

'Assignment-04'

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Sec: 03-B

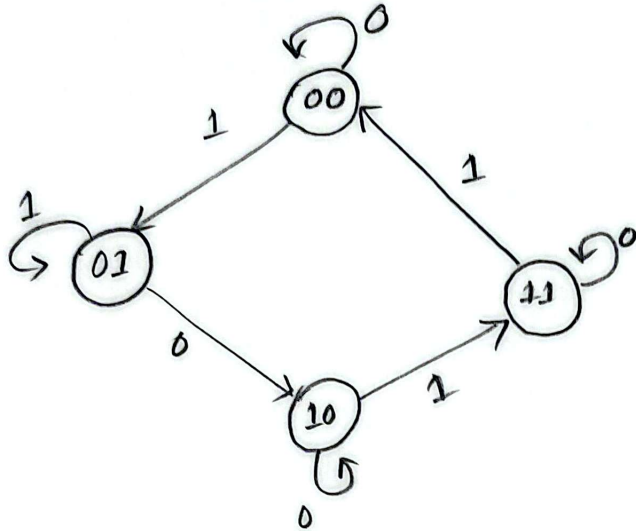
Course: CSE260

Semester: Fall'2025

Date : 04-01-2026

Ans. to the que. no-01

Given state Diagram,



SR-Flip Flop Excitation Table

Q	Q ⁺	S	R
0	0	0	X
0	1	1	0
1	0	0	1
1	1	X	0

Present state		Input	Next state		Flip Flop Inputs			
A	B	X	A ⁺	B ⁺	SA	RA	SB	RB
0	0	0	0	0	0	X	0	X
0	0	1	0	1	0	X	1	0
0	1	0	1	0	1	0	0	1
0	1	1	0	1	0	X	X	0
1	0	0	1	0	X	0	0	X
1	0	1	1	1	X	0	1	0
1	1	0	1	1	X	0	X	0
1	1	1	0	0	0	1	0	1

K-Map for SA

	Bx	00 Bx'	01 Bx	11 Bx	10 Bx'
A					
0 A'					1
1 A	X	X			X

$$SA = BX'$$

K-Map for RA ,

	Bx	00 Bx'	01 Bx'	11 Bx	10 Bx'
A					
0 A'	X	X	X		
1 A			1		

$$RA = Bx$$

K-Map for SB

	Bx	00 Bx'	01 Bx'	11 Bx	10 Bx'
A					
0 A'		1		X	
1 A		1			X

$$SB = B'x$$

K-Map for RB

	Bx	00 Bx'	01 Bx'	11 Bx	10 Bx'
A					
0 A'	X				1
1 A	X		1		

$$RB = ABx + A'x'$$

So, the sequential circuit using SR-Flip flop is given below;

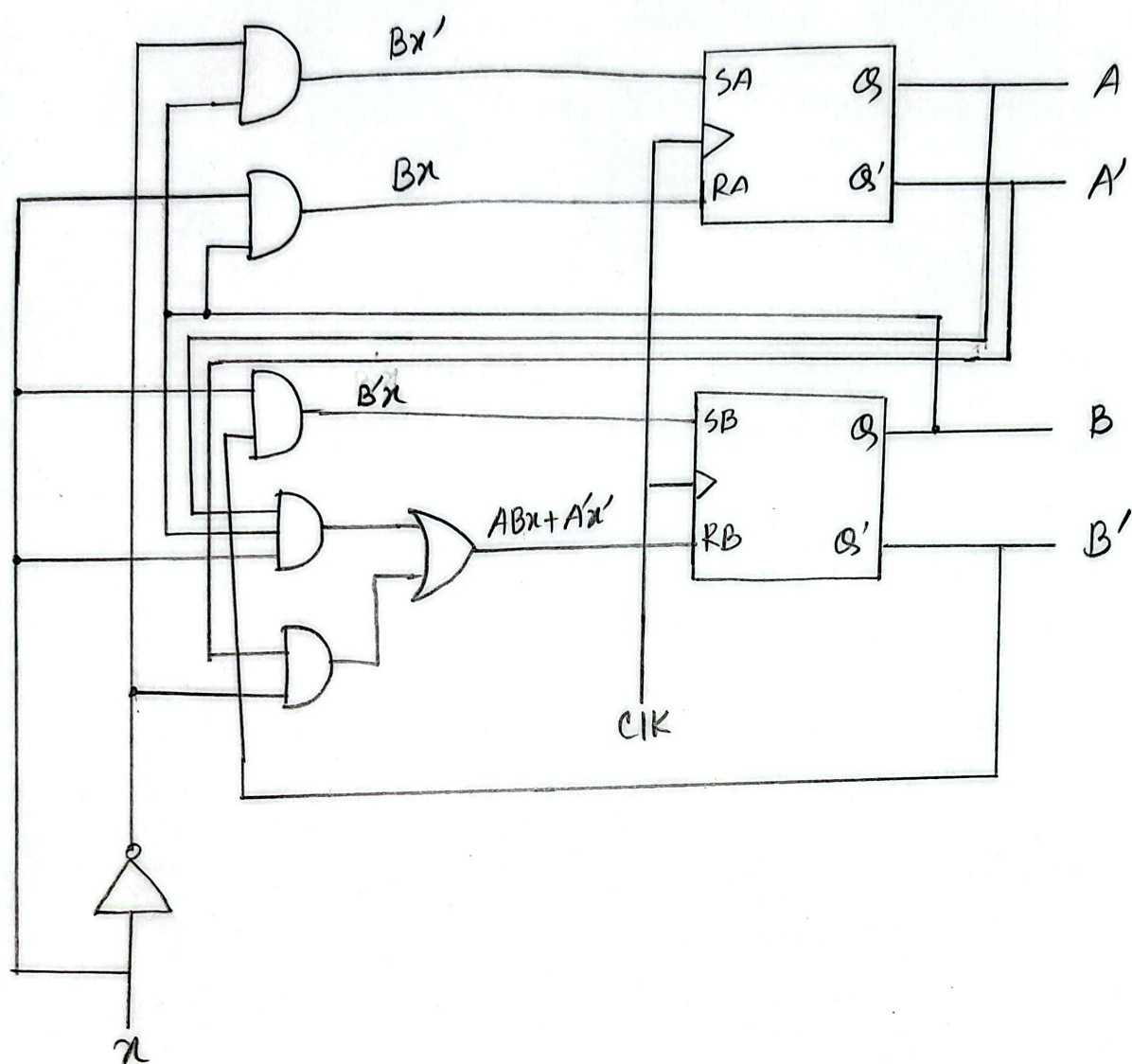
functions are,

$$SA = Bx'$$

$$SB = B'x$$

$$RA = Bx$$

$$RB = ABx + A'x'$$



So, since we already have the logic diagram and the equations, we can build the state table from this, equations are,

$$\begin{aligned}
 SA &= Bx' \\
 SB &= B'x \\
 RA &= Bx \\
 RB &= ABx + A'x'
 \end{aligned}$$

SR Flip-Flop Truth Table

S	R	Q	Q'
0	0	No	change
0	1	0	1
1	0	1	0
1	1	Not	Used

State table

A	B	X	SA	RA	SB	RB	A+	B+
0	0	0	0	0	0	1	0	0
0	0	1	0	0	1	0	0	1
0	1	0	1	0	0	1	1	0
0	1	1	0	1	0	0	0	1
1	0	0	0	0	0	0	1	0
1	0	1	0	0	1	0	1	1
1	1	0	1	0	0	0	1	1
1	1	1	0	1	0	1	0	0

Now, we can draw the state diagram from the state table,

State Diagram:

