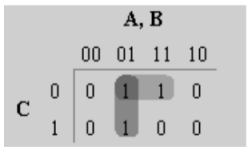
Mapa de Karnaugh

- Agrupamento por múltiplos de potência 2.

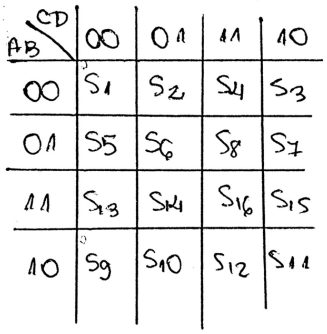


$S = \overline{A}B + B\overline{C}$

Forma disjuntiva

$S = B(\overline{A} + \overline{C})$

Forma conjuntiva

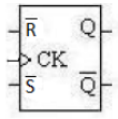


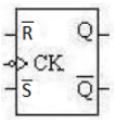
Flip-Flop

- **RS**

CK	$\overline{R}$ $\overline{S}$	Q $\overline{Q}$
0	X X	Qa $\overline{Qa}$
1	X X	Qa $\overline{Qa}$
↓	0 0	Qa $\overline{Qa}$
↓	0 1	0 1
↓	1 0	1 0
↓	1 1	1 1

Sensível a borda de subida





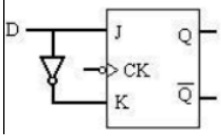
Sensível a borda de descida

- **JK**

CK	J K	Q $\overline{Q}$
0	X X	Qa $\overline{Qa}$
1	X X	Qa $\overline{Qa}$
↓	0 0	Qa $\overline{Qa}$
↓	0 1	0 1
↓	1 0	1 0
↓	1 1	$\overline{Qa}$ Qa

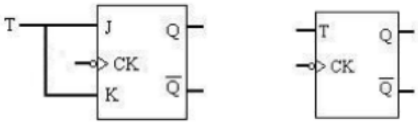
- **D**

CK	D	Q
0	X	Qa
↓	0	0
↓	1	1



- **T**

CK	T	Q
0	X	Qa
↓	0	Qa
↓	1	$\overline{Qa}$



- **JK Master Slave**

PR	CL	CK	J	K	Q
1	0	X	X	X	0
0	1	X	X	X	1
1	1	↓	0	0	Qa
			0	1	0
			1	0	1
			1	1	$\overline{Qa}$

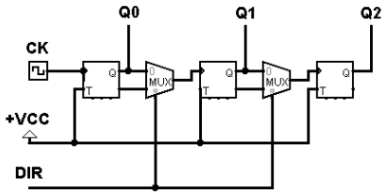
Contadores

1. Diagrama de Estados
2. Tabela de Transição de estados
3. Karnaugh
4. Circuito Lógico

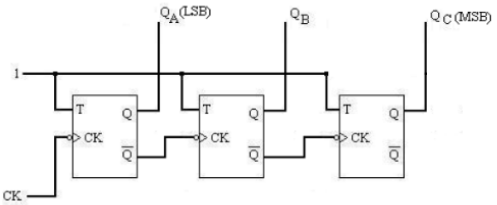
- **Síncronos**

Transição	Possibilidades J K	Conclusão J K
0 → 0	0 0	0 X
	0 1	0 X
0 → 1	1 1	1 X
	1 0	1 X
1 → 0	1 1	X 1
	0 1	X 1
1 → 1	0 0	X 0
	1 0	X 0

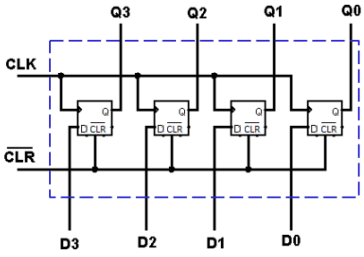
- **Assíncronos**
  - Crescente/Decrescente



  - Decrescente



Registradores



- Shift-Registers

Pulsos De Clock	$\overline{CLR}$ E	Q3 Q2 Q1 Q0
0	0 X	0 0 0 0
1	1 1	1 0 0 0
2	1 1	1 1 0 0
3	1 0	0 1 1 0
4	1 1	1 0 1 1
5	1 0	0 1 0 1
6	1 0	0 0 1 0
7	1 0	0 0 0 1
8	1 0	0 0 0 0