COMPUTER ENGINEERING

DLCA ODD SEM 2021-22/EXPERIMENT 4

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Experiment No :- 04

Aim :- Study a filp flop IC

Theory :-

A flip flop is an electronic circuit with two stable states that can be used to store binary data.

The stored data can be changed by applying varying inputs. Flip flop and latches are fundamental building blocks of digital electronic system used in compulsers, communication and many other types of stems. Both are used as data storage elements. It is the basic storage element in logic unit.

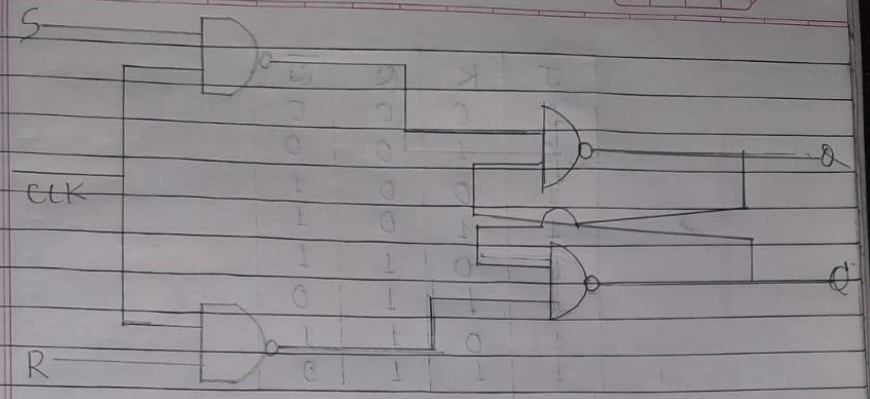
Types of Flip Flops

1. SR flip flop :-

→ This simple flip flop circuit has a set input (S) and reset input (R). In this system when you set 'S' as active, the output 'Q' would be high and 'Q' will be low.

→ Once the inputs are established, the wiring of the circuit is maintained until "S" or "R" go high or power is turned off.

S	R	Q	Q'
0	0	0	1
0	1	0	1
0	1	1	0
1	1	∞	∞

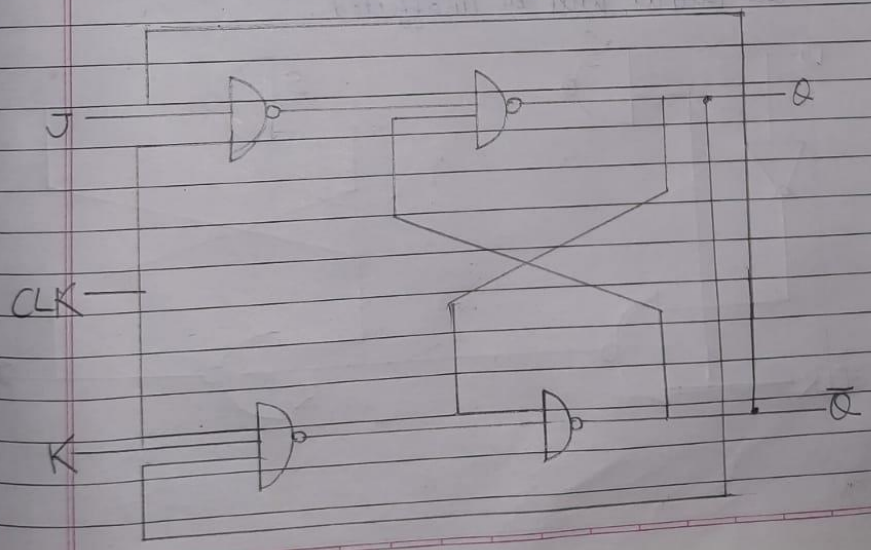


2. JK Flip Flop :-

→ The JK flip flop is an improvement on the SR flip flop where S=R=1 is not a problem.

→ The input condition of J=K=1 gives an output inverting the output state.

→ If J and K both are high at clock edge then the output will toggle from one state to other.



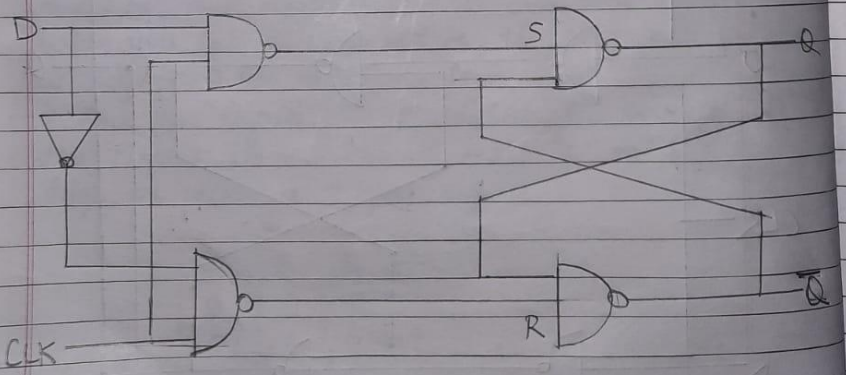
J	K	Q	$\overline{Q}$
0	0	0	0
0	1	0	0
1	0	0	1
1	1	0	1
0	0	1	1
0	1	1	0
1	0	1	1
1	1	1	0

3. D Flip Flop :-

→ It is better alternative that is very popular with digital electronics.

→ They are commonly used for counters and shift registers and input Syncronisation.

→ In this output can be changed at the clock edge and if the input changes at other times, the output will be unaffected.

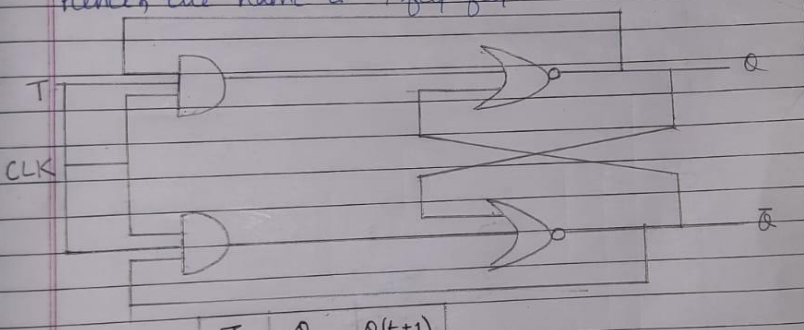


CLOCK	D	Q	$\bar{Q}$
↓ >> 0	0	0	1
↑ >> 1	0	0	1
↓ >> 0	1	0	1
↑ >> 1	1	1	0

4. T Flip Flop :-

→ These are basically a single input version of JK flip flops. This modified form of JK flip flop is obtained by connecting both inputs J and K together. It has only one input with the clock output.

→ These flip flops are called T flip flops because of their ability to complete its state i.e Toggle. Hence, the name is T flip flops.



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

Conclusion :- Hence, I have successfully studied flip flops and its types.