* Question 3

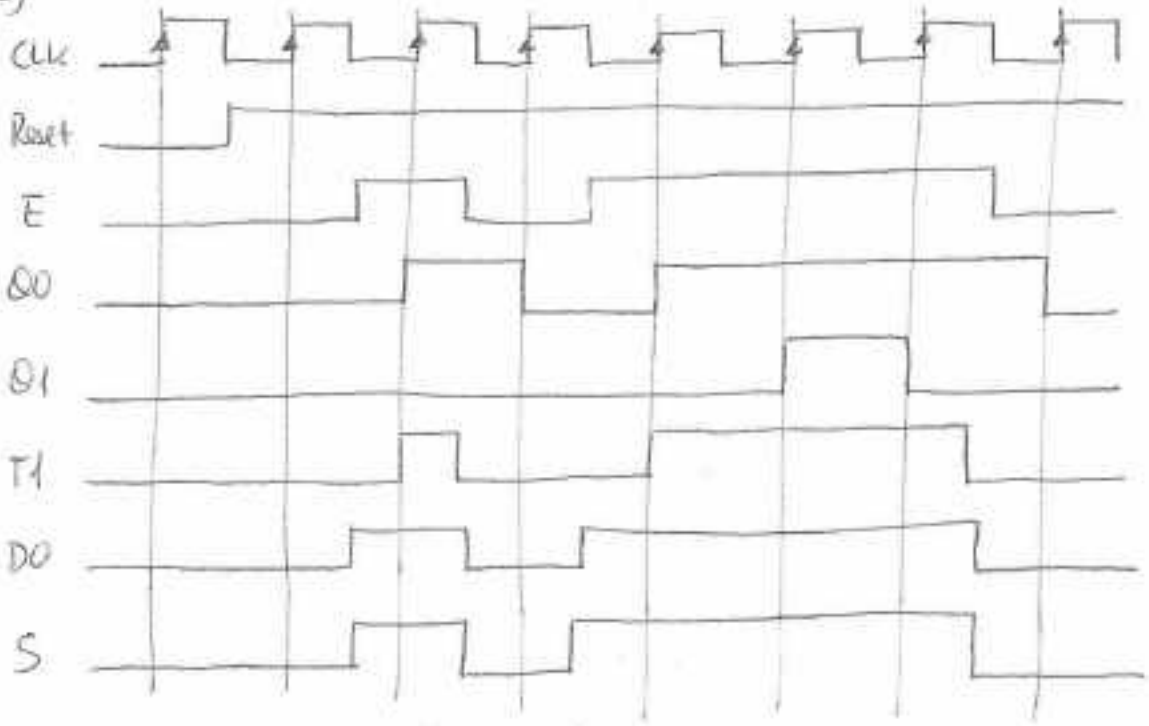
a) It is a Mealy circuit because the output depends on the input and the state.

b) Output function: $S = E + Q_1$

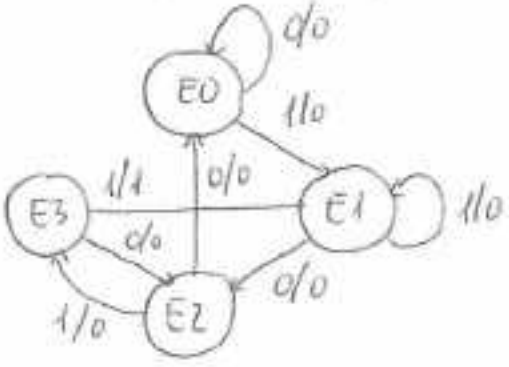
State function: $D0 = E$

$T1 = E \cdot Q_0$

c)



* Question 4



a) There are 1 input and 1 output, for example, X for the input and Y for the output

b) There are 4 states (E0, E1, E2, E3) and the number of flip-flops must fulfill the next expression: $2^n \geq N$ | N = number of states, n = number of flip-flops | $N=4 \Rightarrow n=2$: You need 2 flip-flops.

For the state encoding, considering the requirement of the annunciator, the only solution is:

State	Q_0	Q_1	
E0	0	0	= 0 in binary
E1	0	1	= 1 in binary
E2	1	0	= 2 in binary
E3	1	1	= 3 in binary