

## \* Finite-state Machine:

A state machine is a behavior model. It consists of a finite number of state, therefore it is called Finite-state Machine.

For represent Finite-state Machine, we have to use Finite-state machine diagram.

For represent the state machine we have to use Mealy and Moore machine diagram.

Mealy and Moore models are the basic models of state machines.

For draw the Mealy and Moore model, we have to draw every machine Characteristics table, Truth table and Excitation table.

### - Excitation table:

This table shows the minimum inputs to generate the next state.

Excitation table is require to show minimal inputs to generate the next state.

### - Characteristic table:

Characteristic table usually tells how the control bit affects the current state to produce the next state.

\* Draw Mealy and Moore model for the following Flip-Flop.

a SR Flip-Flop

b D Flip-Flop

c T Flip-Flop

d JK Flip-Flop.

## A SR Flip-Flop:

For draw the Mealy and Moore model, we have to draw Excitation table, Characteristic table and Truth table.

- Truth table For SR Flip-Flop:

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

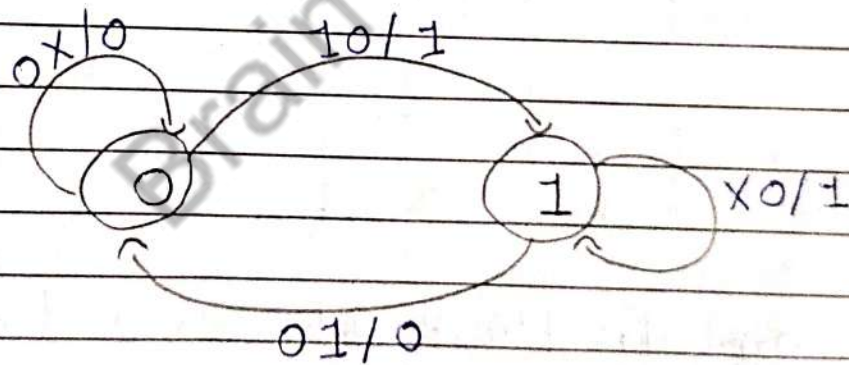
- Using Truth table, we have to draw Characteristic table.

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

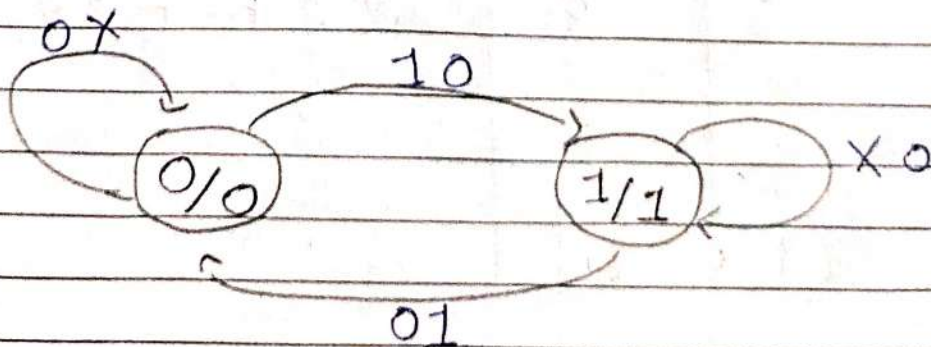
- Using Truth table, we have to draw Excitation table,

Present State	Next State	I/P	
		S	R
Q(t)	Q(t+1)		
0	0	0	X
0	1	1	0
1	0	0	1
1	1	X	0

- Mealy Model:



- Moore Model:



## B D Flip-Flop:

For draw the Mealy model and Moore model, we have to draw Truth table, Characteristic table and Excitation table.

- Truth table For D Flip-Flop:

Q	D	$Q_{(t+1)}$
0	0	0
0	1	1
1	0	0
1	1	1

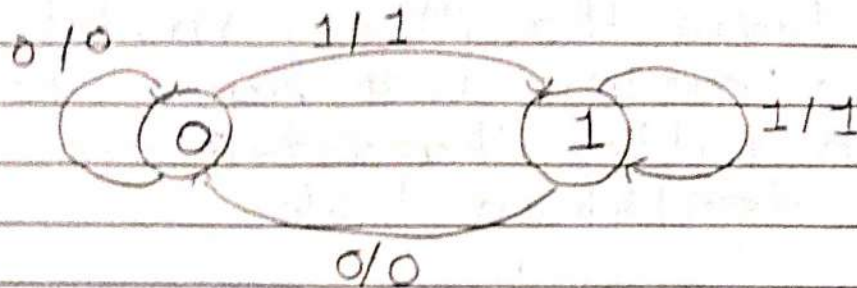
- Using truth table, we have to draw characteristic table.

D	$Q_{(t+1)}$
0	0
1	1

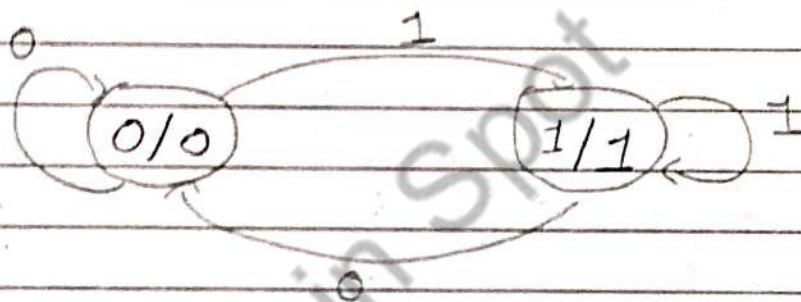
- Using Truth table, we have to draw Excitation table.

$Q_{(t)}$	$Q_{(t+1)}$	D
0	0	0
0	1	1
1	0	0
1	1	1

- Mealy Model:



- Moore Model:



c T Flip-Flop:

For draw the Mealy and Moore model, we have to draw truth table, characteristic table and Excitation table.

- Truth table For T Flip-Flop:

Q	T	Q(t+1)
0	0	0
0	1	1
1	0	1
1	1	0

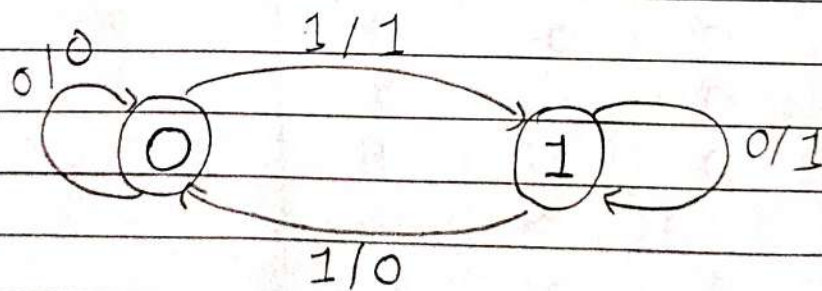
- Using Truth table, we have to draw characteristic table,

$Q(t)$	T	$Q(t+1)$
0	0	0
0	1	1
1	0	1
1	1	0

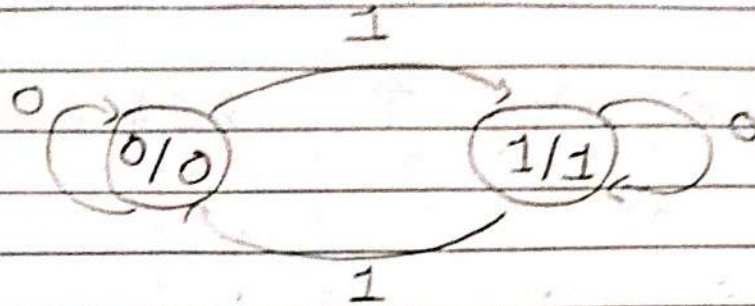
- Using Truth table, we have to draw Excitation table,

$Q(t)$	$Q(t+1)$	T
0	0	0
0	1	1
1	0	1
1	1	0

- Mealy Model:



- Moore Model:



① JK Flip-Flop:

For draw the mealy and moore model, we have to draw Truth table, Characteristic table and Excitation table.

- Truth table For JK Flip-Flop:

Q	J	K	Q(t+1)
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0



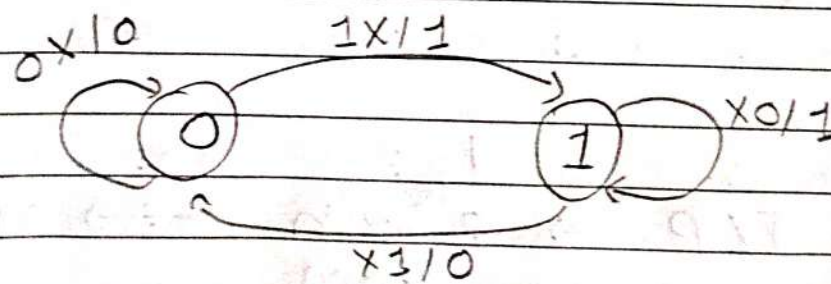
- Using the Truth table, we have to draw characteristic table,

J	K	$Q(t+1)$
0	0	$Q(t)$
0	1	0
1	0	1
1	1	$Q'(t)$

- Using truth table, we have to draw Excitation table,

$Q(t)$	$Q(t+1)$	J	K
0	0	0	X
0	1	1	X
1	0	X	1
1	1	X	0

- Mealy Model:



- Moore Model:

