

Name: _____

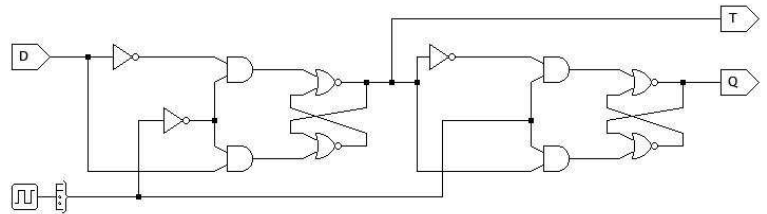
CIS 351 Sample SL2 Problem

06 September 2025

SL2: Flip-Flops

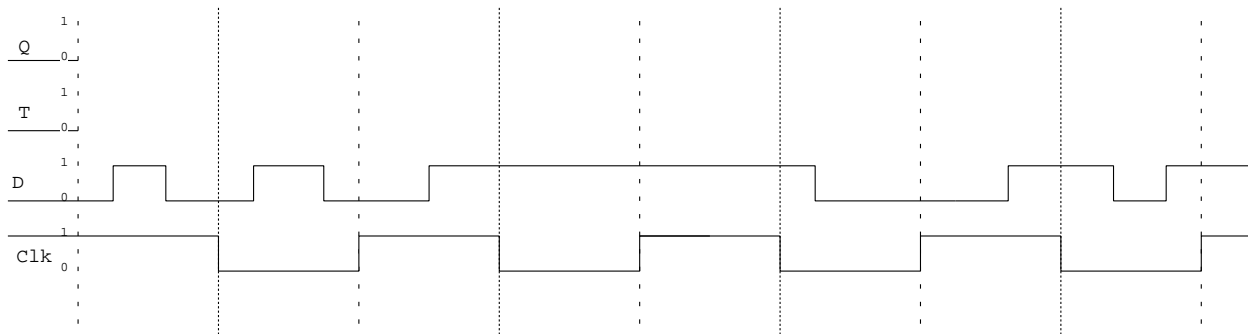
Consider the master-slave flip-flop shown to the right:

(a) Is this a rising-edge, or falling-edge flip-flop? How can you tell?



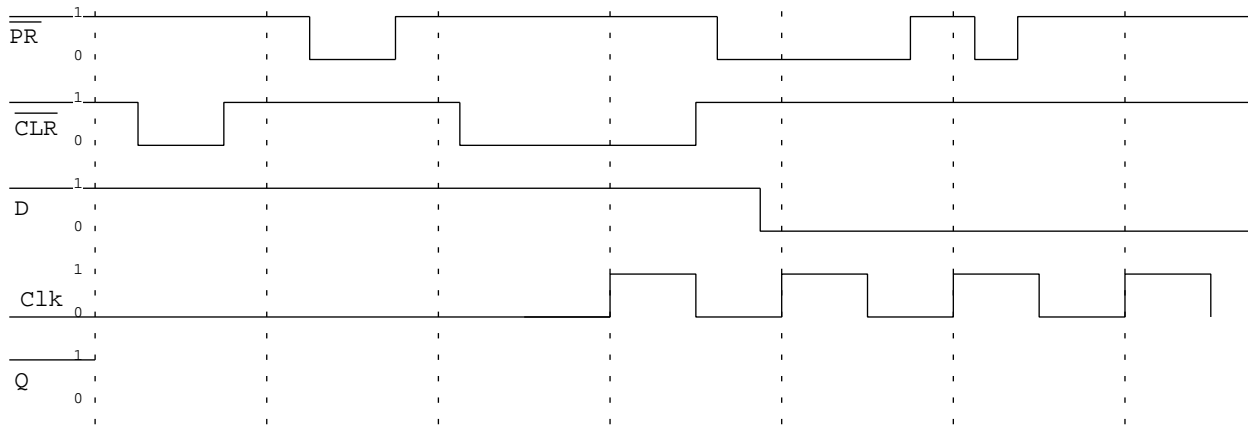
(b) Explain what gives this circuit its “instant trigger point.”

(c) Complete the timing diagram below that shows the *internal* operation of the master-slave flip-flop.



Name: _____

(d) Complete the timing diagram below that shows the *external* behavior of the master-slave flip-flop.



CIS 351 Sample SL2 Problem Solutions

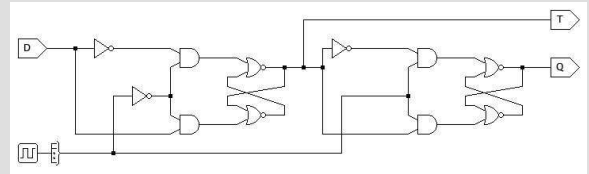
Fri 26th Sept, 2025

SL2: Flip-Flops

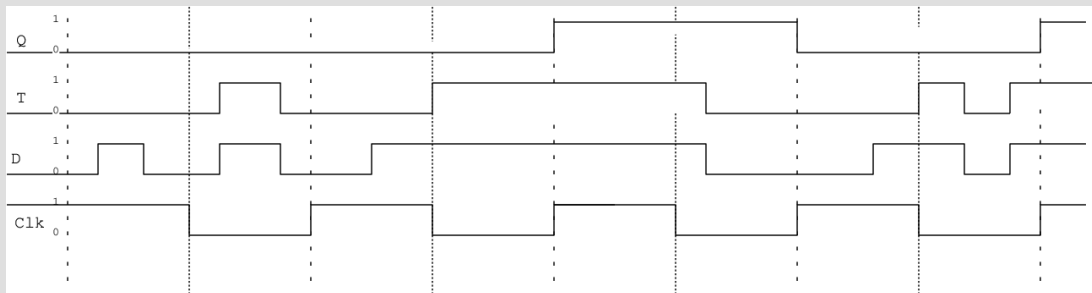
Consider the master-slave flip-flop shown to the right:

- (a) Is this a rising-edge, or falling-edge flip-flop? How can you tell?

It is a *rising-edge* triggered flip-flop. You can tell because the latch attached to the output Q changes values when the clock rises from 0 to 1. (From the perspective of the user, Q contains the current state of the flip-flop.)



- (b) Explain what gives this circuit its “instant trigger point.”
- (c) Complete the timing diagram below that shows the *internal* operation of the master-slave flip-flop.



- (d) Complete the timing diagram below that shows the *external* behavior of the master-slave flip-flop.

