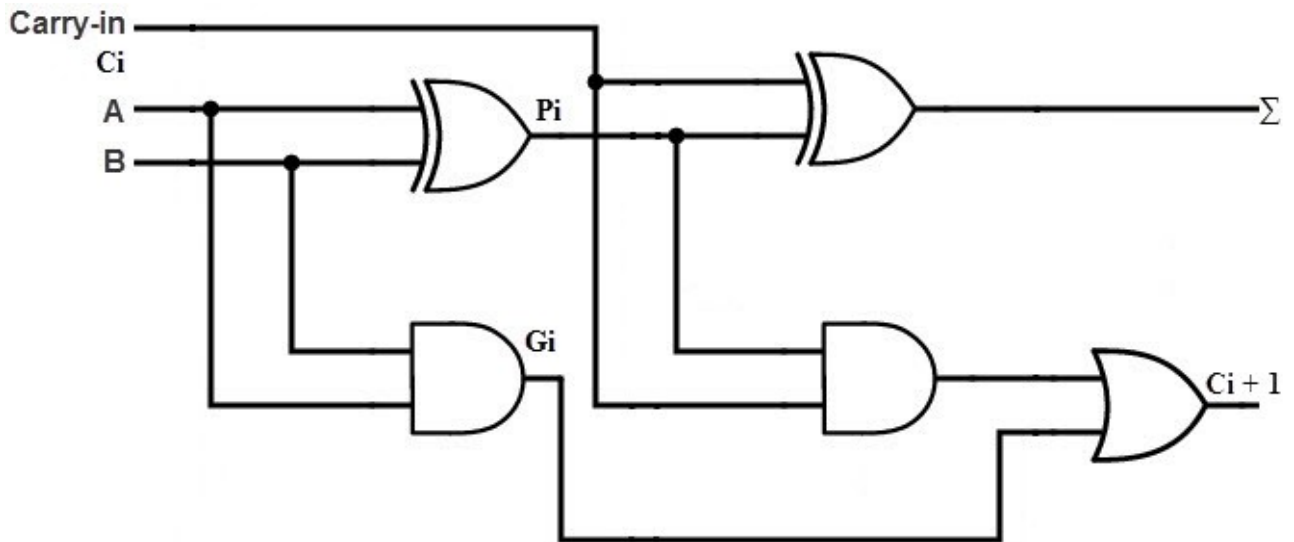# ASSIGNMENT 6

AIM:

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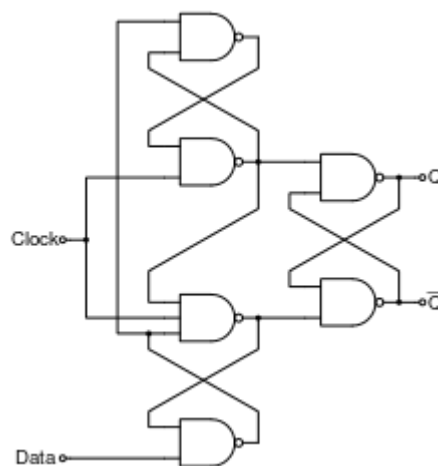
CIRCUIT:

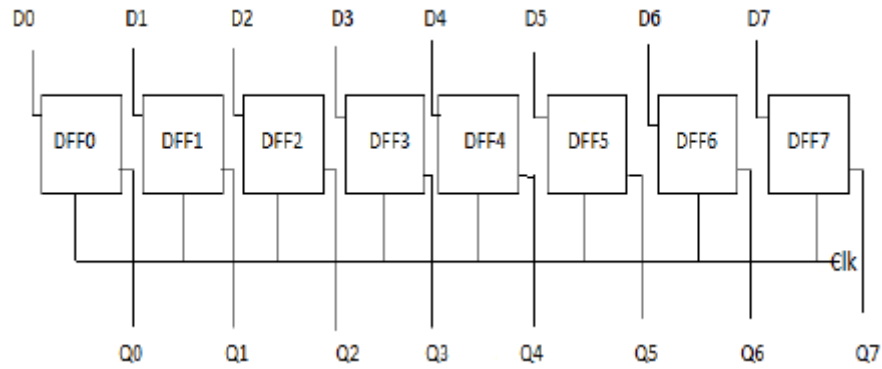1. 8-Bit Adder has been constructed as follows -

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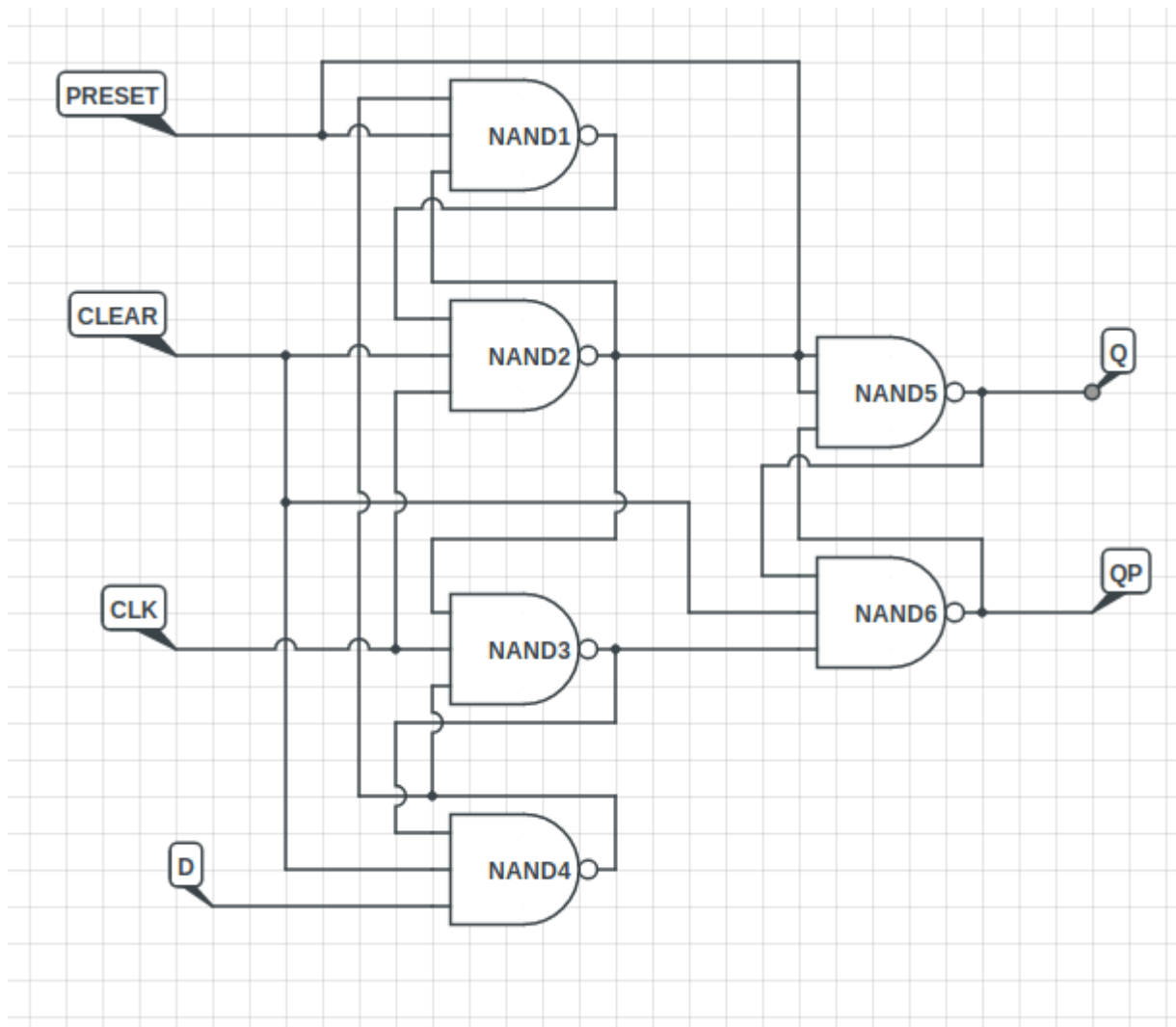
8 of these registers are joined together to form an 8-bit register as follows
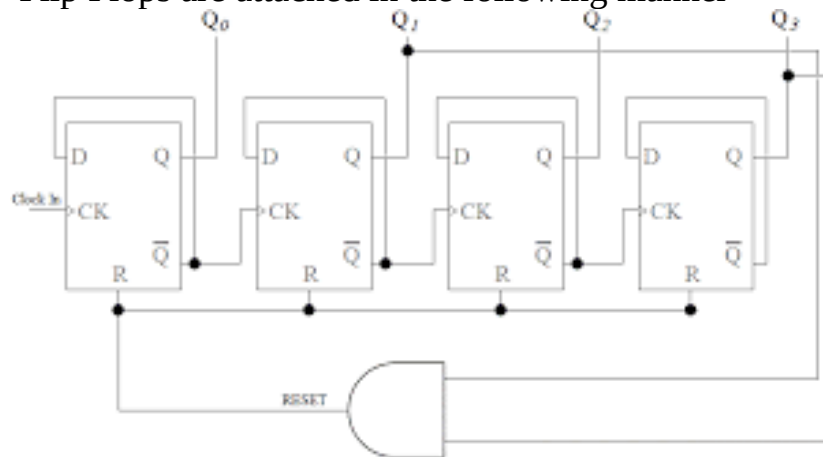

3. 16-Bit Binary Ripple Counter using 16 D-Flip Flops

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

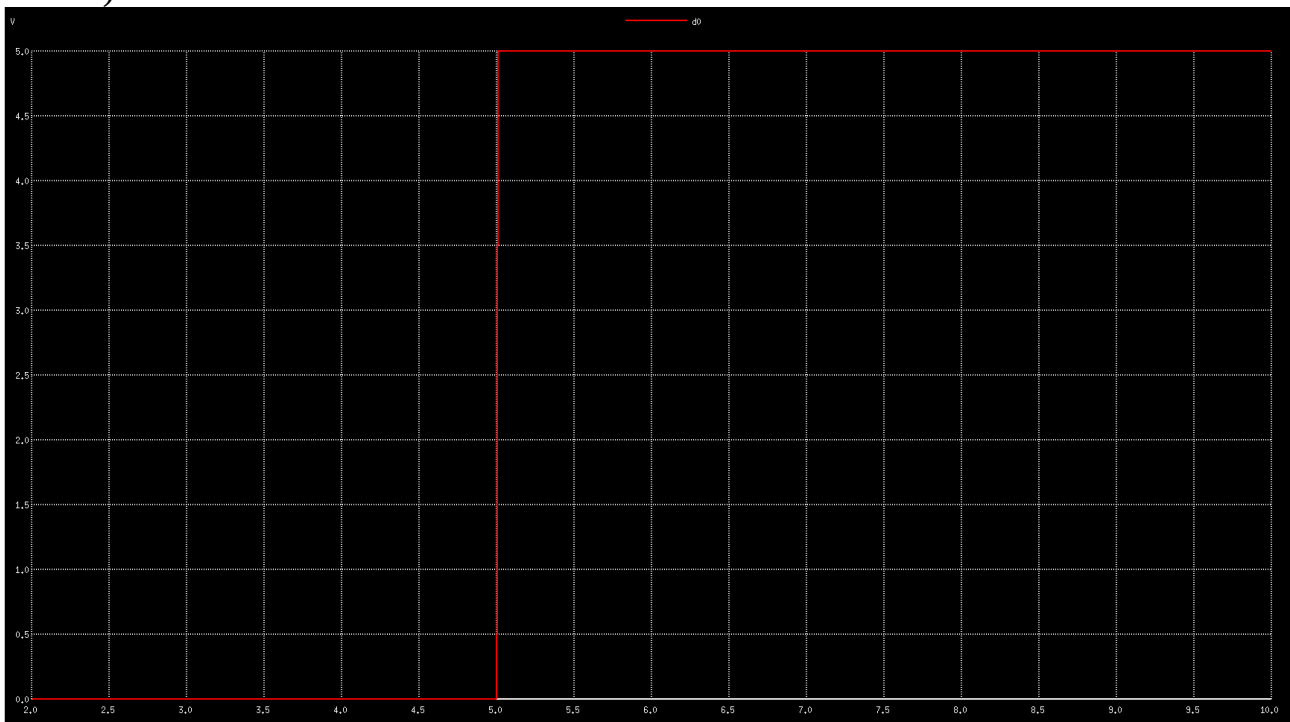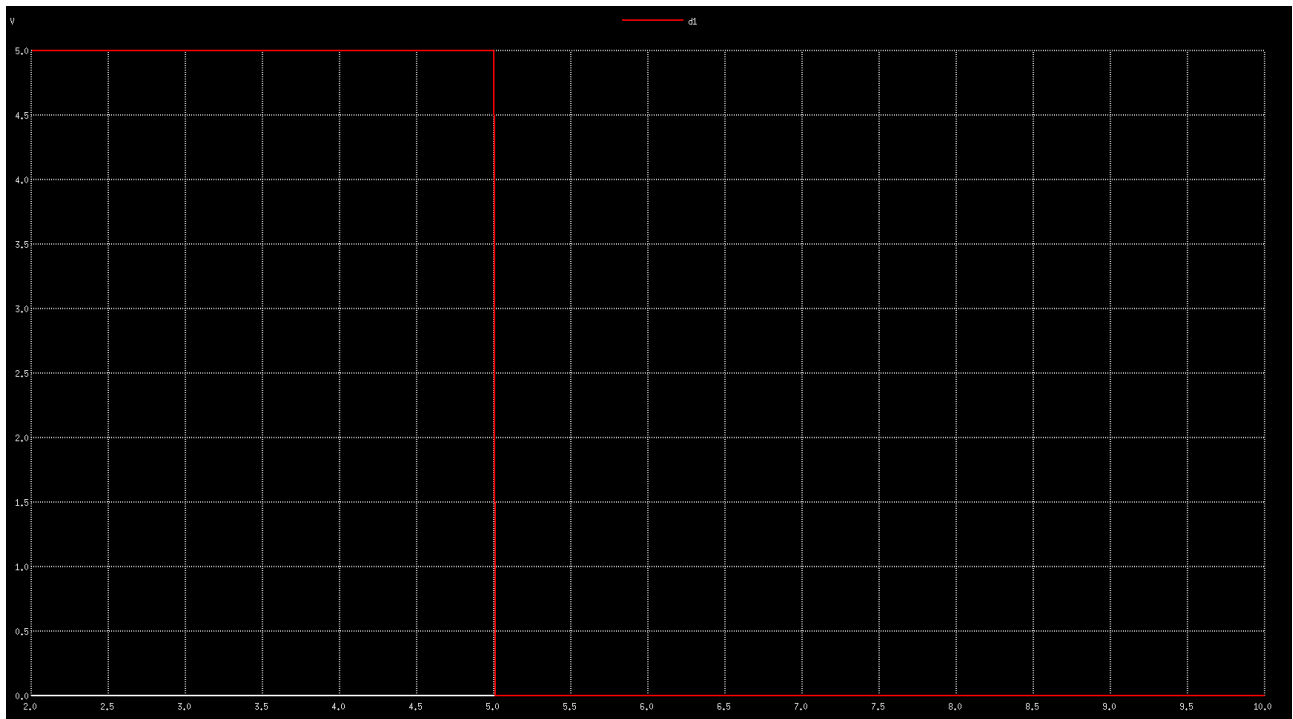16 of these D-Flip Flops are attached in the following manner

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 – (0 to 1 for D0 and 1 to 0 for D1)

D0

D1

CONCLUSION:
 The circuits work as expected except for propagation delays.