

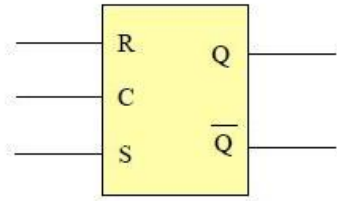
Sistemas Digitais

Diagramas Temporais: Flip-Flop,
Latches e Registradores.

Latches, Flip-Flops e Registradores

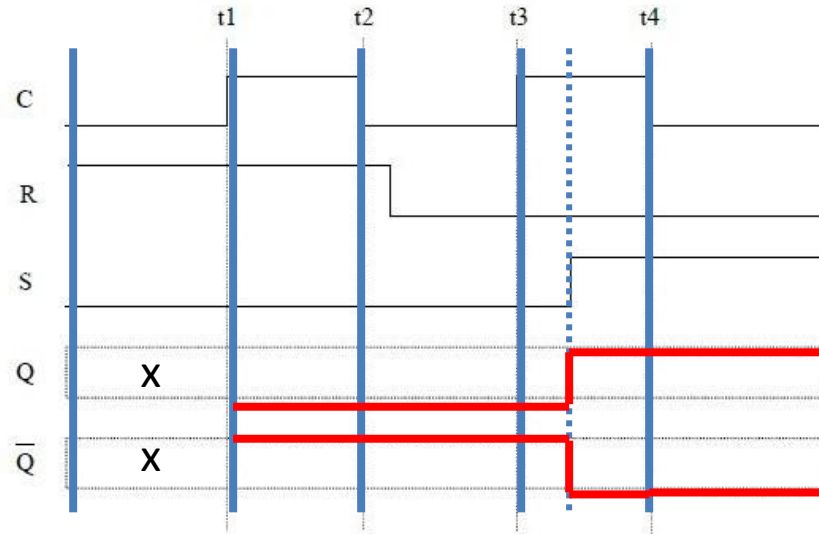
O Latch RS Controlado

Exemplo



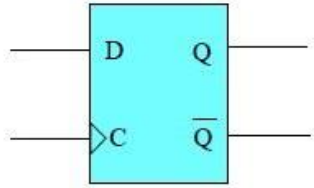
C	R	S	Q_{t+1}
0	X	X	Q_t
1	0	0	Q_t
1	0	1	1
1	1	0	0
1	1	1	-

tabela de transição
de estados



Latches, Flip-Flops e Registradores

O Flip-flop D disparado pela borda ascendente



C	D	Q_{t+1}
$\neq \uparrow$	X	Q_t
\uparrow	0	0
\uparrow	1	1

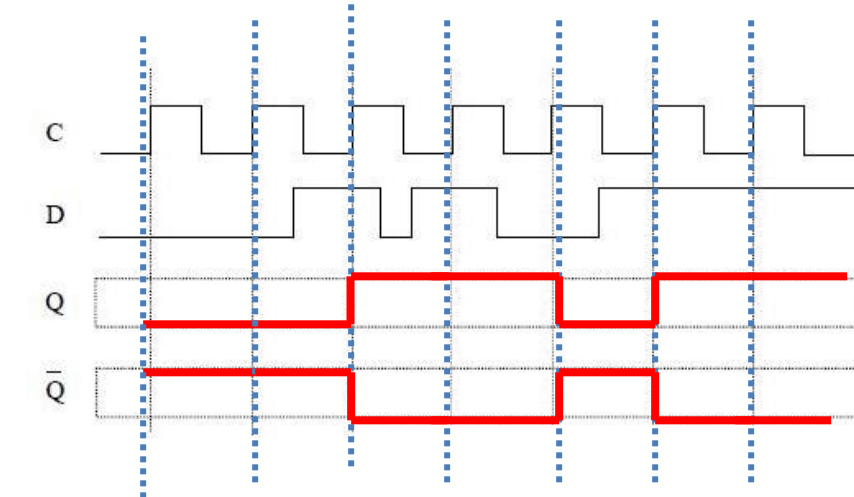


tabela de transição
de estados

Latches, Flip-Flops e Registradores

O Flip-flop JK (disparado pela borda ascendente)

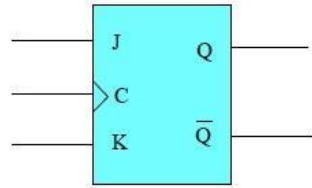
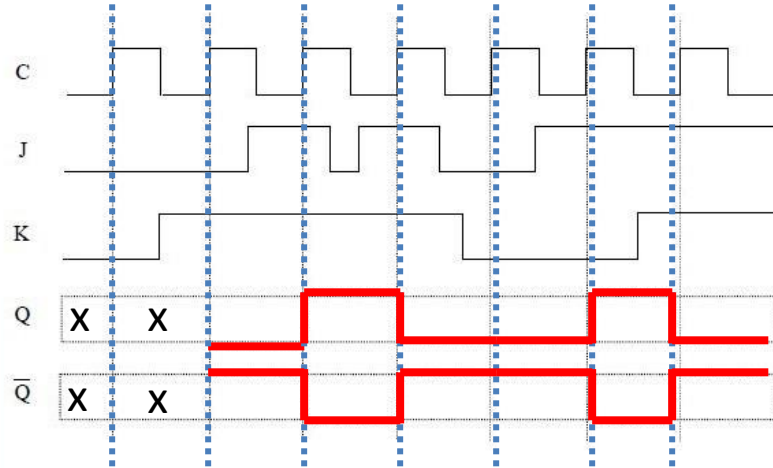


tabela de transição
de estados

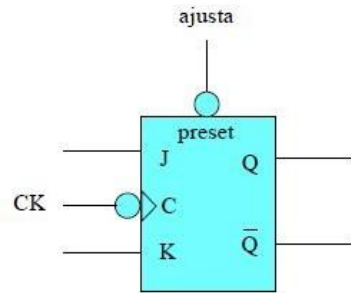
C	J	K	Q_{t+1}
$\neg \uparrow$	X	X	Q_t
\uparrow	0	0	Q_t
\uparrow	0	1	0
\uparrow	1	0	1
\uparrow	1	1	$\overline{Q_t}$

Exemplo



Latches, Flip-Flops e Registradores

Flip-flops com set e reset assíncronos



C	J	K	Q_{t+1}
$\neq \downarrow$	X	X	Q_t
\downarrow	0	0	Q_t
\downarrow	0	1	0
\downarrow	1	0	1
\downarrow	1	1	\bar{Q}_t

Exemplo

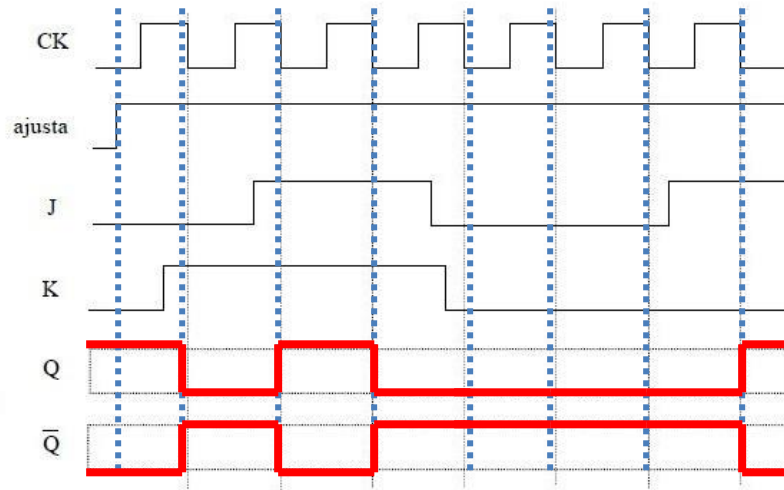
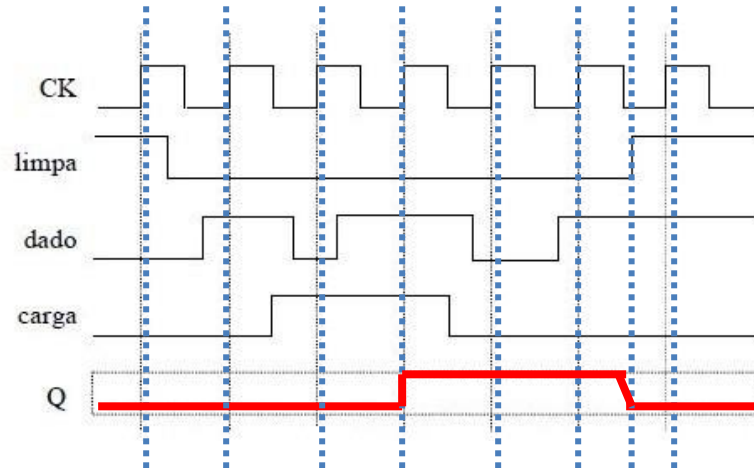
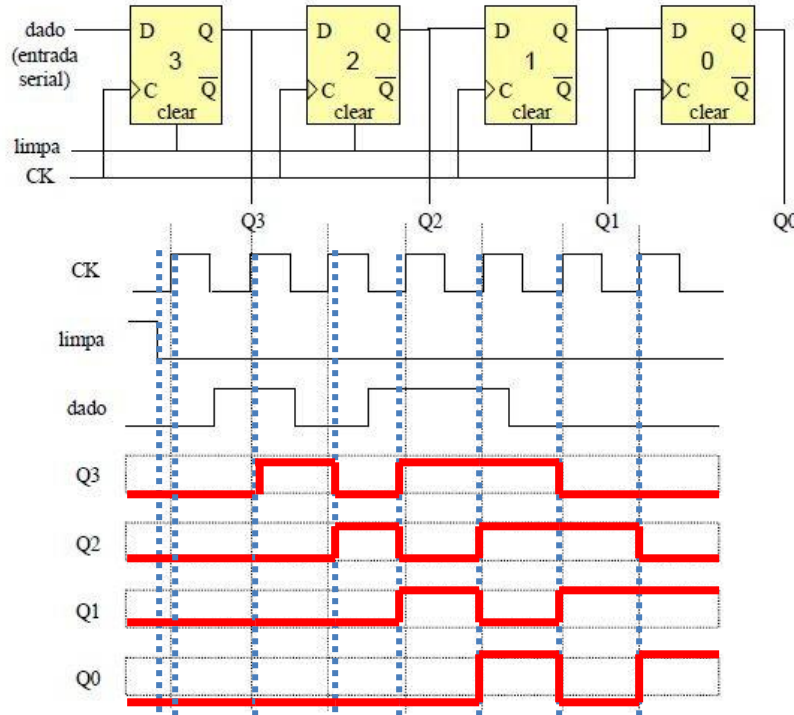


tabela de transição
de estados



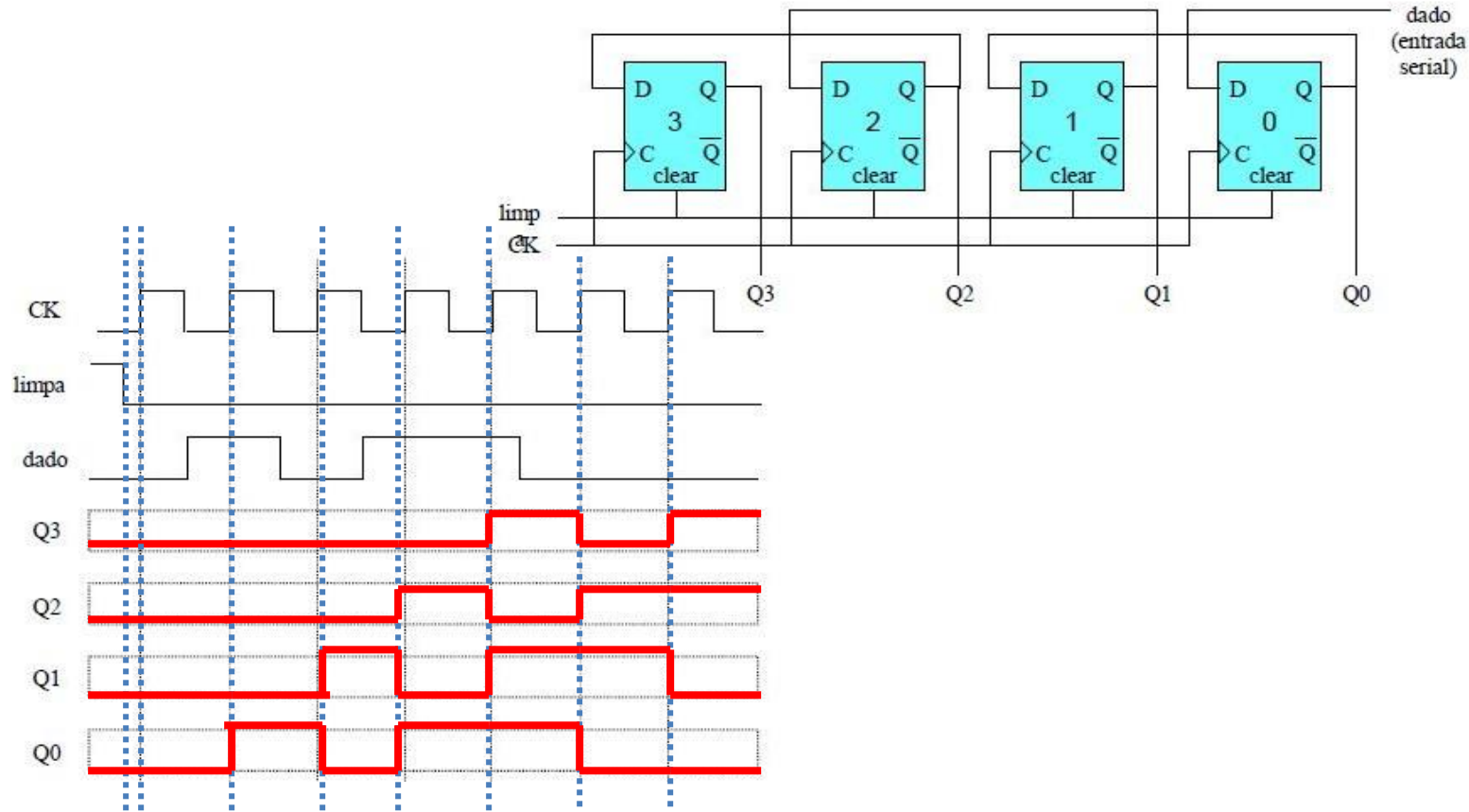
Latches, Flip-Flops e Registradores

Registrador de deslocamento (à direita)



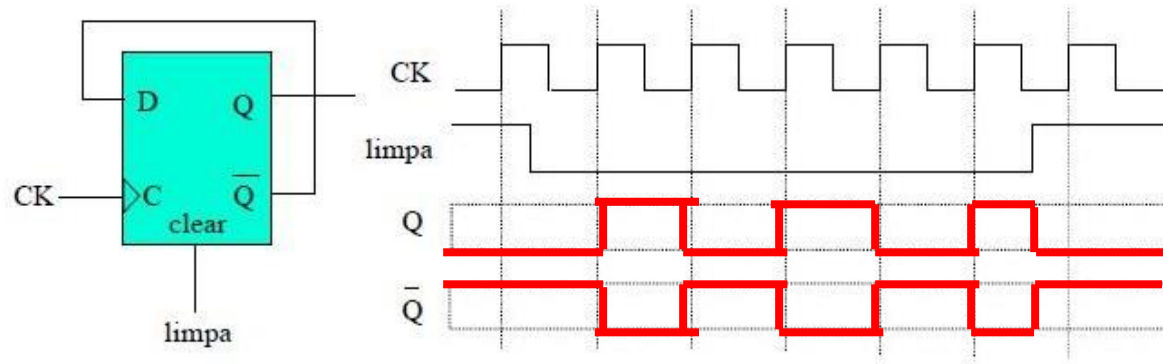
Latches, Flip-Flops e Registradores

Registrador de deslocamento (à esquerda)

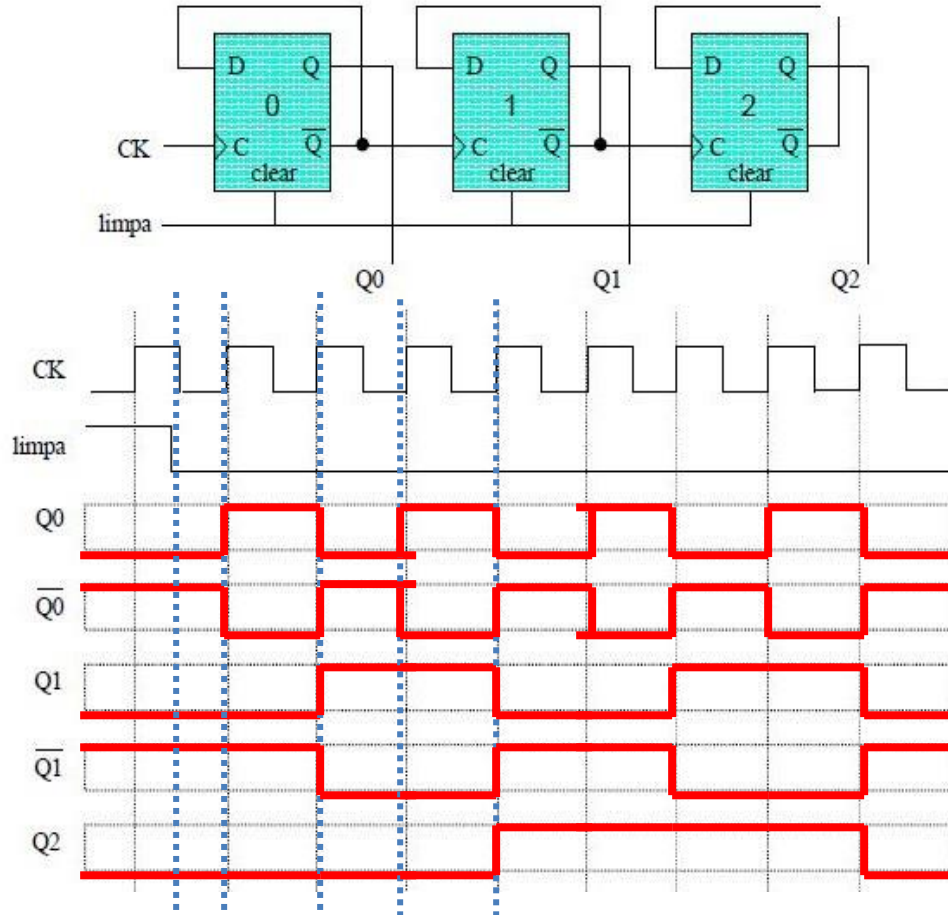


Latches, Flip-Flops e Registradores

Registrador contador (1 bit)



Registrador contador (3 bits)



Latches,
Flip-Flops e
Registrador
es