

DESIGN OF SYNCHRONOUS SEQUENTIAL CIRCUITS(with unused states)

92

State Table with Unused States

Present State			Input	Next State			Output
A	B	C		A	B	C	
0	0	1	0	0	0	1	0
0	0	1	1	0	1	0	0
0	1	0	0	0	1	1	0
0	1	0	1	1	0	0	0
0	1	1	0	0	0	1	0
0	1	1	1	1	0	0	0
1	0	0	0	1	0	1	0
1	0	0	1	1	0	0	1
1	0	1	0	0	0	1	0
1	0	1	1	1	0	0	1

SR Flip-Flop

Q(t)	Q(t+1)	S	R
0	0	0	X
0	1	1	0
1	0	0	1
1	1	X	0

State Table with Unused States

Present State			Input	Next State			Flip-Flop Inputs						Output
A	B	C		A	B	C	SA	RA	SB	RB	SC	RC	
m ₂	0	0	1	0	0	1	0	X	0	X	X	0	0
m ₃	0	0	1	1	0	1	0	X	1	0	0	1	0
m ₄	0	1	0	0	1	1	0	X	X	0	1	0	0
	0	1	0	1	1	0	1	0	0	1	0	X	0
	0	1	1	0	0	1	0	X	0	1	X	0	0
	0	1	1	1	1	0	1	0	0	1	0	1	0
	1	0	0	0	1	0	1	0	0	X	1	0	0
	1	0	0	1	1	0	0	0	X	0	0	X	1
	1	0	1	0	0	1	0	1	0	X	X	0	0
m ₁₁	1	0	1	1	1	0	0	0	0	X	0	1	1
For each of minterm 0, 1, 12, 13, 14, 15							X	X	X	X	X	X	X

For each of minterm 0, 1, 12, 13, 14, 15

	AB	00	01	11	10
A	00	X	X		
	01		1	1	
	11	X	X	X	X
	10	X	X	X	

SA = Bx

X	X	X	X
X			X
X	X	X	X
			1

RA = Cx'

X	X	1	
X			
X	X	X	X

SB = A'B'x

X	X		X
	1	1	1
X	X	X	X
X	X	X	X

RB = BC + Bx

X	X		X
1			X
X	X	X	X
1			X

SC = x'

X	X	1	
	X	1	
X	X	X	X
	X	1	

RC = x

X	X		
X	X	X	X
	1	1	

Z = Ax