

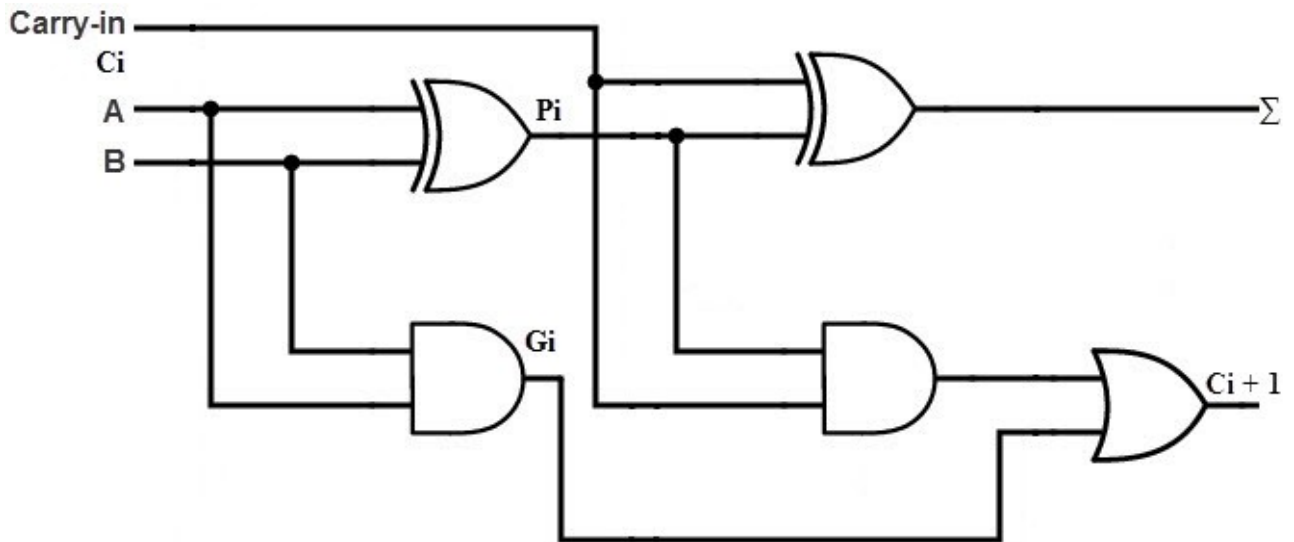
# ASSIGNMENT 6

## AIM:

To design 8-Bit Adder, 8-Bit Register and 16-Bit Counter.

## CIRCUIT:

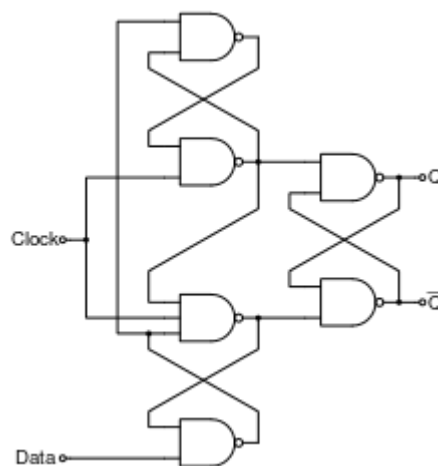
1. 8-Bit Adder has been constructed as follows -



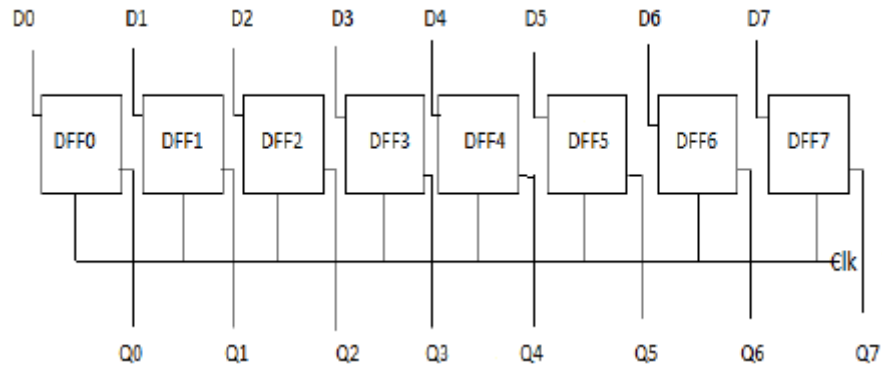
1-Bit Adder

8 of these bit adders are joined together to form the 8-bit adder.

2. 8-Bit Register has been constructed by first constructing as follows -

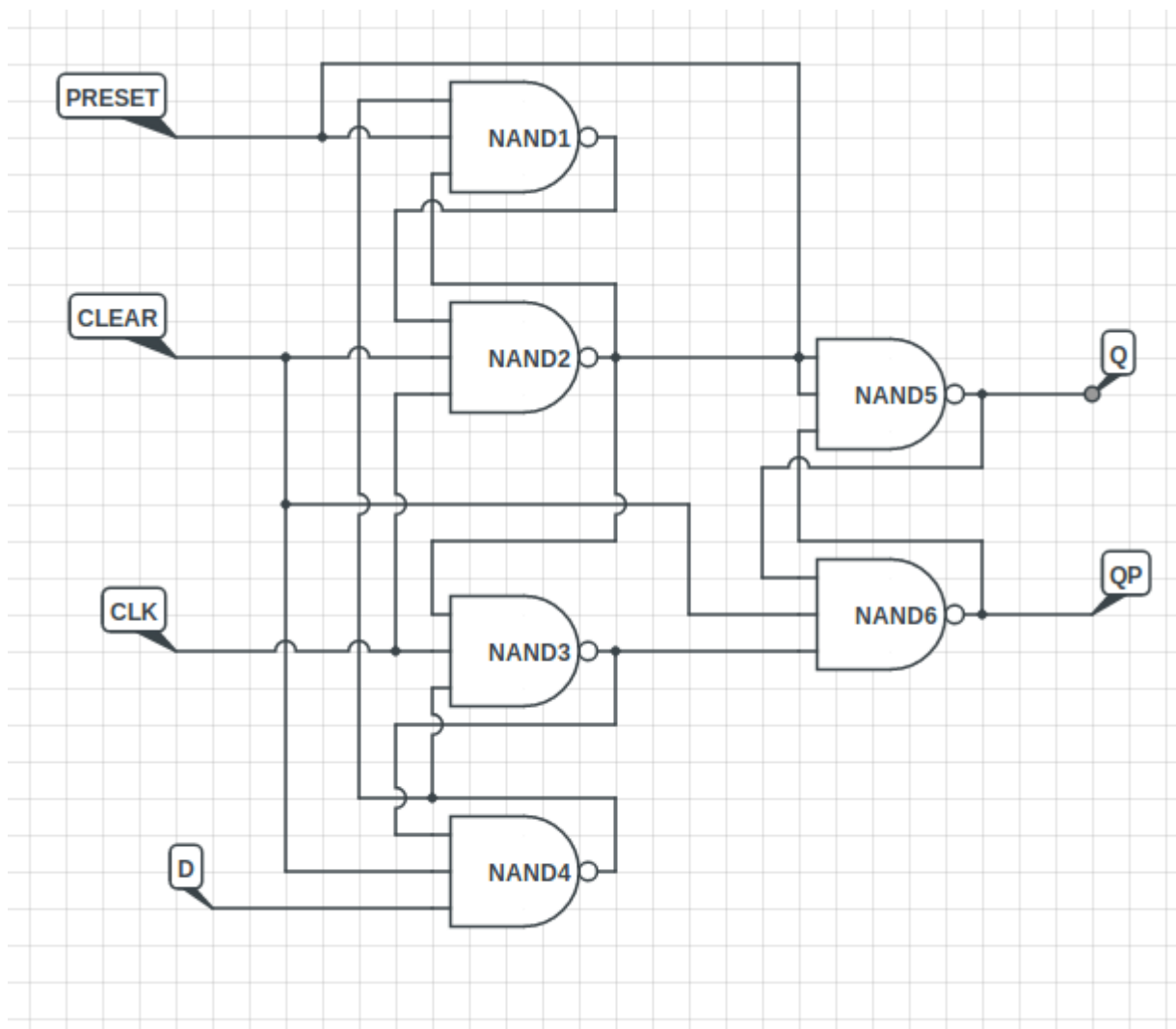


8 of these registers are joined together to form an 8-bit register as follows

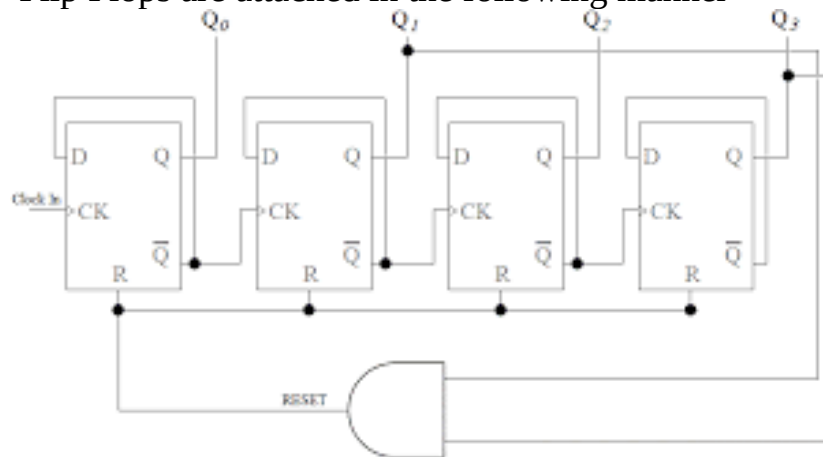


### 3. 16-Bit Binary Ripple Counter using 16 D-Flip Flops

A single D-Flip Flop with CLEAR and PRESET pins is built as such -



16 of these D-Flip Flops are attached in the following manner



## **OBSERVATIONS:**

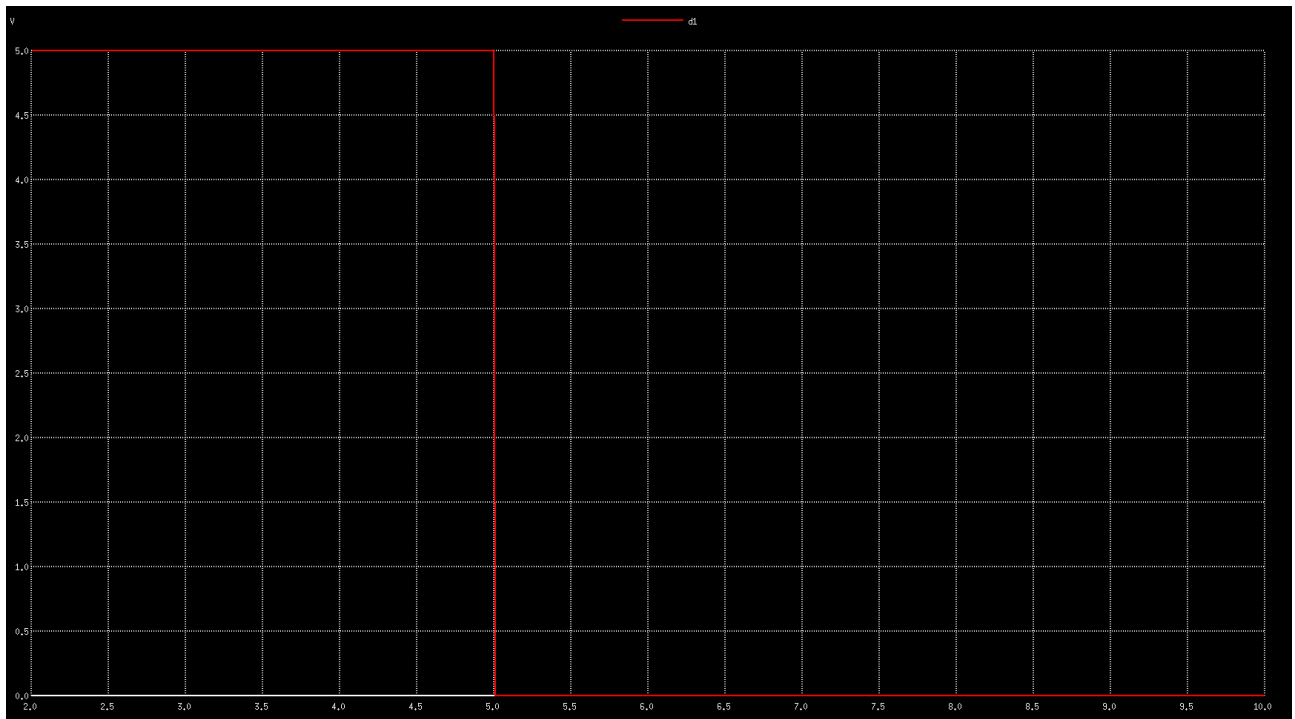
1. The adder worked correctly for  $0110011 + 11001100 = 00110100$ , Cout=1

```
No. of Data Rows : 1
0 = 0.000000e+00
0 = 0.000000e+00
1 = 1.000000e+00
0 = 0.000000e+00
1 = 1.000000e+00
1 = 1.000000e+00
0 = 0.000000e+00
0 = 0.000000e+00
1 = 1.000000e+00
```

2. It can be seen that the register is storing the given data – (1 to 0 for D0 and 0 to 1 for D1)



D0



D1

## **CONCLUSION:**

The circuits work as expected except for propagation delays.