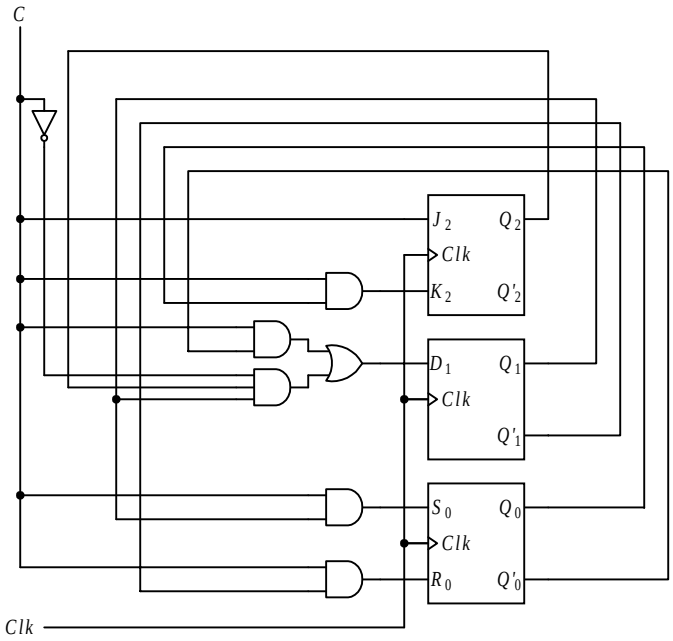
UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Computer Science and Engineering
Department of Electrical Engineering
CS/EE120B – Introduction to Embedded Systems
Homework 1
Given April 9, 2001, Due April 18, 2001

15

1. Derive the next-state/output table and state diagram for the following circuit. (5)



2. Synthesize a circuit that will count the following sequence using only <u>one</u> type of flip-flops:

   1, 4, 6, 7, 1, 4, 6, 7, ….

   The count is to be represented directly by the contents of the flip-flops. The counter is enabled by the input *C*. The count stops when $C = 0$. Determine which type of flip-flop (D, SR, JK, or T) gives the smallest circuit. You only need to draw the circuit using the flip-flops that gives the smallest circuit. Assume that the circuit size is proportional to the number of 2-input gates and inverters needed in the next-state function. (10)