(28) $R_0 \leftarrow R_1$ $R_8 \leftarrow R_3$

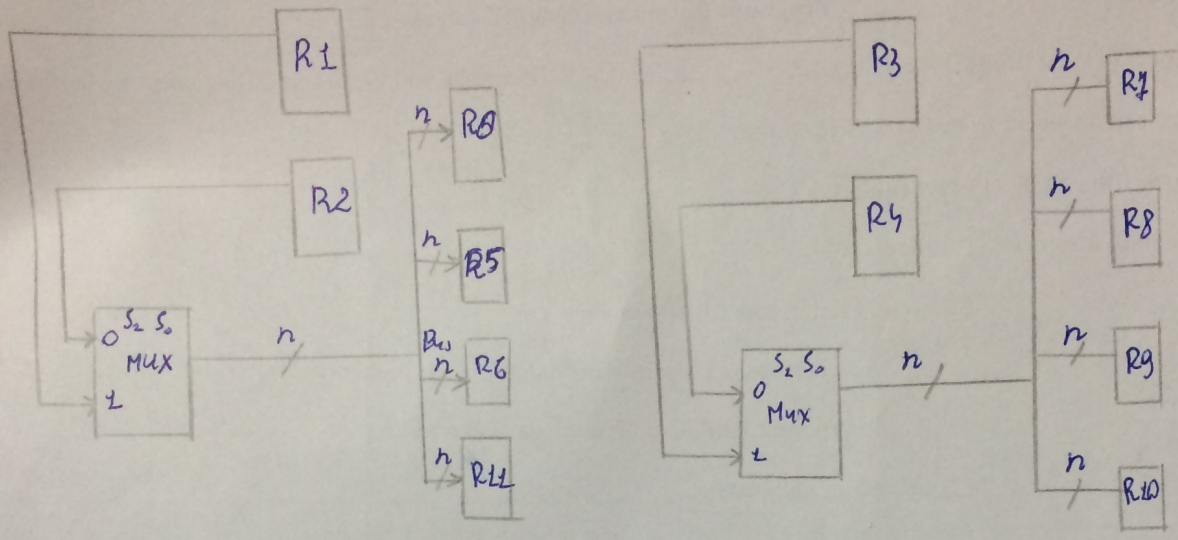
$R_5 \leftarrow R_1$ $R_9 \leftarrow R_4$

$R_6 \leftarrow R2$ $R_{10} \leftarrow R_4$

$R_7 \leftarrow R_3$ $R_{11} \leftarrow R_1$

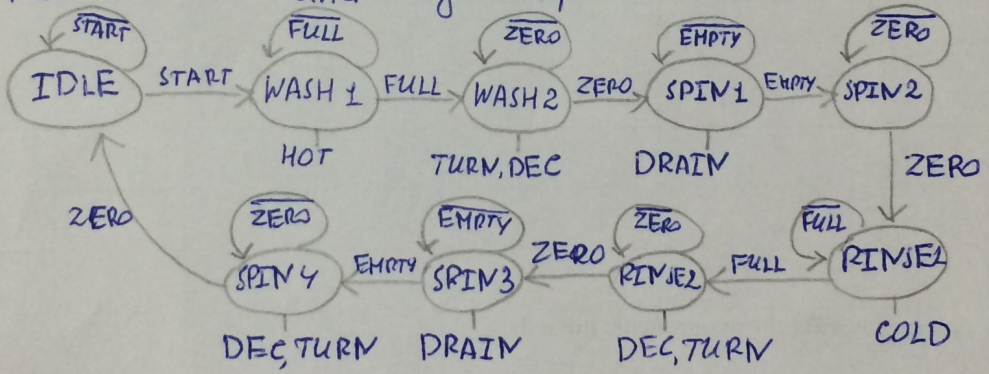
a) At most 2 clock cycles
2 buses

b)



(37) State machine: clock CK
3 external inputs: START, FULL, EMPTY
External outputs: HOT, COLD, DRAIN, TURN
Datapath for the control: downcounter which has 3 inputs RESET, DEC and LOAD and single output: ZERO

a)



b) 2 more inputs: PAUSE and STOP

~~Two more states~~ For PAUSE add a FLIP-FLOP set by START and reset by PAUSE. OR flip-flop complemented with each input in the loop and AND it with each input on transition.

For STOP a new state: $\overline{STOP}$ is ANDED with all input conditions. Each state transists to state STOP if STOP is 1.