DIGITAL ELECTRONICS:
SR FLIPFLOP

SNS COLLEGE OF ENGINEERING

Kurumbapalayam (PO), Coimbatore – 641 107

An Autonomous Institution

Accredited by NAAC – UGC with 'A' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SR FlipFlop

Dr.G.Arthy
Assistant Professor
Department of EEE
SNS College of Engineering

SR FLIPFLOP

- ✓ FlipFlops are digital circuits that store a single bit of information and hold its value until it is updated by new input signals.
- ✓ They are used in digital systems as temporary storage elements to store binary information.
- ✓ FlipFlops are latches with clocks. They are commonly edge-sensitive devices. FlipFlops are useful for the design of the synchronous sequential circuit.

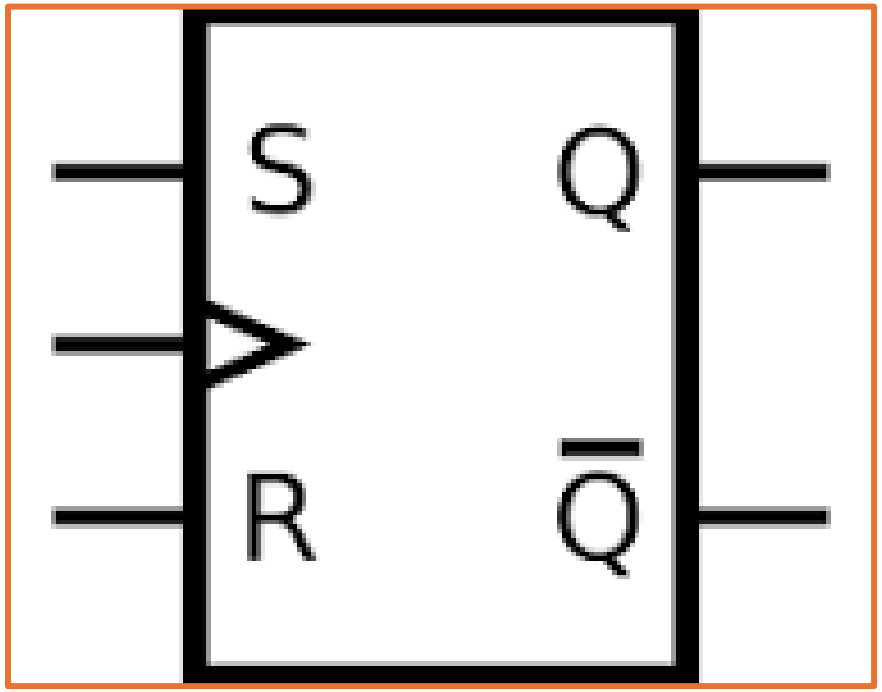
SR FLIPFLOP

APPLICATIONS

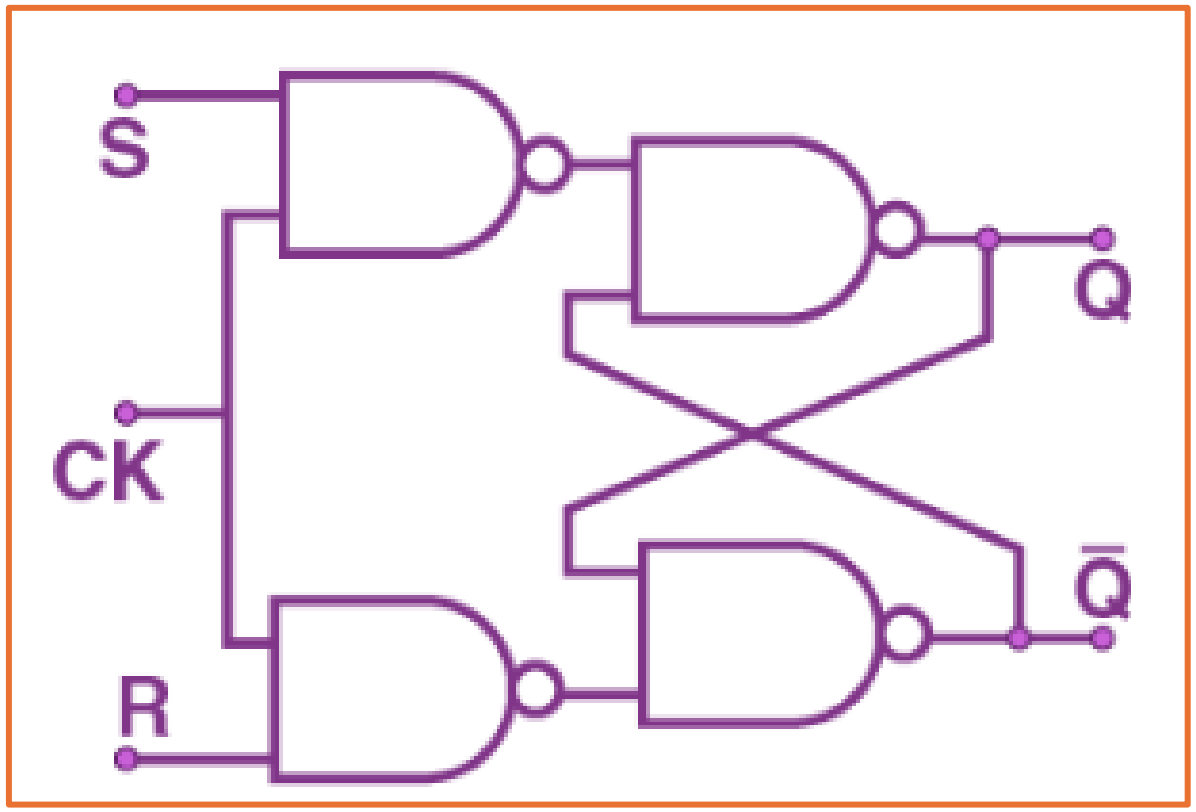
- ✓ Flip Flops are used as the basic storage unit.
- ✓ Flip Flops are used as counters.
- ✓ flip flop is its use as Frequency Dividers
- ✓ Flip Flops also find their application in digital signal processing which is very crucial in electronics. In DSP, flip flops are used for data sampling, buffering, and synchronization of data.
- ✓ Flip Flops are largely used as shift registers

SR FLIP FLOP

- ✓ It consists of two inputs namely ‘Set’ and ‘Reset’ pin and it has corresponding output pins Q and Q’. When the input of ‘S’ pin is high, the output ‘ is high and Q’ is low.



SR FLIPFLOP WITH NAND GATE



SR FLIPFLOP TRUTH TABLE

INPUTS			OUTPUT	STATE
CLK	S	R	Q	
X	0	0	No Change	Previous
↑	0	1	0	Reset
↑	1	0	1	Set
↑	1	1	-	Forbidden

SR FLIPFLOP CHARACTERISTIC TABLE

The characteristic table for this type of flip-flop exhibits the transition of present state to next state based on the input conditions and clock triggers.

SR Flip-Flop Characteristic Table			
S	**R**	**Q_n**	**Q_{n+1}**
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	X
1	1	1	X

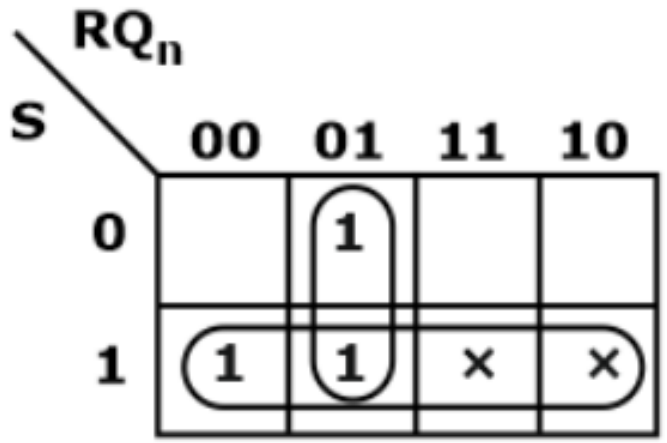
SR FLIPFLOP EXCITATION TABLE

The excitation table of SR flip-flop indicate the excitations required to take the flip-flop from the present state to the next state.

Qn	Qn+1	S	R
0	0	0	X
0	1	1	0
1	0	0	1
1	1	X	0

SR FLIPFLOP CHARACTERISTIC EQUATION

The characteristic equation is an algebraic expression for the characteristic table's binary information. It specifies the value of the next state of a flip-flop in terms of its present state and present excitation.



The characteristic equation of SR flip-flop from the above K-map is

$$Q_{n+1} = S + \bar{R}Qn$$

Assessment

1. What is the difference between latch and Flipflop?

2. List few applications of Flipflop.


Thank
you