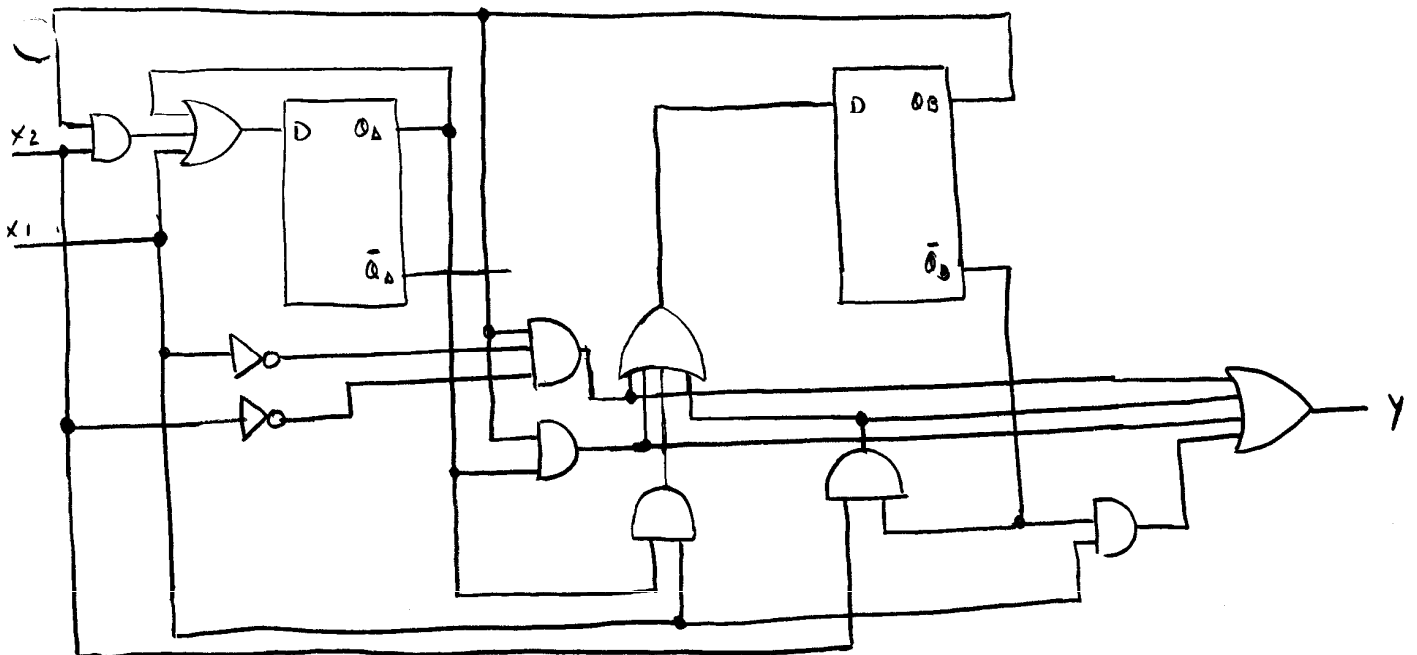
x_1	x_2	Q_A	Q_B	Q_{A+1}	Q_{B+1}	Y
0	0	0	0	0	0	0
0	1	0	0	0	1	1
1	0	0	0	1	0	1
1	1	0	0	1	1	1
0	0	1	1	1	0	0
0	1	1	1	1	0	0
1	0	1	1	1	0	0
1	1	1	1	1	0	0



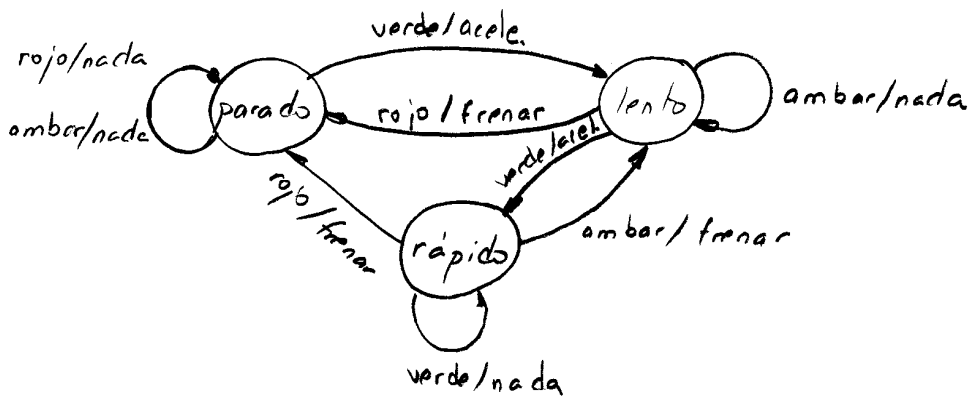
$$Q_{A+1} = Q_A + x_1 + x_2 Q_B$$

$$Q_{B+1} = x_2 \bar{Q}_B + x_1 Q_A + Q_A Q_B + \bar{x}_1 \bar{x}_2 Q_B$$

$$Y = x_2 \bar{Q}_B + x_1 \bar{Q}_B + Q_A Q_B + \bar{x}_1 \bar{x}_2 Q_B$$



Septiembre 93 (1)



Estados $\left\{ \begin{array}{l} \text{parado (00)} \\ \text{lento (01)} \\ \text{rápido (10)} \end{array} \right.$ entradas $\left\{ \begin{array}{l} \text{rojo (r)} \\ \text{ambar (a)} \\ \text{verde (v)} \end{array} \right.$ salidas $\left\{ \begin{array}{l} \text{-nada} \\ \text{-acelerar (A)} \\ \text{-frenar (F)} \end{array} \right.$

\downarrow
 $0_A \ 0_B$

r	a	v	0_A	0_B	0_A	0_B	A	F
1	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0
0	0	1	0	0	0	1	1	0
0	0	0	0	0				
0	1	0	0	0				
1	1	0	0	0				
0	1	0	0	1	0	1	0	0
1	0	0	0	1	0	0	1	0
			0	1				
			0	1				
			0	1				
			0	1				
0	0	1	1	0	1	0	0	0
0	1	0	1	0	0	1	0	1
1	0	0	1	0	0	0	0	1
			1	0				
			1	0				
			1	0				
x	x	x	1	1				

Los imposibles se pueden tomar como 0 o 1 según interese para conseguir máxima simplificación, pq son entradas que nunca se producen.

		\bar{Q}_B				Q_B			
		\bar{v}		v		v		\bar{v}	
		\bar{r}	r	r	\bar{r}	\bar{r}	r	r	\bar{r}
Q_A	\bar{a}	x	0	x	1	1	x	1	x
	a		x	x	x	x	x	x	1
Q_B	a	1	x	x	x	x	x	x	x
	\bar{a}	x	1	x	1	x	x	x	x

$$Q_A = v Q_B + v Q_A = v (Q_B + Q_A)$$

$$Q_B = a Q_B + a Q_A + v \bar{Q}_A \bar{Q}_B$$

$$\Delta = v \bar{Q}_A$$

$$F = r Q_B + \bar{v} Q_A$$

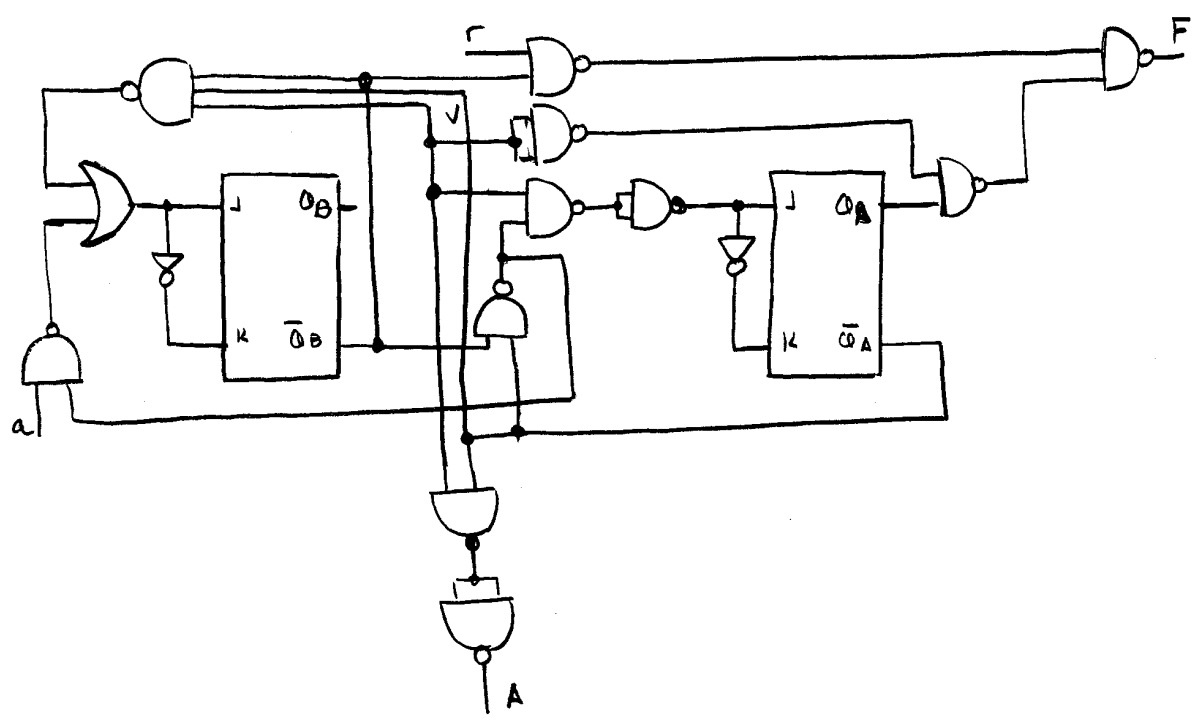
$$Q_A = v (Q_B + Q_A) = v (Q_B + Q_A) = v \bar{Q}_B \cdot \bar{Q}_A$$

$$\Delta = v \bar{Q}_A$$

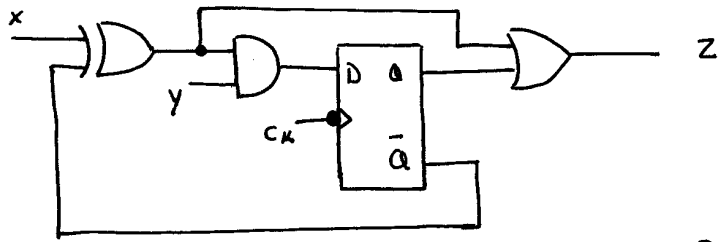
$$Q_B = a (Q_A + Q_B) + v \bar{Q}_A \bar{Q}_B$$

$$Q_B = a (\bar{Q}_B \bar{Q}_A) + v \bar{Q}_A \bar{Q}_B$$

$$F = r Q_B + \bar{v} Q_A = r Q_B + \bar{v} Q_A$$



Septiembre 96

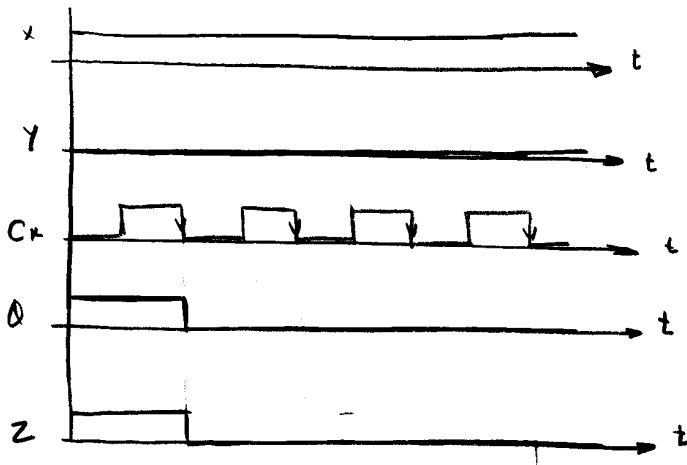
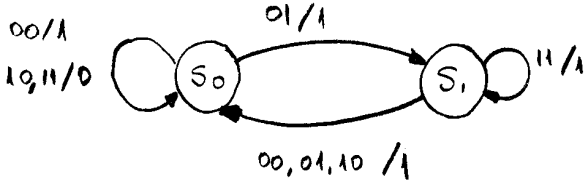


x/y/z

$$D = (x \oplus \bar{Q}) y$$

$$Z = (x \oplus \bar{Q}) + Q =$$

$$Z = xQ + \bar{x}\bar{Q} + Q = Q + \bar{x}$$



Junio 98 (3)

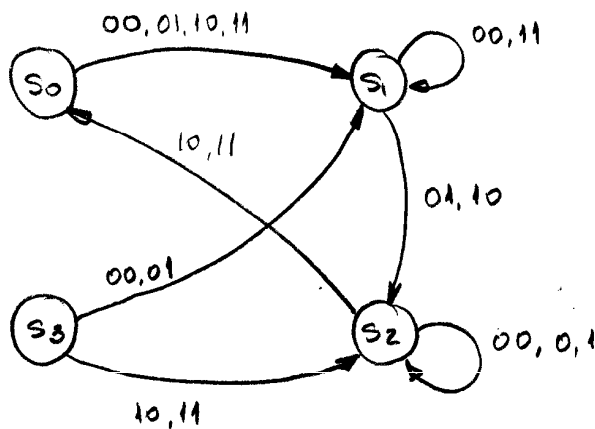
$$J_0 = (x_0 \bar{x}_1 + \bar{x}_0 x_1) \bar{Q}_0 Q_1 = (x_0 \oplus x_1) Q_1 \bar{Q}_0$$

$$K_0 = \frac{x_0 Q_0 \bar{Q}_1 + \bar{x}_0 Q_0 Q_1}{Q_0 (x_0 \oplus Q_1)}$$

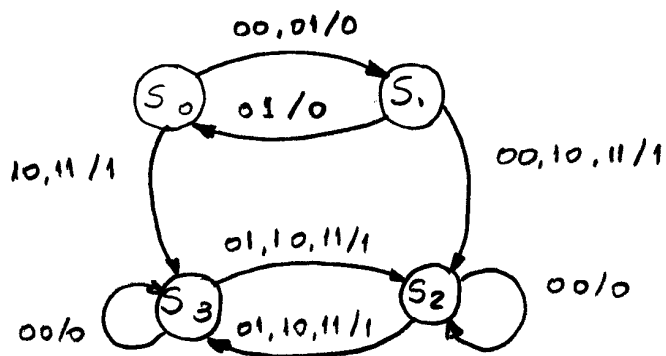
$$J_1 = x_1 Q_0 \bar{Q}_1 + \bar{Q}_0 \bar{Q}_1 = \bar{Q}_1 (\bar{Q}_0 + Q_0 x_1) = \bar{Q}_1 (\bar{Q}_0 + x_1)$$

$$K_1 = (x_0 \oplus x_1) Q_1 \bar{Q}_0 + \bar{x}_1 Q_0 Q_1 = Q_1 (\bar{Q}_0 (x_0 \oplus x_1) + \bar{x}_1 Q_0)$$

x_0	x_1	Q_0	Q_1	J_0	K_0	J_1	K_1	Q_{0+1}	Q_{1+1}
0	0	0	0	0	1	1	0	0	1
0	1	0	0	0	1	1	0	0	1
1	0	0	0	0	1	1	0	0	1
1	1	0	0	0	1	1	0	0	1
0	0	0	1	0	1	0	0	0	1
0	1	0	1	1	1	0	1	1	0
1	0	0	1	1	1	0	1	1	0
1	1	0	1	0	1	0	0	0	1
0	0	1	0	0	0	0	0	1	0
0	1	1	0	0	0	1	0	1	0
1	0	1	0	0	1	0	0	0	0
1	1	1	0	0	1	1	0	0	0
0	0	1	1	0	1	0	1	0	1
0	1	1	1	0	1	0	0	0	1
1	0	1	1	0	0	0	1	1	0
1	1	1	1	0	0	0	0	1	0



Septiembre 98



Estados = 4 \Rightarrow 2 básculas

Entrada = x_1, x_2

Salidas = y

2°

	\bar{Q}_0		Q_0	
	\bar{Q}_0	Q_0	Q_0	\bar{Q}_0
x_1				
\bar{x}_2	0	1 Δ	1 0	1
x_2	0		1 Δ	1 0 Δ
x_2	1 0 Δ	1 Δ	1 Δ	1 0 Δ
\bar{x}_2	1 0 Δ	1 Δ	1 Δ	1 0 Δ

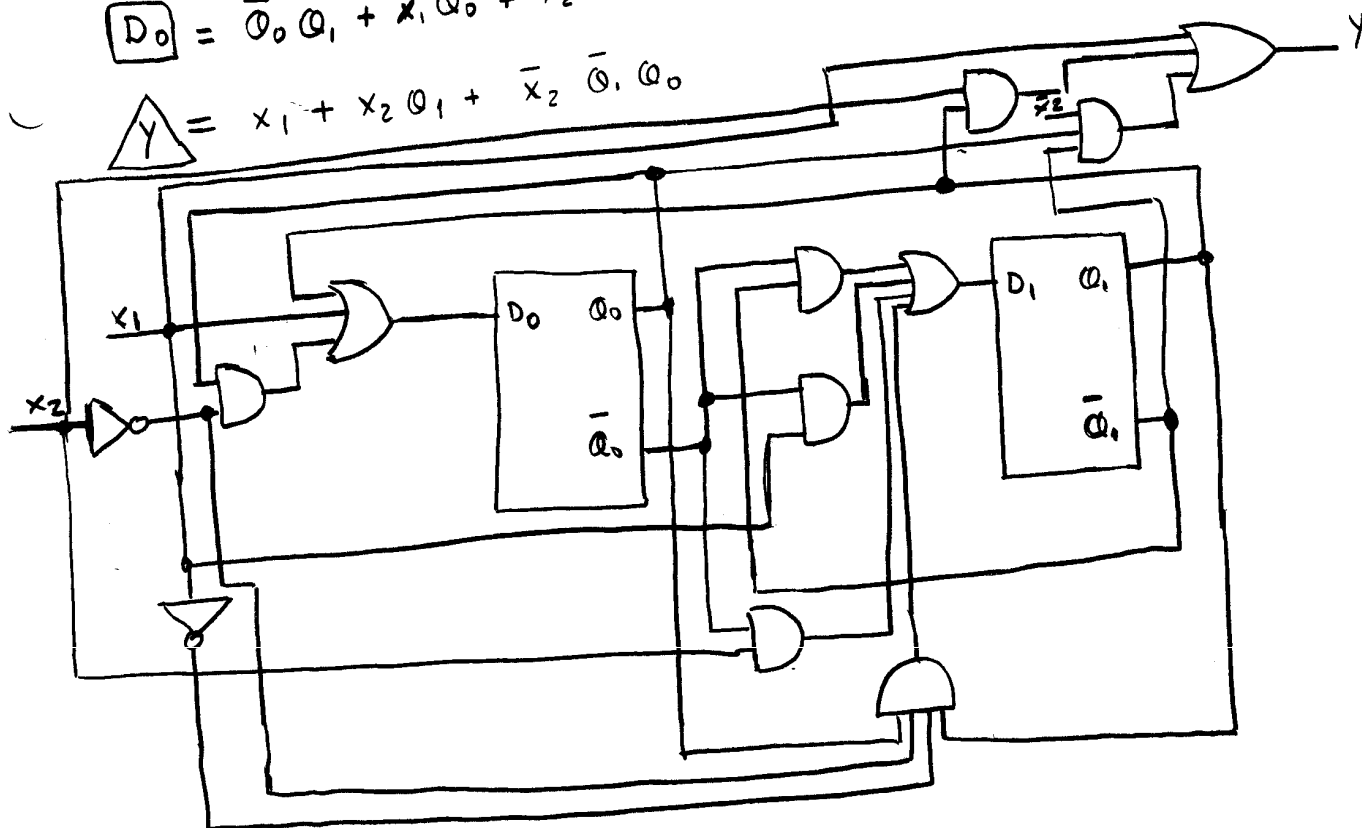
1°

Q_1	Q_0	x_1	x_2	D_1	D_0	Y
0	0	0	0	0	1	0
0	0	0	1	0	1	0
0	0	1	0	1	1	1
0	0	1	1	1	1	1
0	1	0	0	0	0	0
0	1	0	1	0	0	0
0	1	1	0	0	0	0
0	1	1	1	0	0	0
1	0	0	0	0	0	0
1	0	0	1	0	0	0
1	0	1	0	0	0	0
1	0	1	1	0	0	0
1	1	0	0	0	0	0
1	1	0	1	0	0	0
1	1	1	0	0	0	0
1	1	1	1	0	0	0

$$D_1 = x_1 + Q_1 + \bar{x}_2 Q_0$$

$$D_0 = \bar{Q}_0 \bar{Q}_1 + x_1 \bar{Q}_0 + x_2 \bar{Q}_0 + Q_1 Q_0 \bar{x}_1 \bar{x}_2$$

$$Y = x_1 + x_2 Q_1 + \bar{x}_2 \bar{Q}_1 Q_0$$



E.B.7

Mayo 2000 (2)

Junio 2003

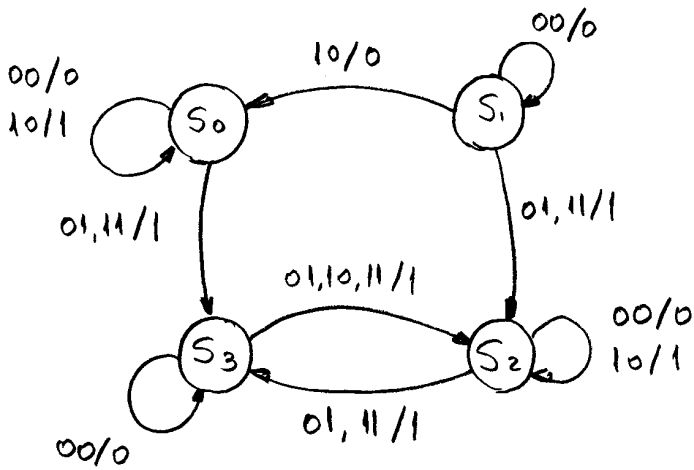
Sep 2003 R

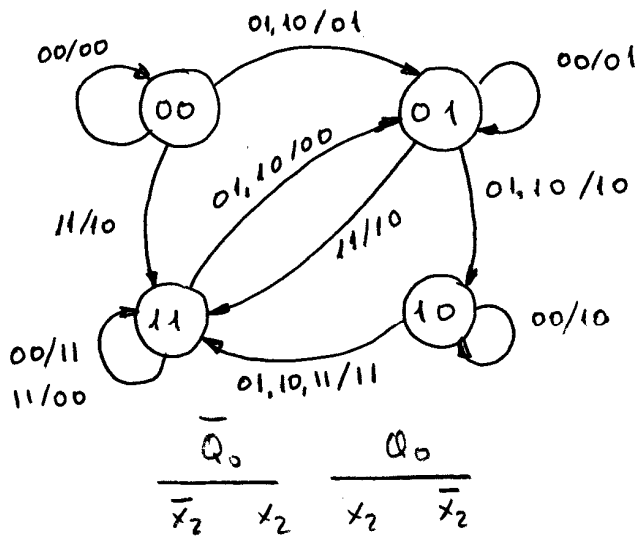
x_2	x_1	ω_A	ω_B	ω_A	ω_B	Y
0	0	0	0	0	0	0
0	1	0	0	1	1	1
1	0	0	0	0	1	1
1	1	0	0	1	1	1
0	0	1	1	0	0	0
0	1	1	1	1	1	1
1	0	1	1	0	0	0
1	1	1	1	1	1	1

$$D_A = x_1 + \omega_A$$

$$D_B = \omega_B \bar{x}_2 \bar{x}_1 + x_1 \bar{\omega}_B =$$

$$Y = (\bar{\omega}_B + \omega_A) x_2 + x_1$$





$Q_1 \quad Q_0 \quad x_1 \quad x_2 \quad y_1 \quad y_2$

x_1	x_2	Q_1	Q_0	Q_1	Q_0	y_1	y_2
0	0	0	0	0	0	0	0
0	1	0	0	0	0	1	0
1	0	0	0	0	0	1	0
1	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0
1	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0

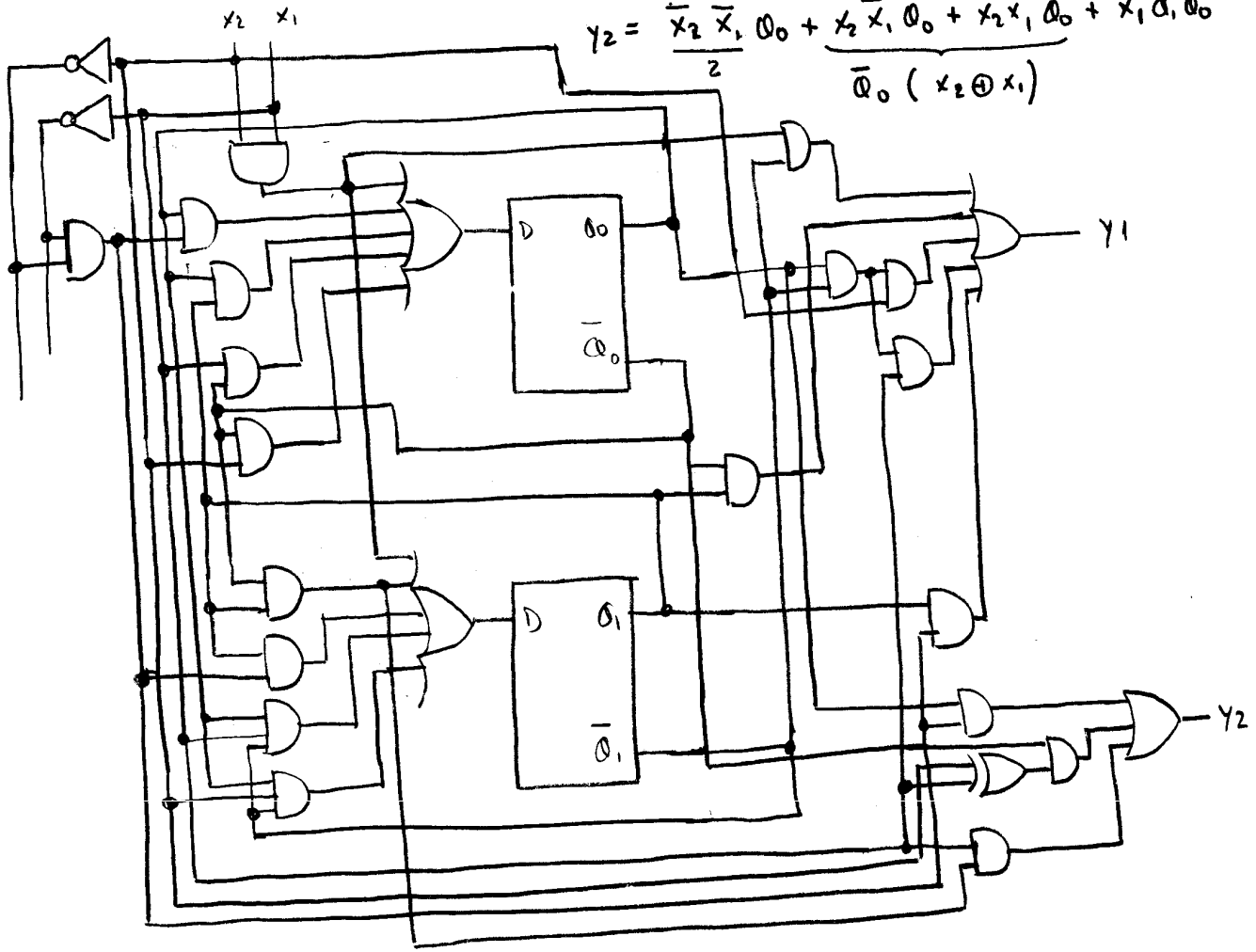
\bar{Q}_0	Q_0
\bar{x}_2	x_2
\bar{x}_1	x_1
x_1	\bar{x}_1

$$Q_1 = \frac{x_2 x_1}{2} + Q_1 \bar{Q}_0 + \frac{\bar{x}_2 \bar{x}_1}{2} Q_1 + x_1 \bar{Q}_1 Q_0 + x_2 \bar{Q}_1 Q_0$$

$$Q_0 = x_2 Q_0 + x_1 \bar{Q}_0 + \frac{x_2 x_1}{2} + Q_0 Q_1 + \frac{\bar{x}_2 \bar{x}_1}{2} Q_0$$

$$y_1 = Q_1 \bar{Q}_0 + \frac{x_2 x_1}{2} \bar{Q}_1 + x_2 \bar{Q}_1 Q_0 + x_1 \bar{Q}_1 Q_0 + \frac{\bar{x}_2 \bar{x}_1}{2} Q_1$$

$$y_2 = \frac{\bar{x}_2 \bar{x}_1}{2} Q_0 + \frac{x_2 \bar{x}_1}{2} Q_0 + \bar{x}_2 x_1 Q_0 + x_1 Q_1 \bar{Q}_0$$



Mayo 2001

Biestables RS

Septiembre 2001

Biestables JK

Septiembre 2002 - Septiembre 2003

Biestables T y D

Junio 2003

Biestables R-S