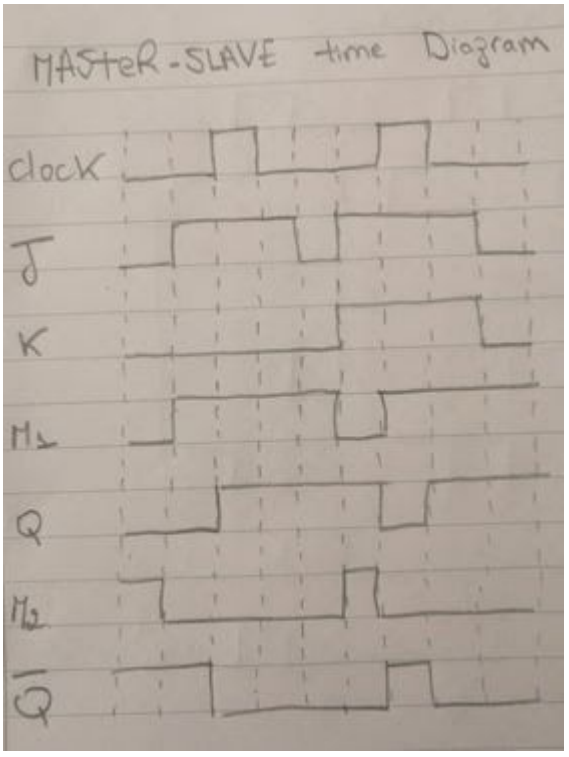
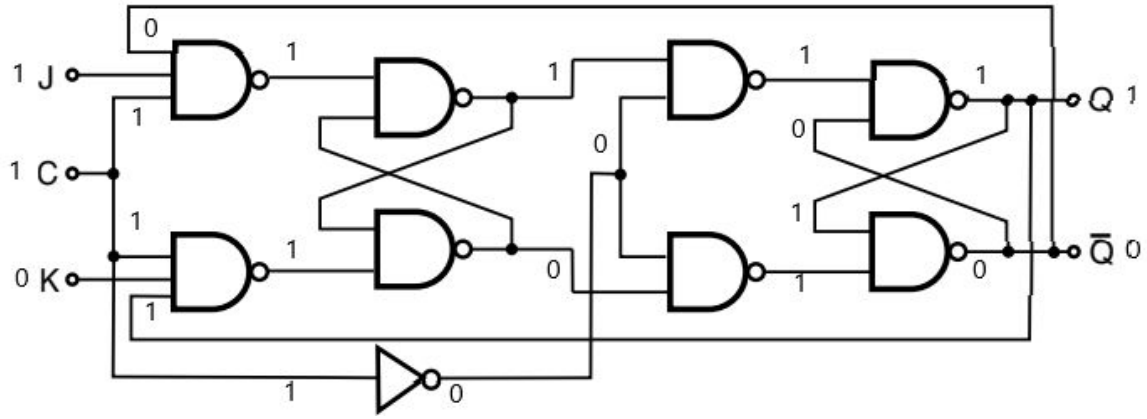
ICS 2020 Problem Sheet #9

Problem 9.1:

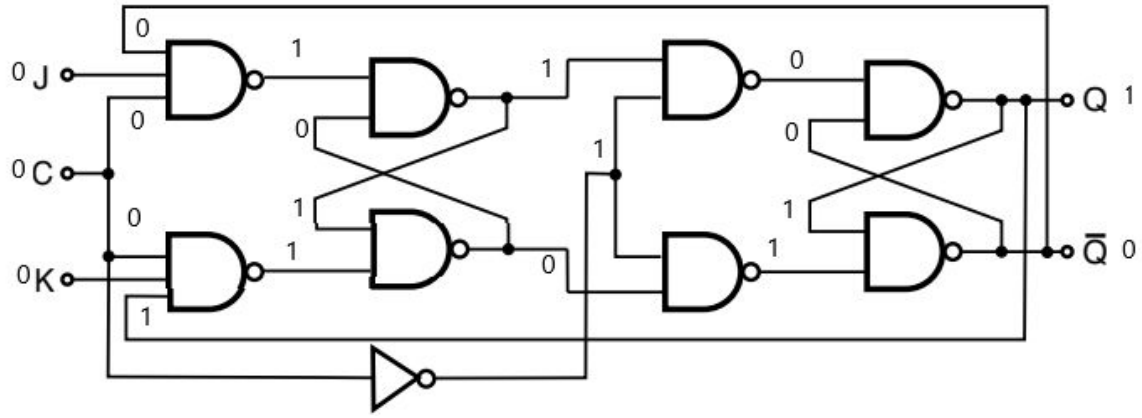
Time diagram:



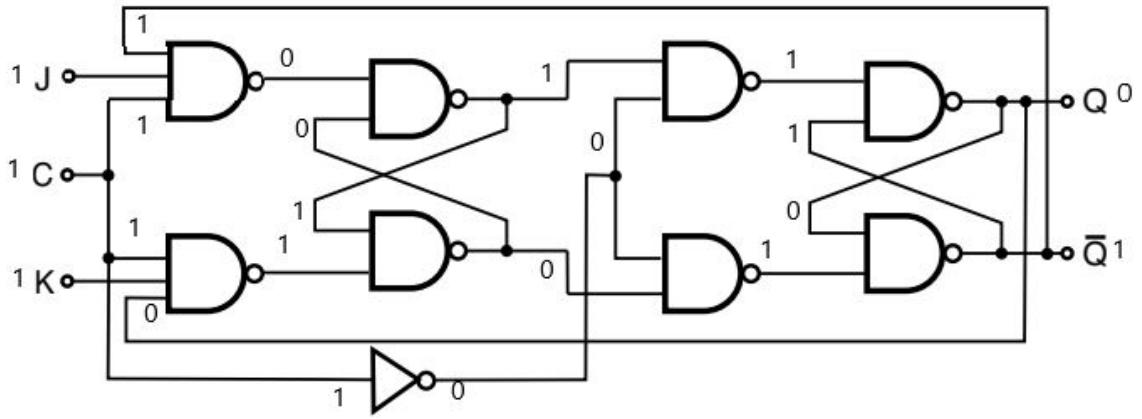
a)J transitions to 1 and C transitions to 1 soon after:



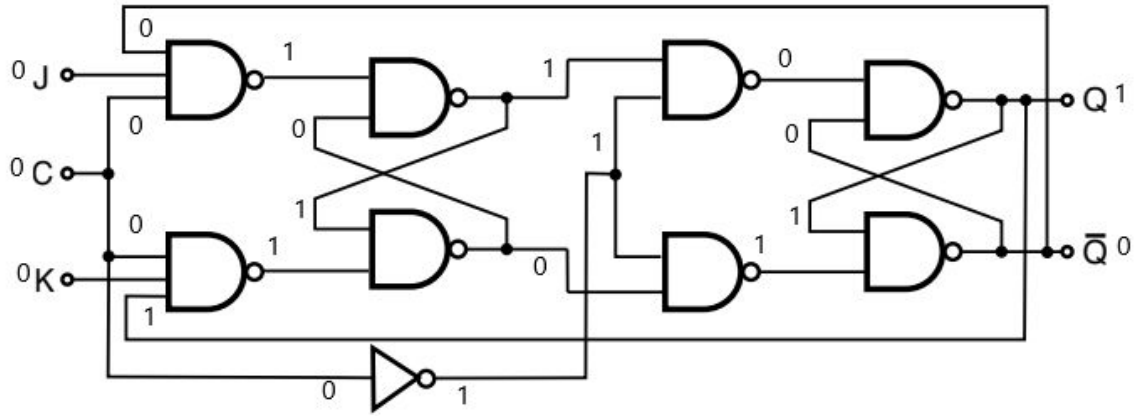
b)C transitions back to 0 and soon after J transitions to 0 as well:



c)J and K both transition to 1 and C transitions to 1 soon after:

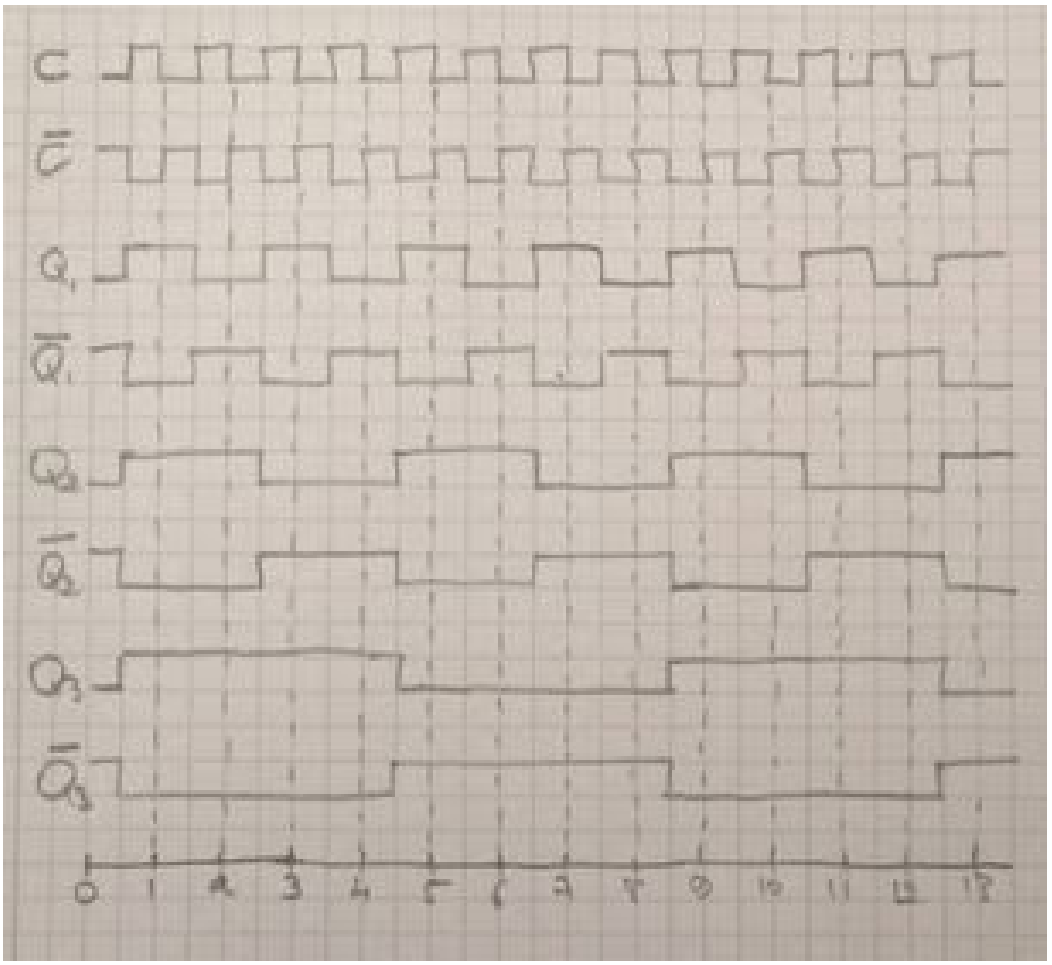


d)C transitions back to 0 and soon after J and K both transition to 0 as well:



Problem 9.2:

a)



b)you can make ripple counters arbitrary long since for:
q1's changing frequency is 2 x the clock input's frequency,
q2's changing frequency is 2^2 x the clock input's changing frequency,
qn's changing frequency is 2^n x the clock input's changing frequency, with n the number of positive edge triggered D flip-flops.