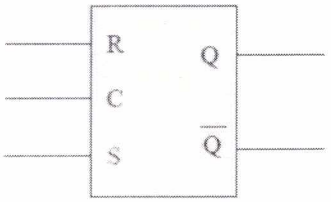
Latches, Flip-Flops e Registradores

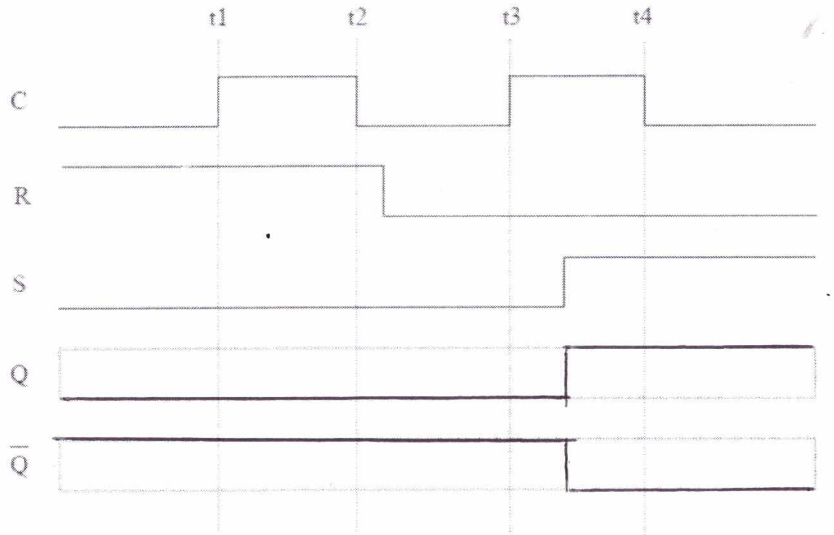
O Latch RS Controlado



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	-

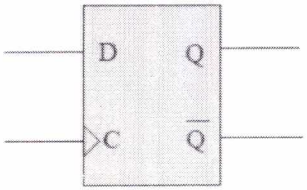
tabela de transição de estados

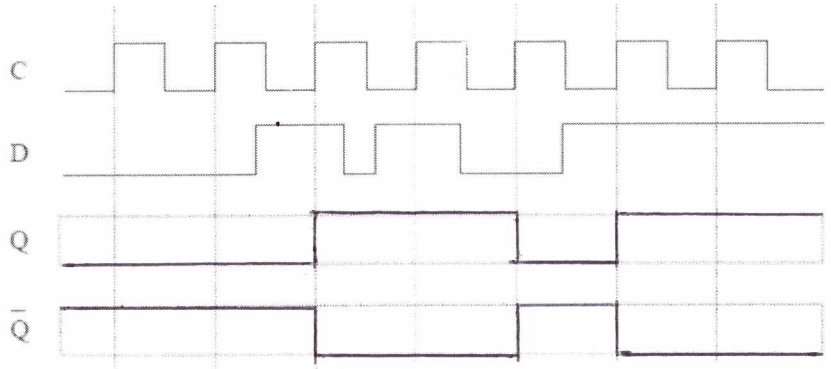
Exemplo



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)

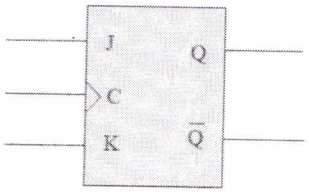
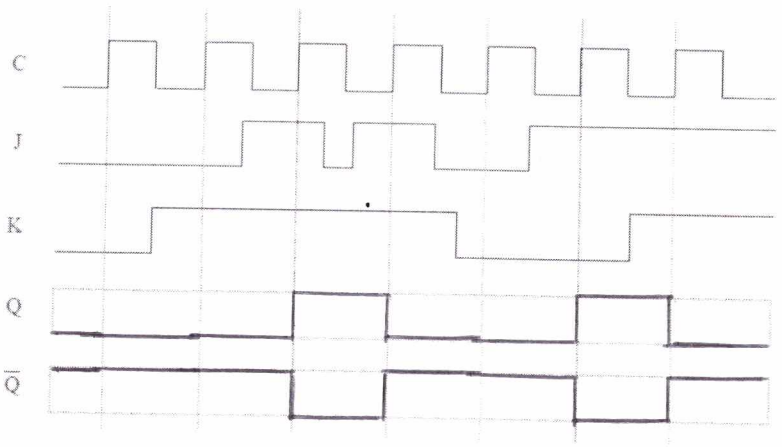


tabela de transição de estados

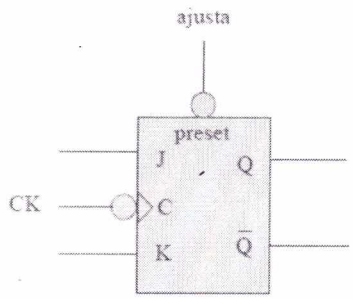
C	J	K	Q_{t+1}
$\neq\uparrow$	X	X	Q_t
$\uparrow$	0	0	Q_t
$\uparrow$	0	1	0
$\uparrow$	1	0	1
$\uparrow$	1	1	$\overline{Q_t}$

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	Q_t

Exemplo

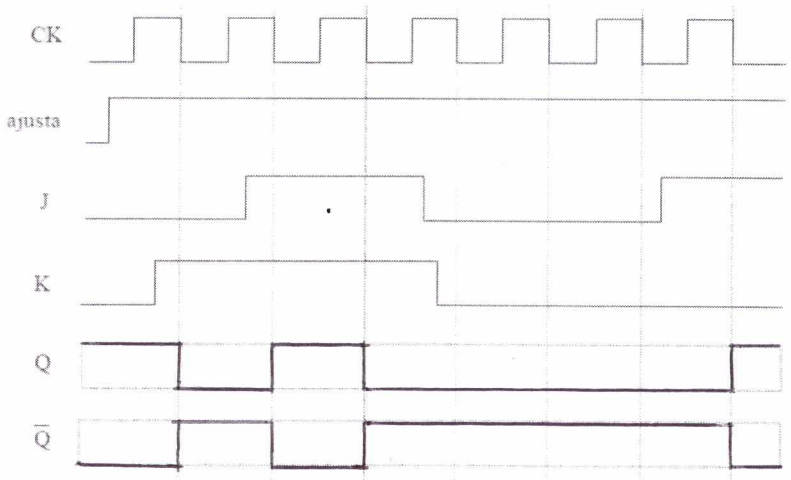
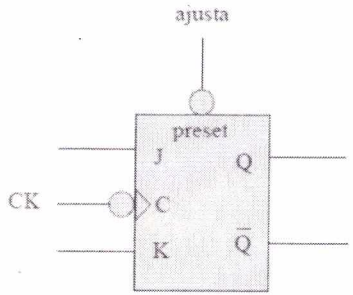


tabela de transição de estados

De acordo com tabela verdade encontrado em vídeo aula.

Latches, Flip-Flops e Registradores

Flip-flops com set e reset assíncronos



C	J	K	Q_{t+1}
↑↓	X	X	Q_t
↓	0	0	Q_t
↓	0	1	0
↓	1	0	1
↓	1	1	Q_t

Exemplo

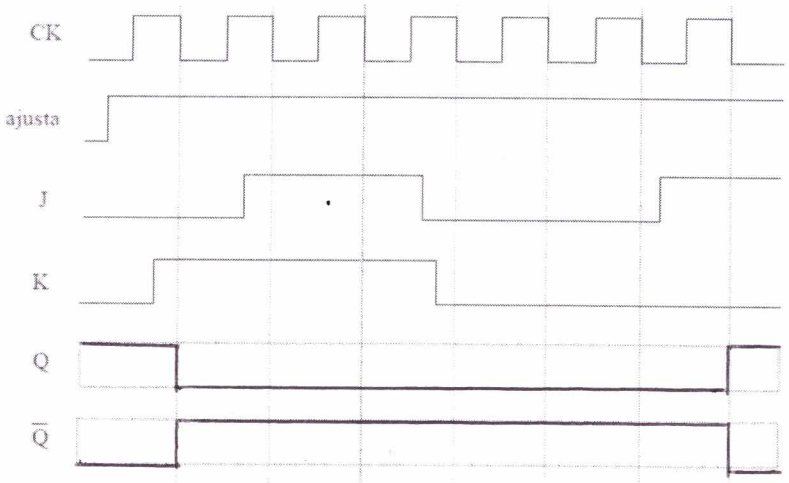


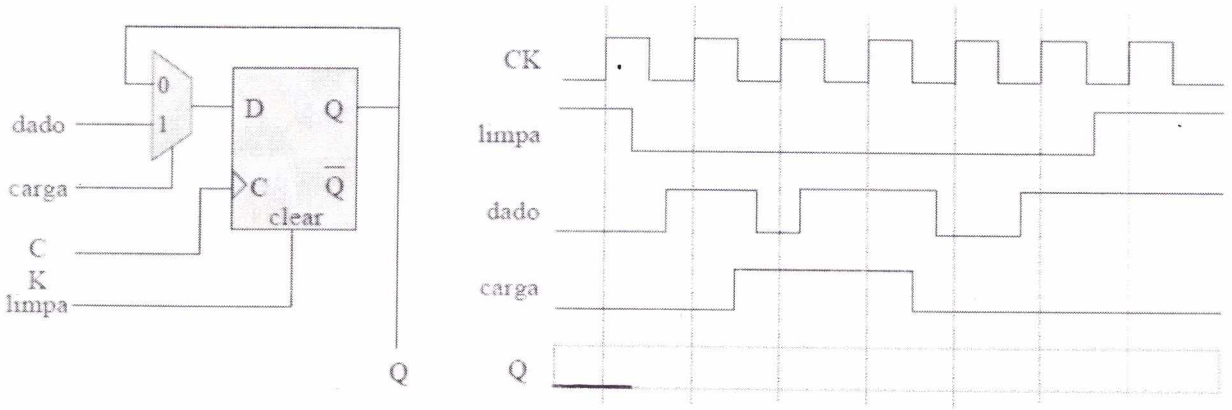
tabela de transição de estados

De acordo com tabela-verdade dado no slide.

Latches, Flip-Flops e Registradores

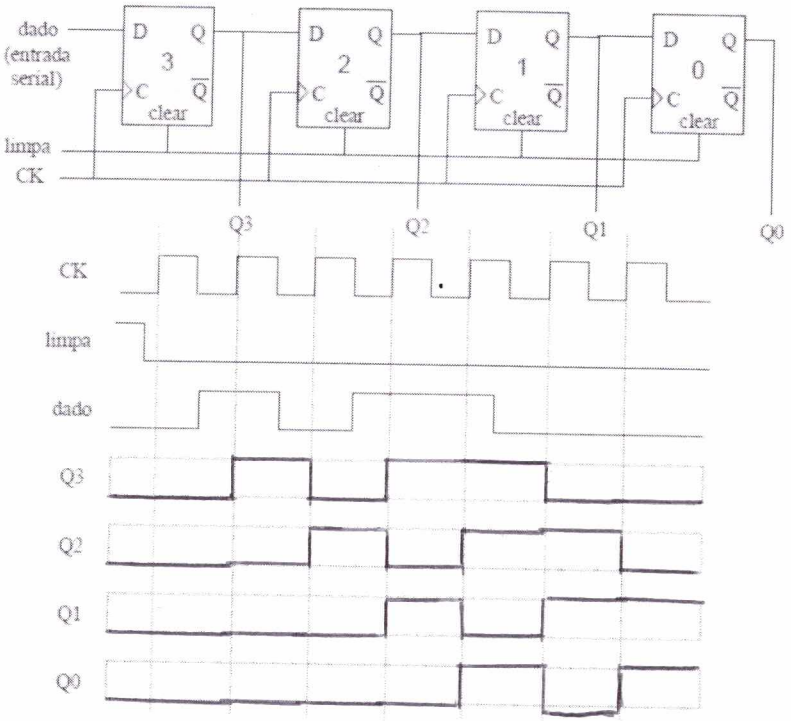
Registrador com carga paralela (versão 2)

Exemplo



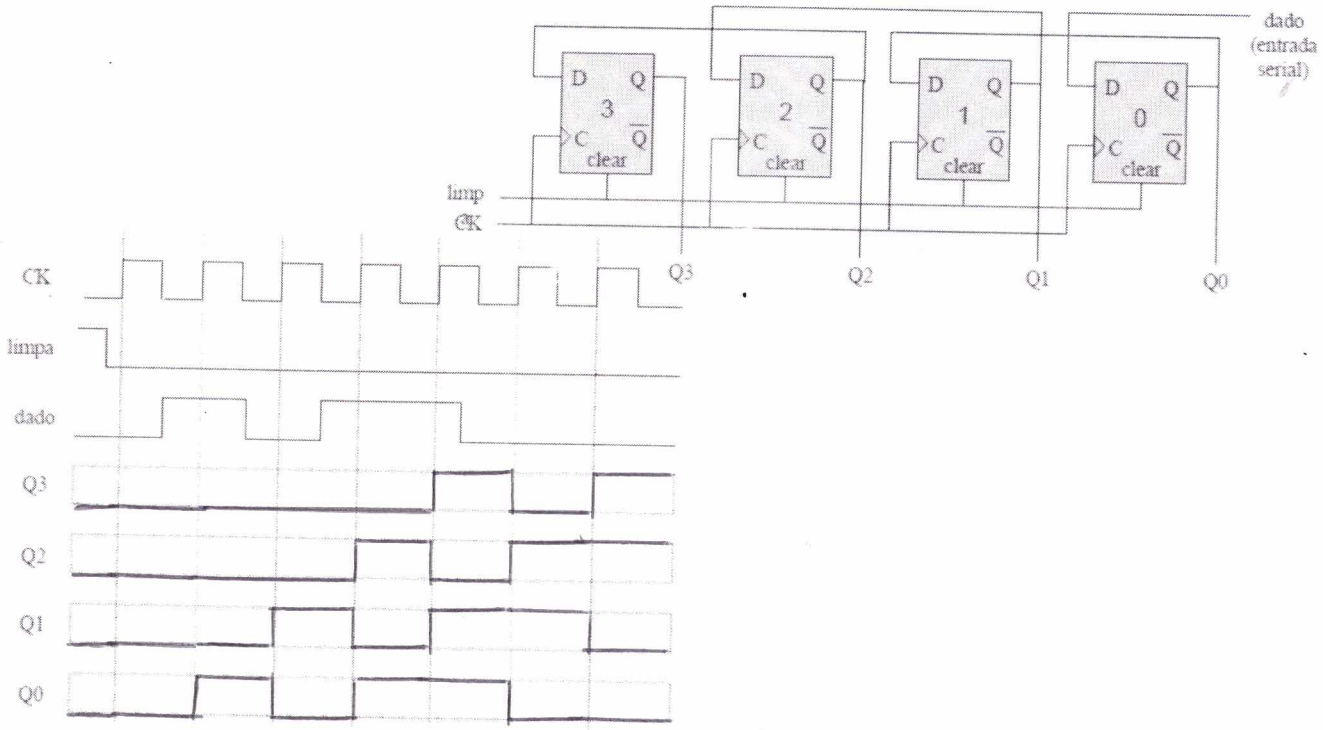
Latches, Flip-Flops e Registradores

Registrador de deslocamento (à direita)



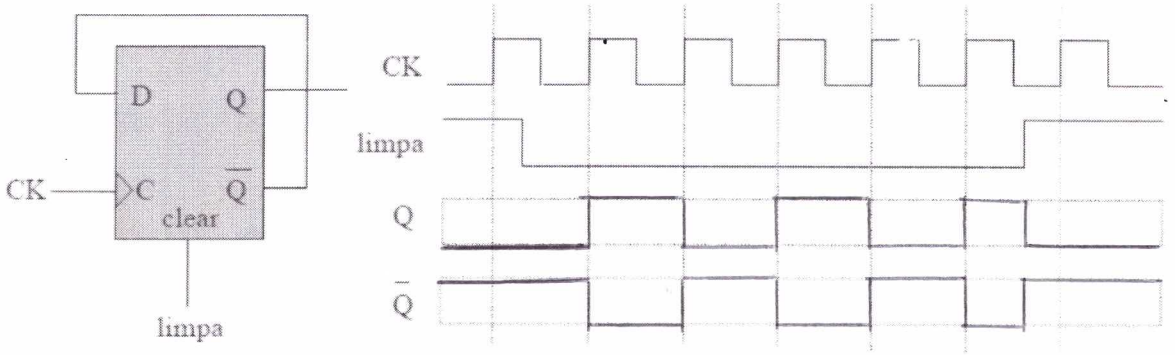
Latches, Flip-Flops e Registradores

Registrador de deslocamento (à esquerda)



Latches, Flip-Flops e Registradores

Registrador contador (1 bit)



Latches, Flip-Flops e Registradores

Registrador contador (3 bits)