EXPERIMENT NO 8 FLIP FLOPS

AIM : Truth Table verification of

1) SR Flip Flop
2) JK Flip Flop.
3) T Flip Flop.
4) D Flip Flop

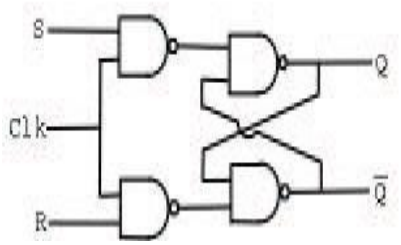
LEARNING OBJECTIVE:

- To learn about various Flip-Flops conversions
- To learn about applications of FlipFlops

COMPONENTS: ICs 7400, 7402, 7476, LED.

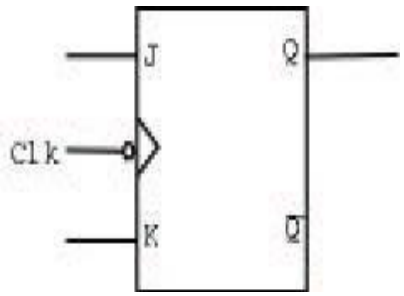
CIRCUIT DIAGRAM **TRUTH TABLE**

1.SR Flip flop using nand gate



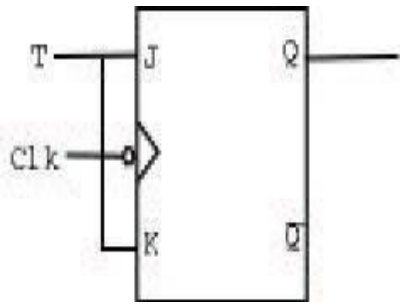
Clk	S	R	Qn
0	X	X	
↓	0	0	
↓	0	1	
↓	1	0	
↓	1	1	

2.JK FF (IC 7476)



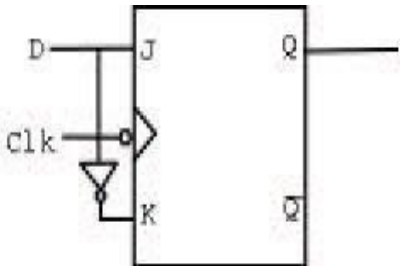
Clk	J	K	Qn
0	X	X	
↓	0	0	
↓	0	1	
↓	1	0	
↓	1	1	

3.T FF using JK



Clk	T	Qn
↓	0	
↓	1	

4.D FF using JK



Clk	D	Qn
↓	0	
↓	1	

THEORY:

Logic circuits that incorporate memory cells are called sequential logic circuits; their output depends not only upon the present value of the input but also upon the previous values. Sequential logic circuits often require a timing generator (a clock) for their operation. The latch (flip-flop) is a basic bi-stable memory element widely used in sequential logic circuits. Usually there are two outputs, Q and its complementary value.

Basically, a flip flop has two inputs. The other input is the clock. The clock input is usually drawn with a triangular input. These flip-flops are *positive edge-triggered flip flops*. This means that the flip flops can only change output values when the clock is at a positive edge. There are also negative edge triggered flip flops, which change on a negative edge, and level - triggered flip flops, that change only when the value is 1. We consider only positive edge - triggered flip flops. When the clock is not at a positive edge, then the output value is held. That is, it does not change. A flip flop also has two outputs, **Q** and **Q'**. The output is really the bit that's stored. Thus, the flip flop is always outputting the one bit of information. There are different types of FFs . They are S-R, J-K, D & T.

PROCEDURE :

1) Give biasing to the IC and do necessary connections.
2) For various combinations of input verify the truth table.

Post lab Questions

1. List the applications of flip flops
2. Explain Master Slave Flip flop with neat timing diagram
3. Convert D FF to SR FF
4. Convert SR to JK FF