BLG231E

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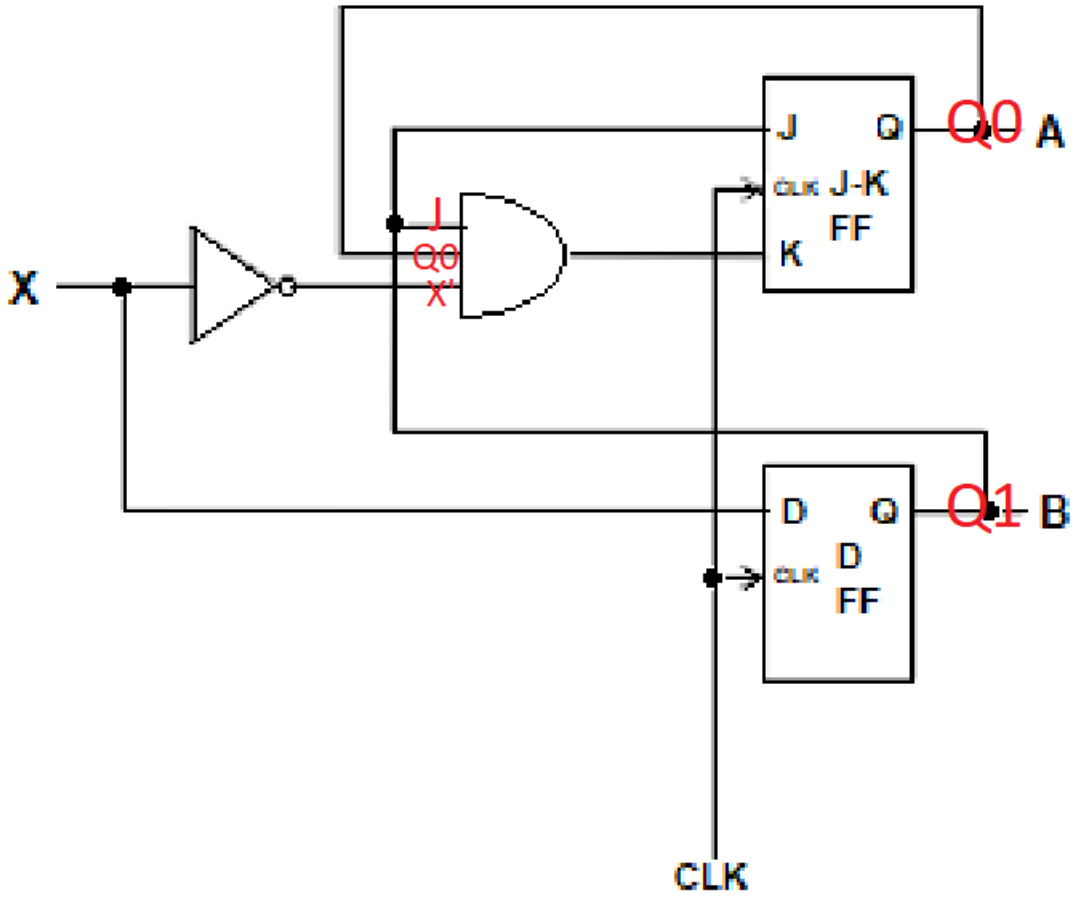
HW5



a) For next state equations,

a. Determine the expression for the F function that drives the flip-flops F(S,I):

J = Q1

K = J.Q0.X’

D = X

b. Determine the next state S+={Q0(t+), Q1(t+)} expressions. S+= H(S,I):

$Q0^{+}$ = J.(Q0)’ + K’.Q0

$Q1^+ = D$

Substitute proper terms:

$Q0^+ = Q1.(Q0)' + (Q1.Q0.X')'.Q0$

$= Q1.(Q0)' + (Q1)'.Q0 + X.Q0$ (De Morgan and Distributivity)

$Q1^+ = X$

c. Determine the expression of the output function:

Z0 = A = Q0

Z1 = B = Q1

b) For constructing the state/output table:

$Q1^+Q0^+$

X / Q1Q0	0	1	Z1	Z0
00	00	10	0	0
01	01	11	0	1
10	01	11	1	0
11	00	11	1	1

<=>

S^+

X / S	0	1	Z1	Z0
A	A	C	0	0
B	B	D	0	1
C	B	D	1	0
D	A	D	1	1

c) State diagram: