c) Transition table: Looking at the ST6 and knowing the transition table of a D-flip-flop

Q_0	Q_1	X	Q_0'	Q_1'	D_0	D_1	Y
0	0	0	0	0	0	0	0
0	0	1	0	1	0	1	0
0	1	0	1	0	1	0	0
0	1	1	0	1	0	1	0
1	0	0	0	0	0	0	0
1	0	1	1	1	1	1	0
1	1	0	1	0	1	0	0
1	1	1	0	1	0	1	1
			from the ST6		from the transition table of a D flip-flop		from the ST6

D	Q'
0	0
1	1

d)

→ The state functions are the next ones: $D_0 = \bar{Q}_0 Q_1 \bar{X} + Q_0 \bar{Q}_1 X + Q_0 Q_1 \bar{X}$

$D_1 = \bar{Q}_0 \bar{Q}_1 X + \bar{Q}_0 Q_1 X + Q_0 \bar{Q}_1 X + Q_0 Q_1 X$

→ The output function is the next one: $Y = Q_0 Q_1 X$

* The reduction for D_0 is:

X \ Q_0Q_1	00	01	11	10
0		1	1	
1				1

$\bar{X} Q_1$

$\Rightarrow D_0 = Q_1 \bar{X} + Q_0 \bar{Q}_1 X$

* The reduction for D_1 is:

X \ Q_0Q_1	00	01	11	10
0				
1	1	1	1	1 → X

$\Rightarrow D_1 = X$

* There is no reduction for the output function, so: $Y = Q_0 Q_1 X$