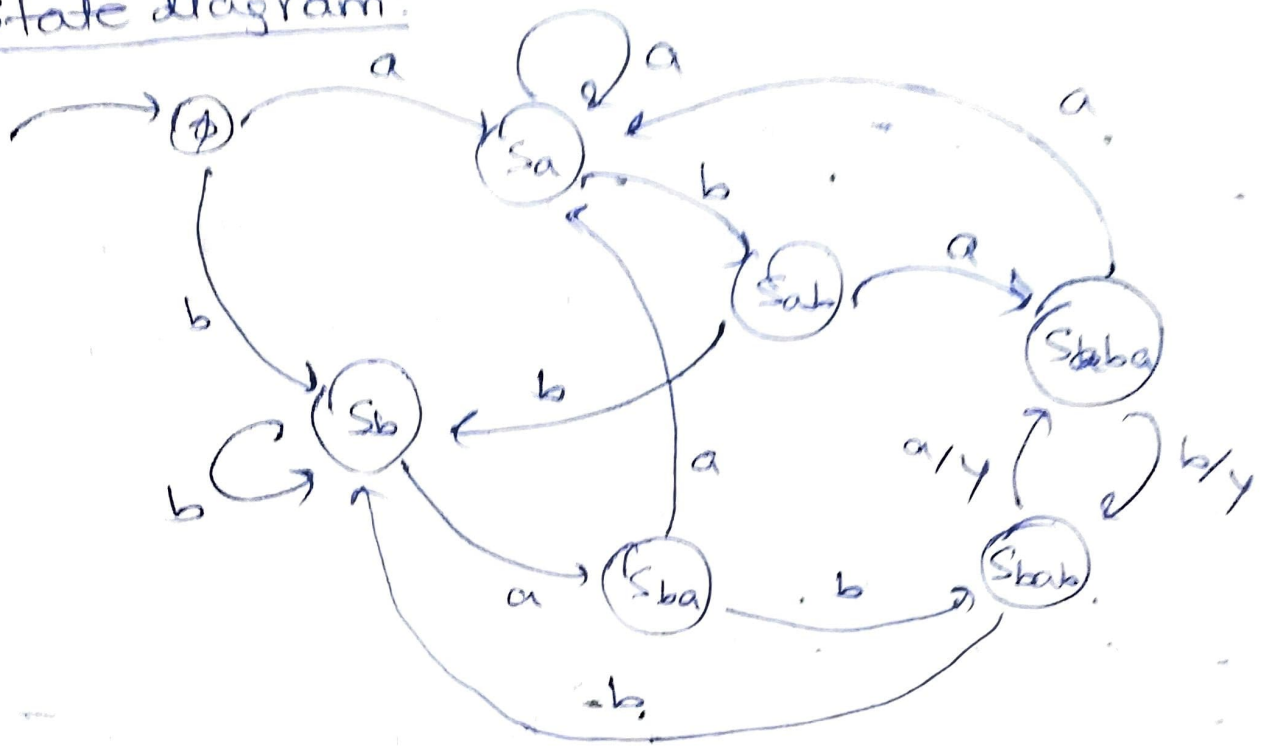
EE216

State diagram:



- Truth Table:

	Inputs w_1	Inputs w_0	Current states q_2	Current states q_1	Current states q_0	State	Next states q_2'	Next states q_1'	Next states q_0'		Y
1)	1	X	X	X	X	X	0	0	0	ϕ	
2)	0	0	0	0	0	~~ϕ~~	0	0	1	S_a	0
3)	0	0	0	0	1	~~ϕ~~ S_a	0	1	~~0~~		0
4)	0	1	0	0	0	ϕ	0	1	0	S_b	0
5)	0	1	0	1	0	S_b	0	1	0	S_b	0
6)	0	1	0	0	1	S_a	0	1	1	S_{ab}	1
7)	0	1	0	1	1	S_{ab}	0	1	0	S_b	0
8)	0	0	0	1	0	S_b	1	0	0	S_{ba}	0
9)	0	0	1	0	0	S_{ba}	0	0	1	S_a	0
10)	0	0	0	1	1	S_{ab}	1	0	1	$S_{~~bab~~ abs}$	0
11)	0	0	1	0	1	S_{aba}	0	0	1	S_a	0
12)	0	1	1	0	0	S_{ba}	1	1	0	S_{bab}	0
13)	0	1	1	1	0	S_{bab}	0	1	0	S_b	0
14)	0	1	1	0	1	S_{aba}	1	1	0	$S_{~~bab~~}$	1
15)	0	0	1	1	0	S_{bab}	1	0	1	S_{aba}	1

KMAP 1 q_2'

$w_0 q_2$ \ $q_1 q_0$	00	01	11	10
00	0	0	1	1
01	0	0	1	1
11	1	1	0	0
10	0	0	0	0

KMAP 2 q_1'

$w_0 q_2$ \ $q_1 q_0$	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	1	1	1	1
10	1	1	1	1

$$q_2' = (\bar{w}_0 q_1 + w_0 q_2 \bar{q}_1)\bar{w}_1 \qquad q_1' = w_0 \bar{w}_1$$

KMAP 3 q_0'

$w_0 q_2$ \ $q_1 q_0$	00	01	11	10
00	1	1	1	0
01	1	1	1	1
11	0	0	0	0
10	0	1	0	0

KMAP 4 Y

$w_0 q_2$ \ $q_1 q_0$	00	01	11	10
00	0	0	0	0
01	0	0	1	1
11	0	1	0	0
10	0	0	0	0

$$q_0' = (\bar{w}_0 q_2 + \bar{w}_0 \bar{q}_1 + \bar{w}_0 q_0 + \bar{q}_2 \bar{q}_1 q_0)\bar{w}_1$$

$$Y = (q_2 q_1 q_0 + \bar{w}_0 q_2 q_1 + w_0 q_2 q_0)\bar{w}_1$$