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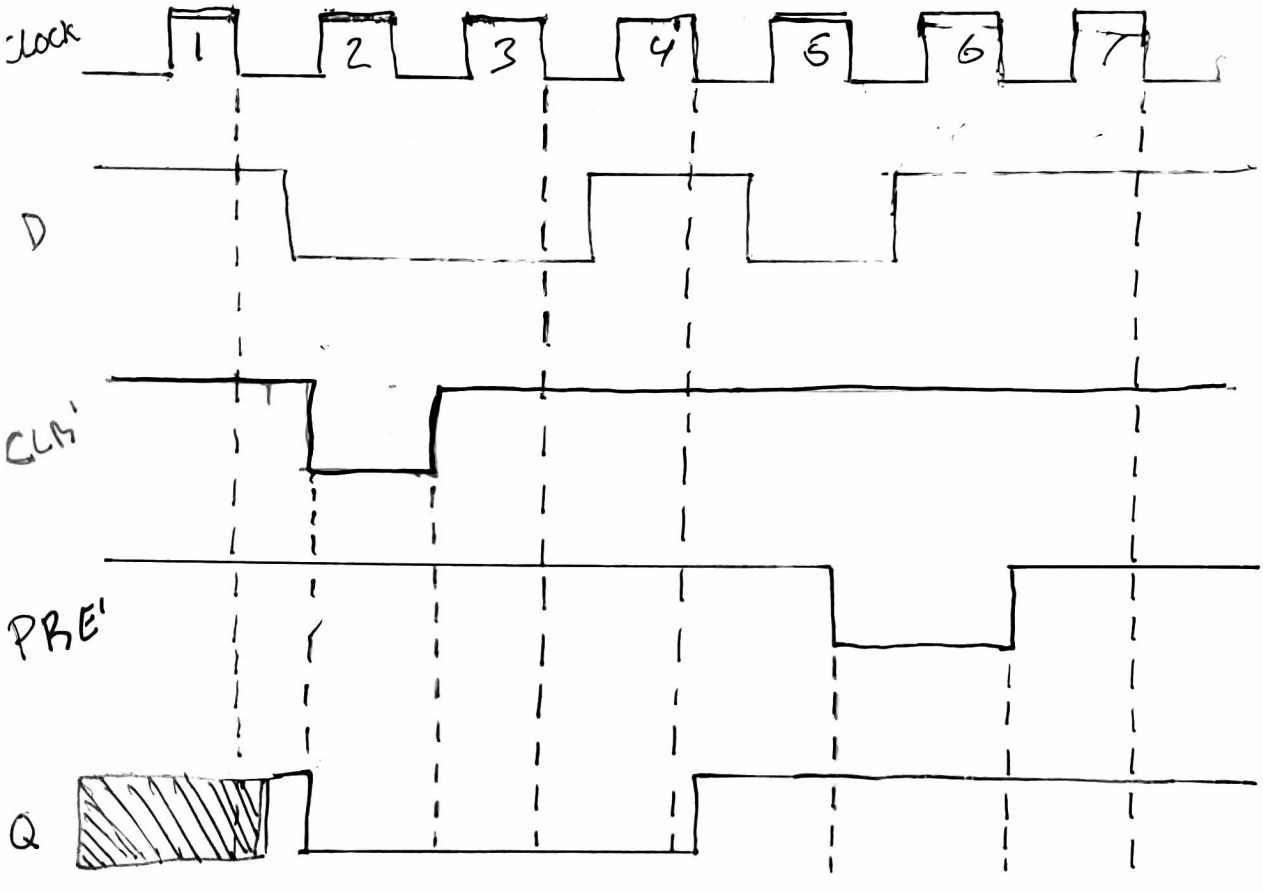
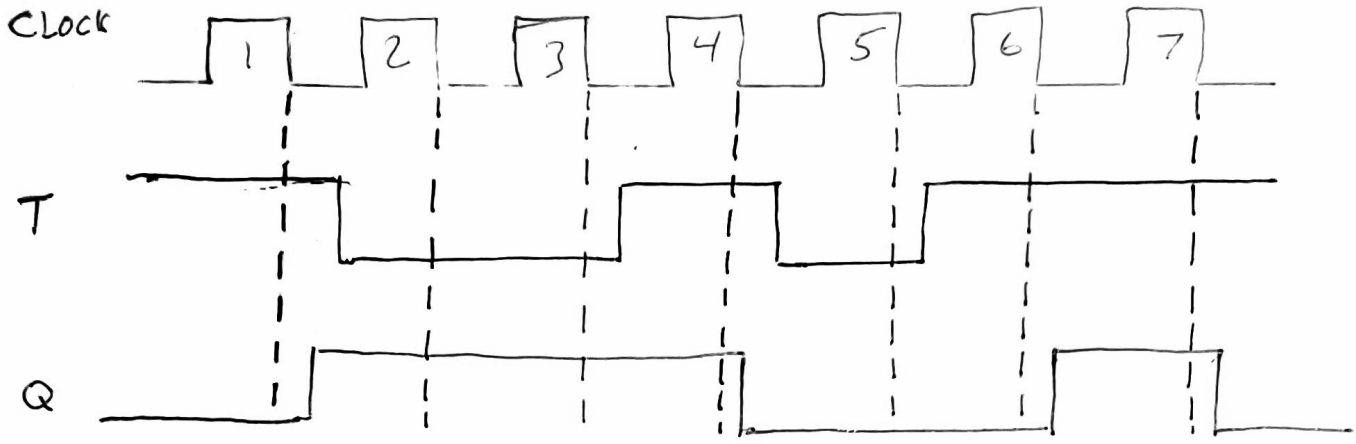
Homework #5

Chapter 6, problem 3c, d, e: FOR the input shown below, show the flip flop outputs.

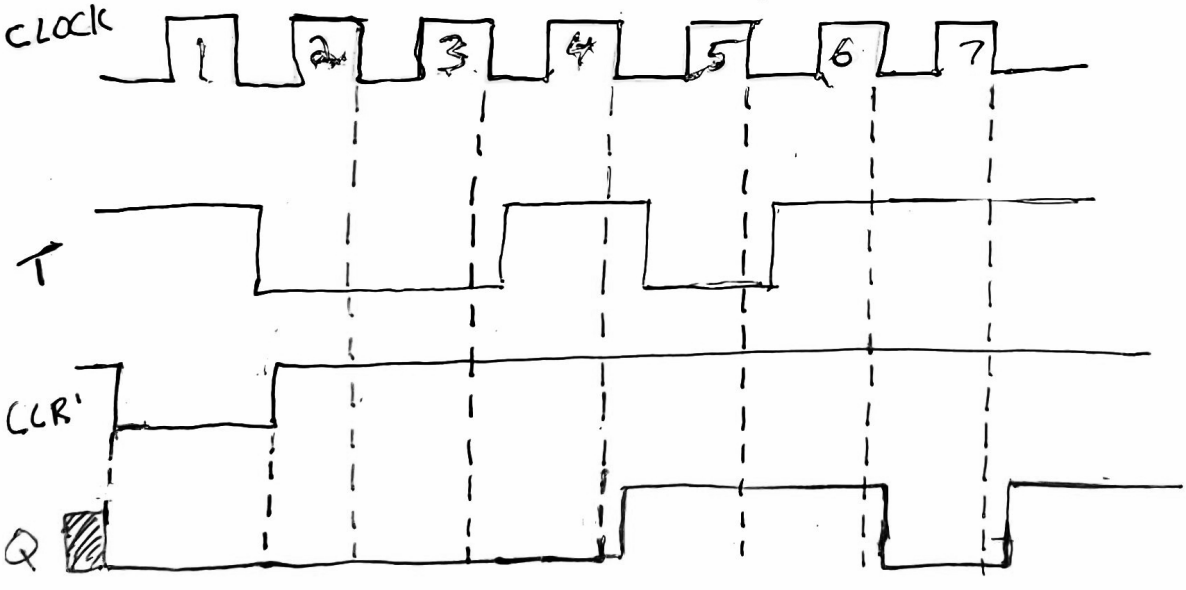
(C.) Assume that the flip flop is a D flip flop with active low clear.



(d) Assume that the flip flop is a T flip flop with the same input as part a, and that Q is initially 0.

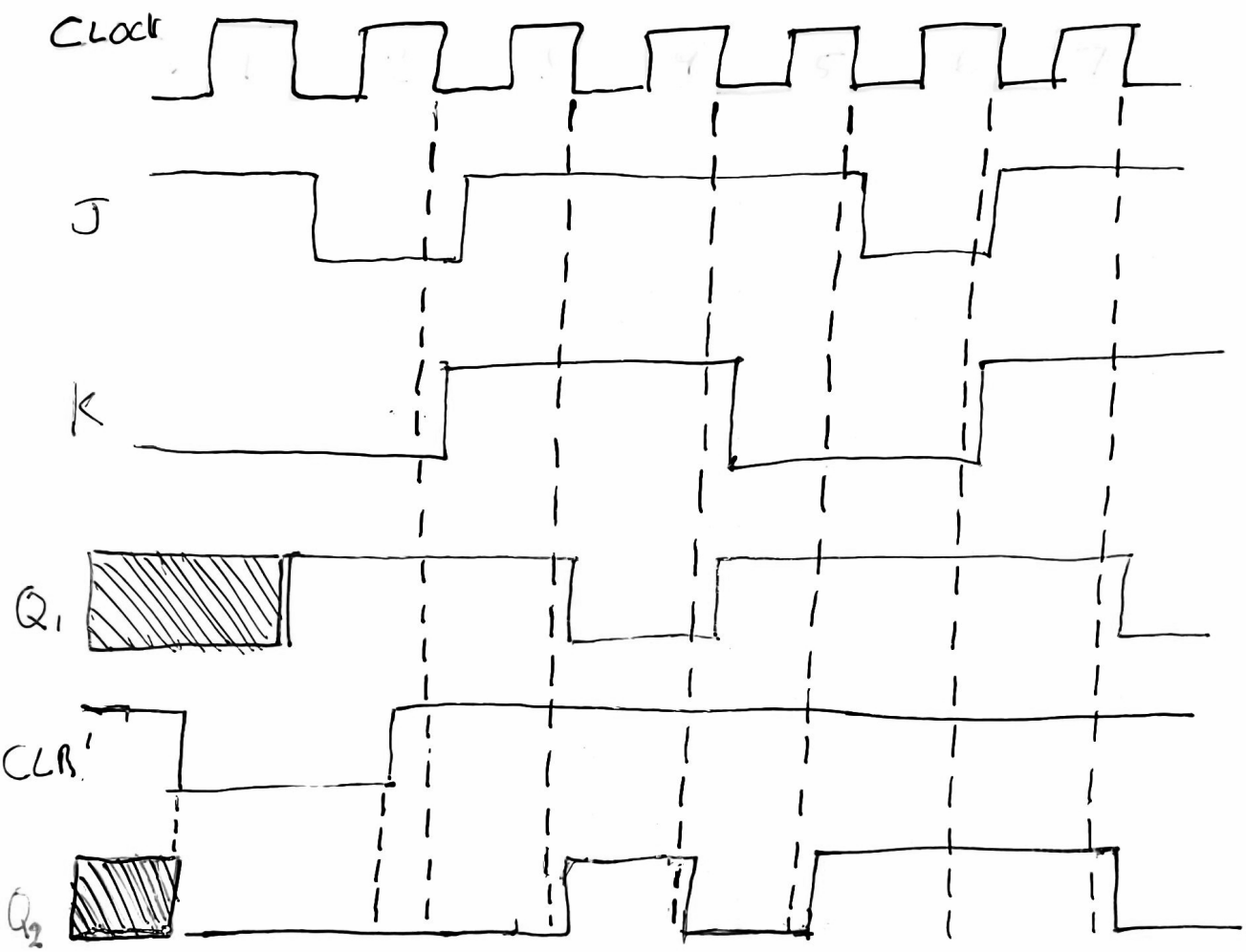


(e) Assume that the flip flop is a T flip flop with an active low clear and the same input as par b.

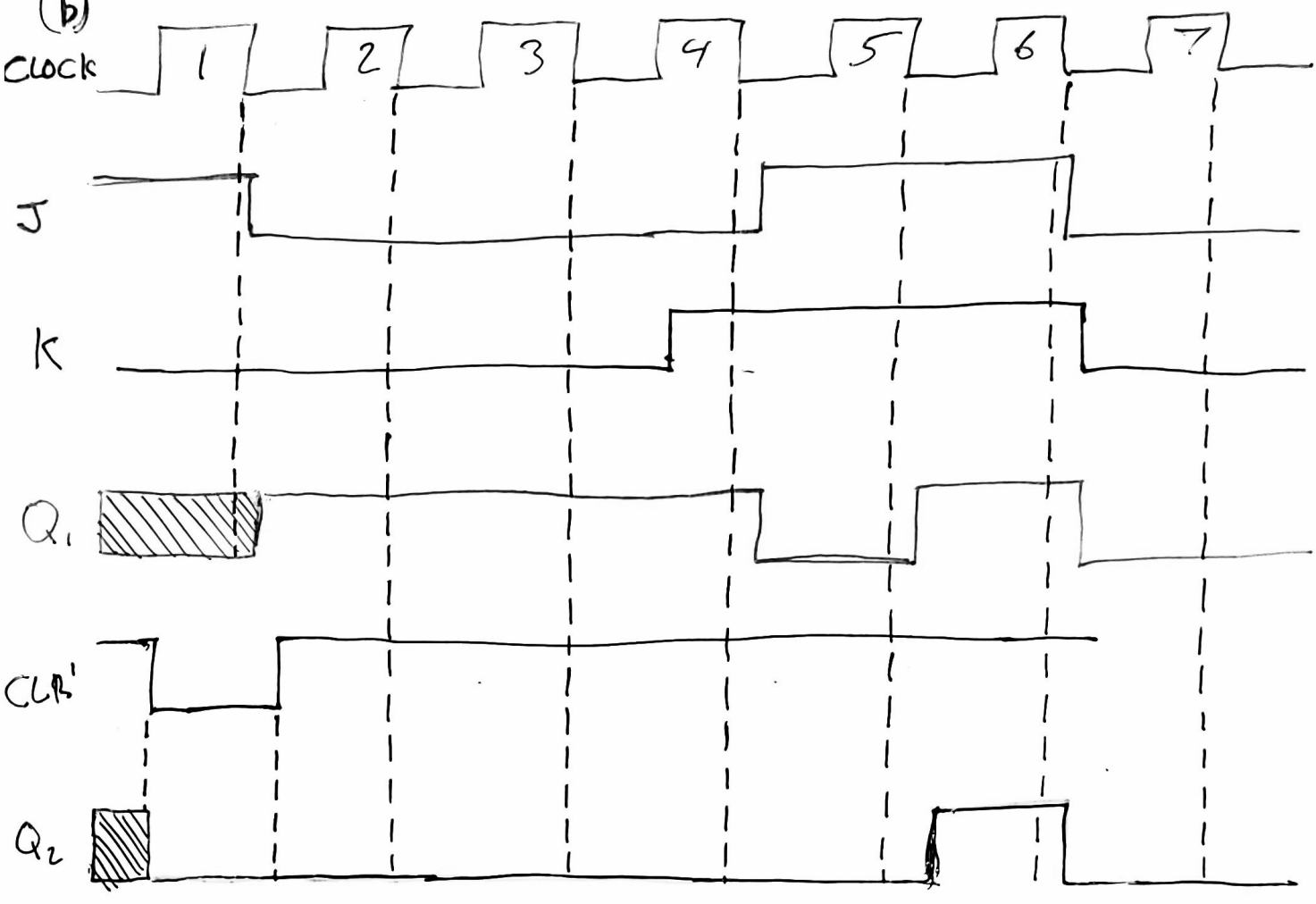


Chapter 6, problem 4: For a negative-edge triggered JK flip flop with active-low Preset and Clear inputs (74112), complete each individual timing diagram with the output Q.

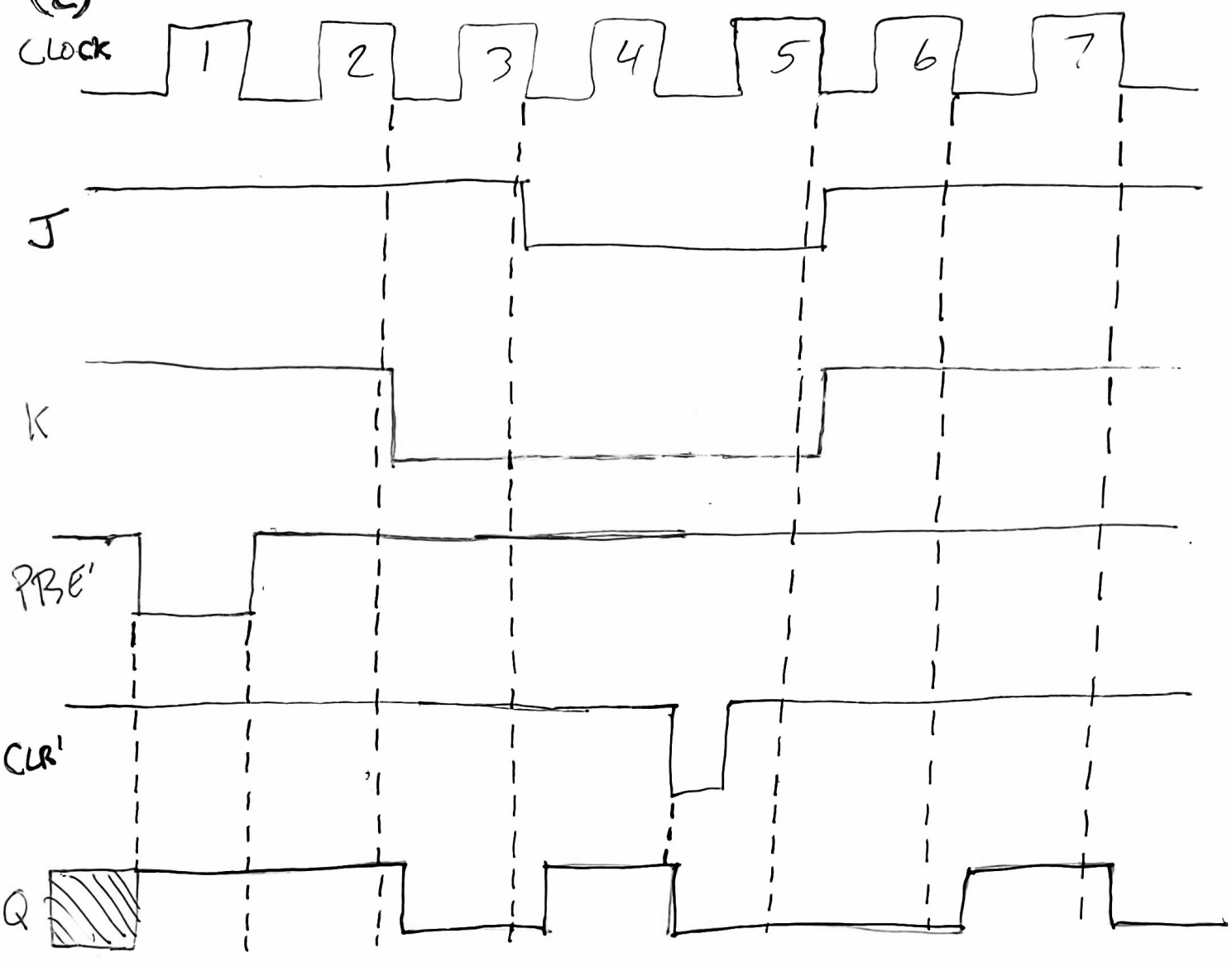
(a)



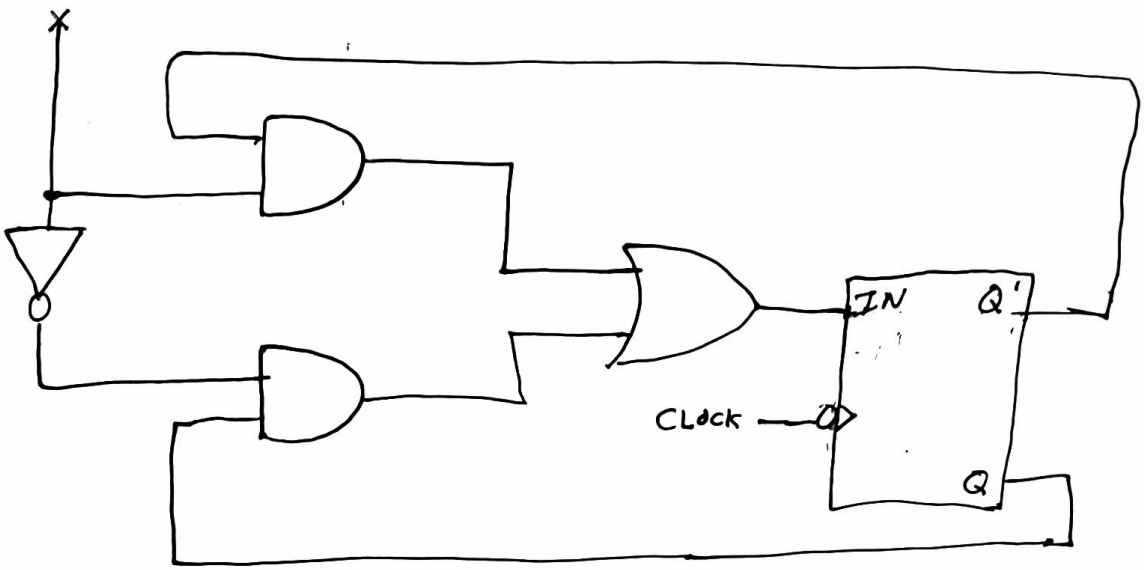
(b)



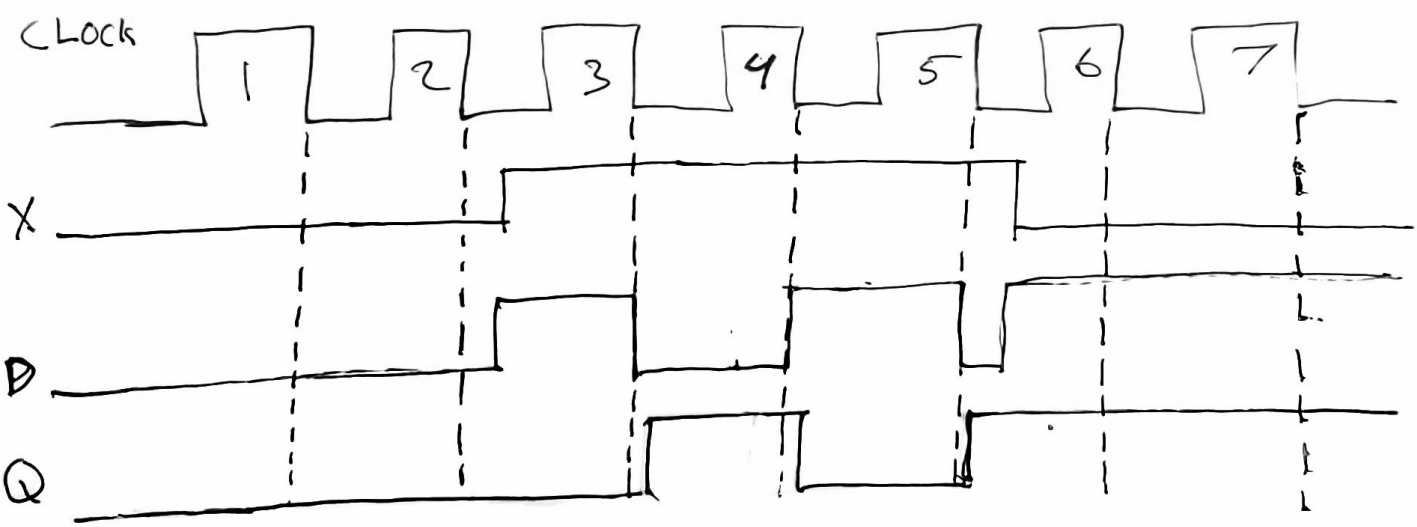
(c)



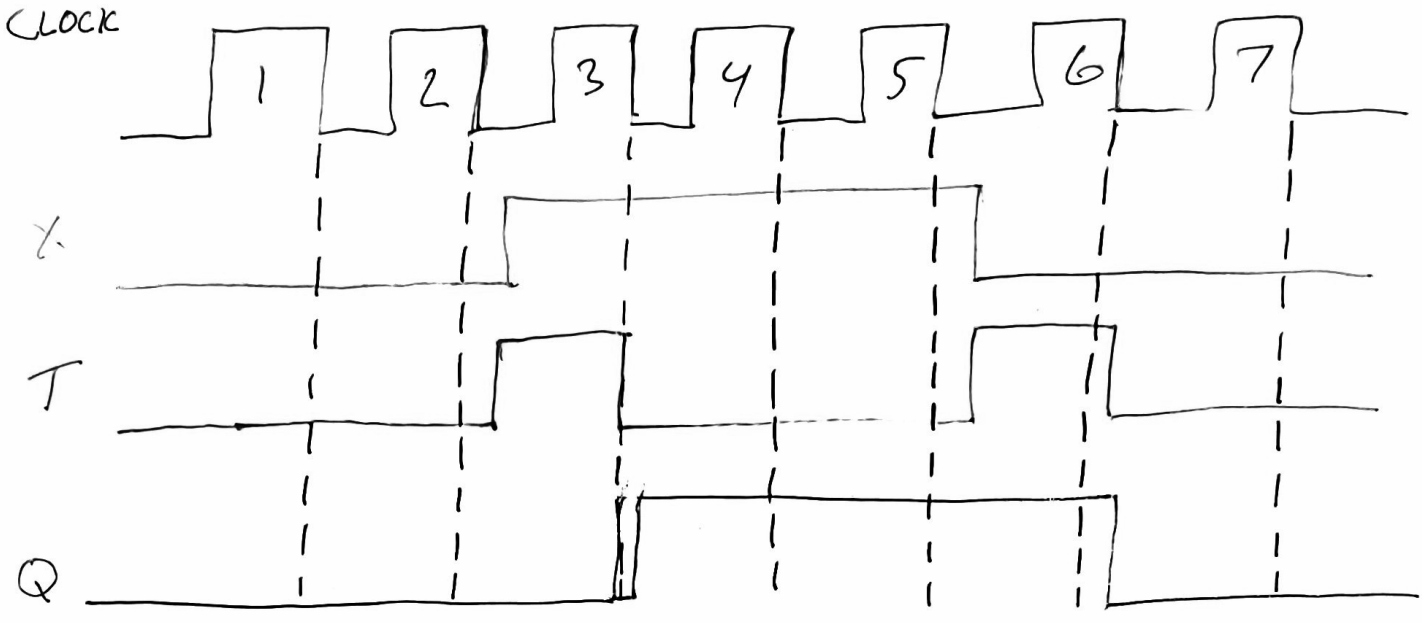
Chapter 6, problem 5: Considering the following circuit, complete the timing diagram if the flip flop is:



(a) a D flip flop (assume Q = 0 initially)

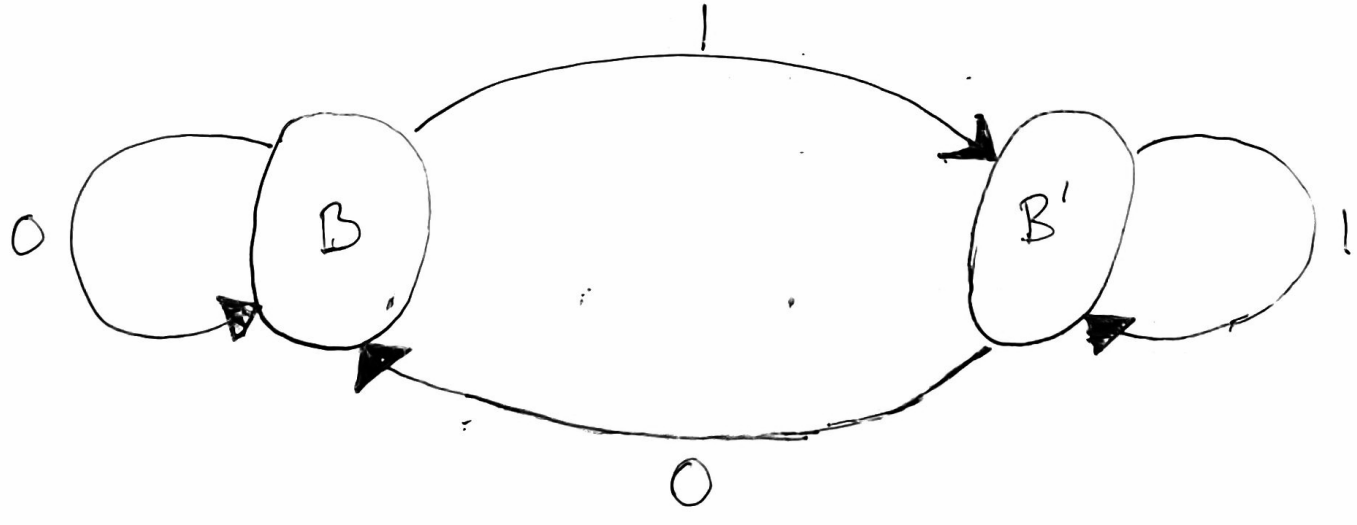


(b) A T flip flop (Assume Q = 0 Initially)



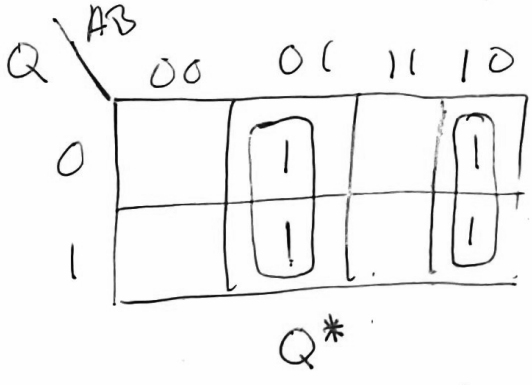
Chapter 6 problem 6: We have a new type of flip flop with inputs A and B. If A = 0, the $Q^* = B$; If A = 1, $Q^* = B'$

(a) Show A diagram for this flip flop



(b) Write an equation for Q^* in terms of A, B and Q.

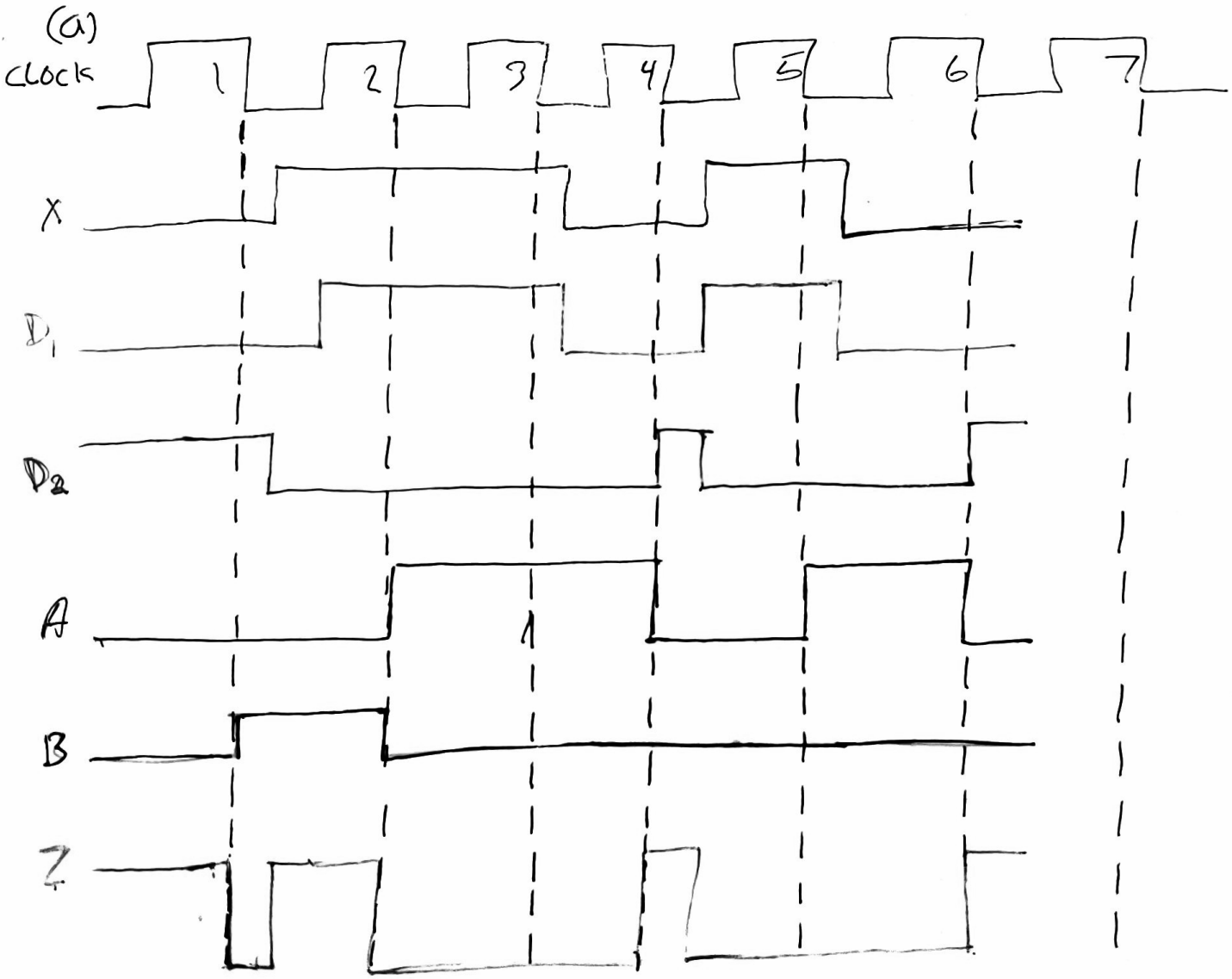
A	B	Q	Q'
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0



Q^*

Equation: $Q^* = A'B + AB'$

Chapter 6, problem 7: For each of the following circuits, complete the timing diagram for the state of each flip flop and the output, where shown. All flip flops are trailing-edge triggered. For those circuits in which there is no clear input, assume each flipflop starts at 0.

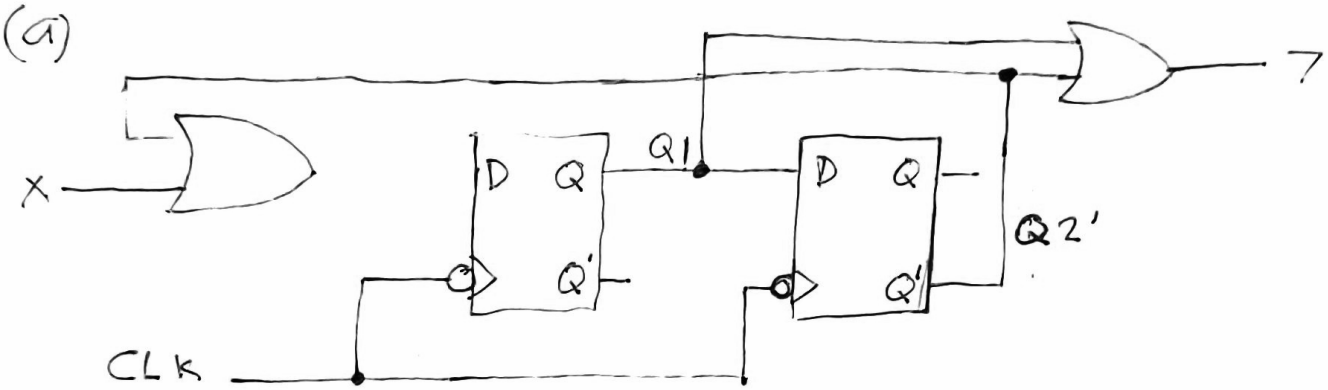


Chapter 6, problem 8: For the following circuit and input string:

(i) Construct a state table (calling the states 00, 01, 10, 11)

(ii) Show a timing trace for the flip-flops and the output as far as possible. Assume that the initial value of each flip flop is 0.

(a)



X 0011001110

(i) State Table:

$q_1 q_2$	$q_1^* q_2^*$ x=0	x=1	Z
00	10	10	1
01	00	10	0
11	11	11	1
10	01	11	1

(ii) Timing Trace.

x	0	0	1	1	0	0	1	1	0				
q_1	0	1	1	1	1	0	0	1	1	0	?	1	?
q_2	0	0	1	1	1	1	0	0	1	1	0	?	1
z	1	1	1	1	1	0	1	1	1	0	1	1	?