Experiment No. 4
Study of flip flop IC
Name: Sharvari Anand Bhondekar
Roll Number: 06
Date of Performance:
Date of Submission:

Aim - Study of flip flop IC

Objective -

1. Understand the function of different types of flip-flops (SR, JK, D, and T flip-flops).
2. Learn how to implement and test flip-flops using ICs.
3. Analyze the behavior of flip-flops with different input conditions, including their role in memory storage and sequential circuits.

Theory -

Flip-flops are basic building blocks in digital electronics used for storage and synchronization of data. They are bistable devices, meaning they have two stable states, 0 and 1, and can be used to store a single bit of data. The different types of flip-flops include:

1. **SR Flip-Flop (Set-Reset):** The SR flip-flop has two inputs, Set (S) and Reset (R), and two outputs, Q and Q'. When Set is high, the output Q becomes 1, and when Reset is high, the output Q becomes 0.

2. **JK Flip-Flop:** The JK flip-flop is an improvement over the SR flip-flop, where the invalid state is eliminated. It has two inputs, J and K. When both inputs are high, the output toggles between 1 and 0.

3. **D Flip-Flop (Data or Delay Flip-Flop):** The D flip-flop has a single input, D. The output Q takes the value of D on the triggering edge of the clock signal, effectively "locking" the data at that moment.

4. **T Flip-Flop (Toggle Flip-Flop):** The T flip-flop is a simplified version of the JK flip-flop where both inputs are tied together. It toggles its output on every clock pulse when the input is high.

Conclusion -

This experiment provided a clear understanding of how flip-flop ICs function as fundamental elements of memory and sequential circuits. By implementing SR, JK, D, and T flip-flops, the experiment demonstrated their individual behavior in response to various input conditions. The role of flip-flops in storing data and controlling state transitions in digital systems was successfully verified through the testing and analysis of flip-flop circuits.