

NEUB CSE 222 LAB 9: Latches and Flip-Flops

North East University Bangladesh

Department of CSE

Course no: CSE 222

Experiment no: 09

Experiment Name: Latches and Flip-Flops

CAUTIONS:

1. Don't switch on the supply of the circuit until you have verified the circuit carefully
2. Take readings of apparatus carefully
3. Take care of any bare circuit elements in energized condition
4. Never try to touch bare live wires

Objective

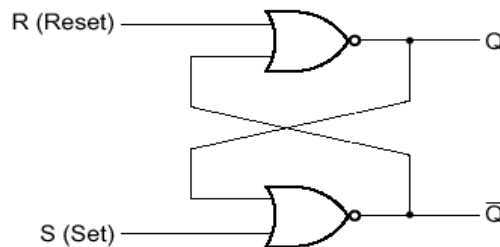
The primary objective of this experiment is to understand how latches and flip-flops can be designed using fundamental gates and verify functionality of some commonly used Flip-Flop ICs.

Apparatus Needed

- Trainer Board (Bread board)
- Logic Gate ICs (You decide what you need)
- Connecting wires
- LEDs
- Push Buttons / DIP switch
- Logic gates
- Flip-Flops: 74HC107, 74HC109, 74HC74

Procedure

1. Design the S-R Latch using gates and verify the function table

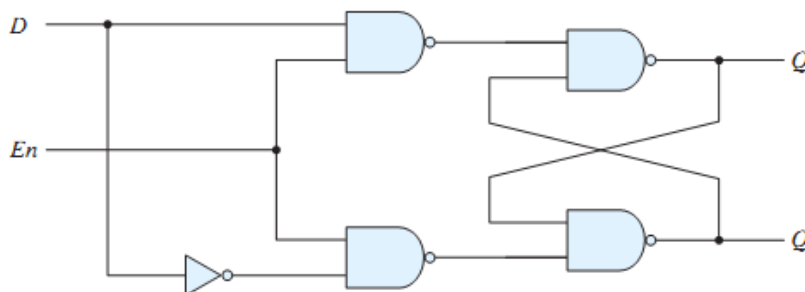


(a) Logic diagram

S	R	Q	\bar{Q}
1	0	1	0
0	0	1	0
0	1	0	1
0	0	0	1
1	1	0	0

(b) Function table

2. Design the D Latch using gates and verify the function table



(a) Logic diagram

En	D	Next state of Q
0	X	No change
1	0	$\bar{Q} = 0$; reset state
1	1	$\bar{Q} = 1$; set state

(b) Function table

3. Find information about 74HC107, 74HC109, 74HC74 ICs and mention what are they used for
 - a. 74HC107
 - b. 74HC109
 - c. 74HC74

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4. Verify the function tables of
 - a. 74HC107
 - b. 74HC109
 - c. 74HC74
5. Use JK Flip-Flop from ICs mentioned in part 3 to design a T Flip-Flop.

Report

1. For the parts where schematic is not provided, design a circuit from block diagram provided.
2. Mention the tests and results for checking the circuits.
3. Comment on the learning from this LAB