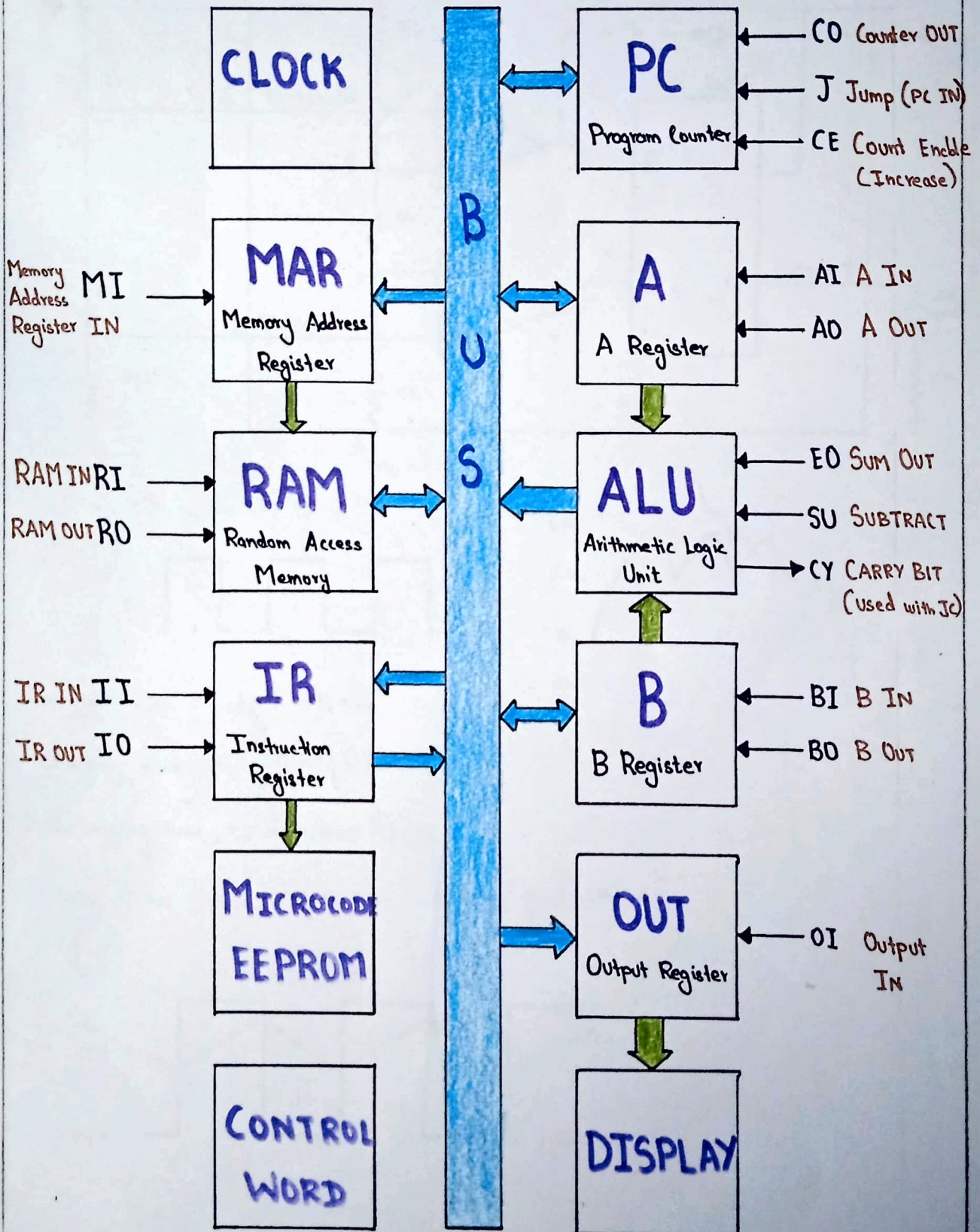

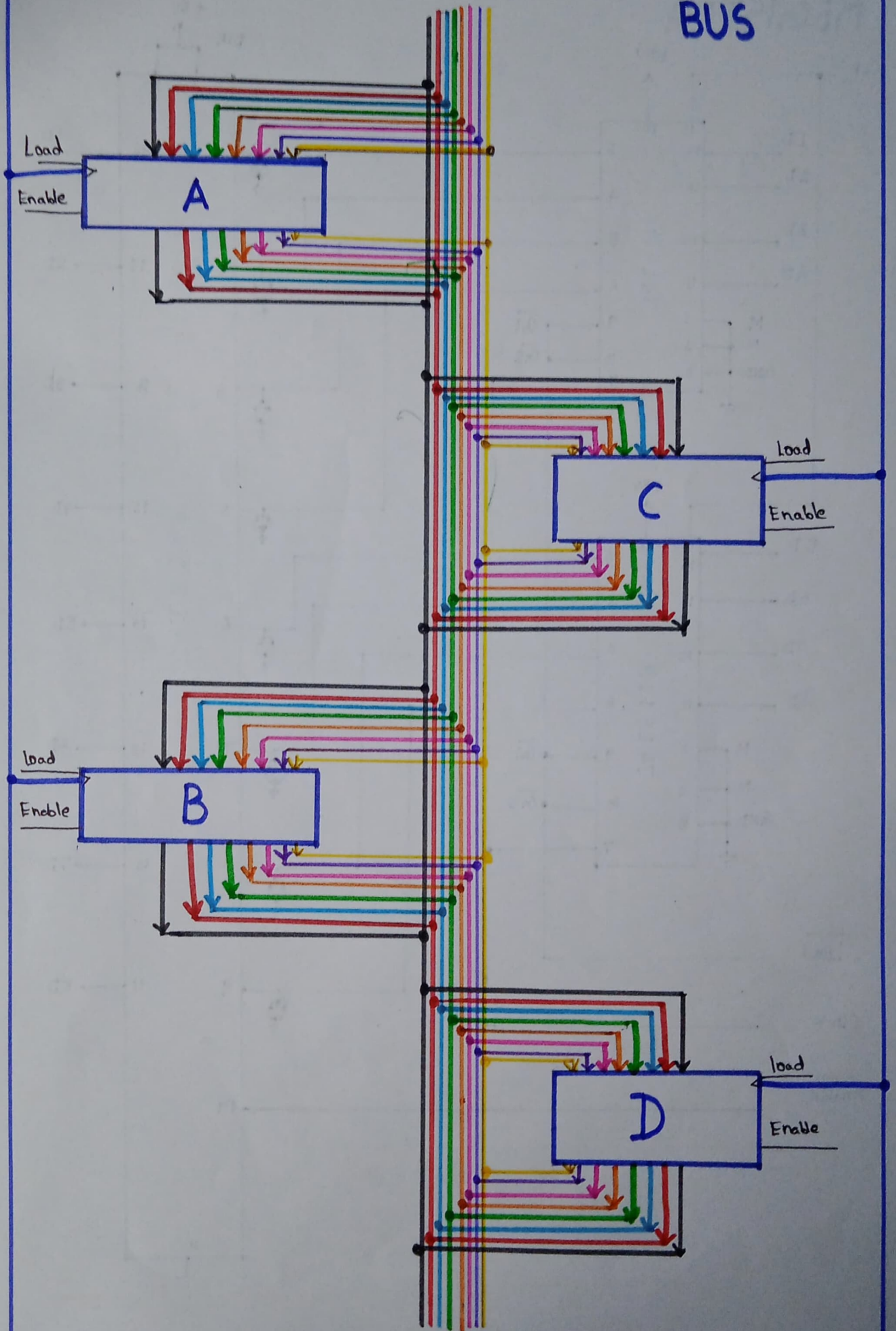


# 8 BIT CPU CONTROL SIGNAL

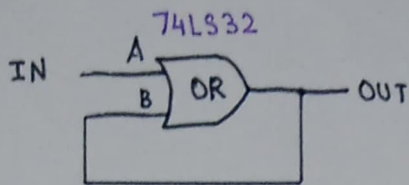


Clock 

BUS

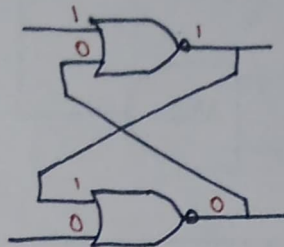
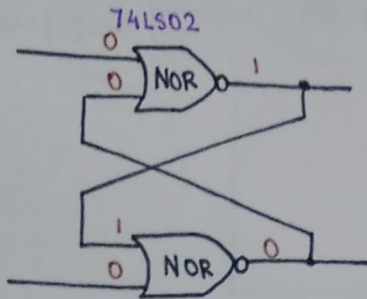






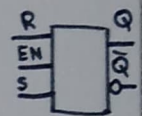
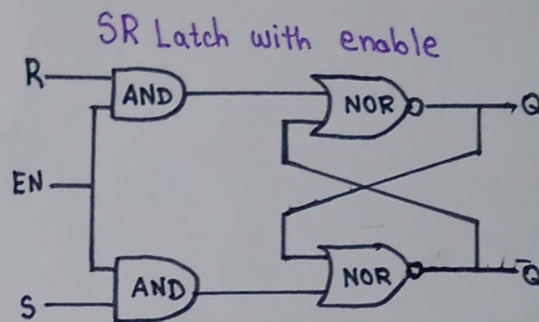
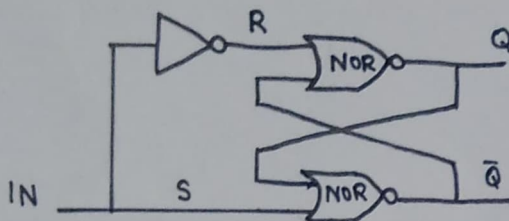
A	B	O/P
0	0	0
0	1	1
1	0	1
1	1	1

→ Turns off only when power is off

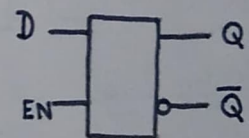
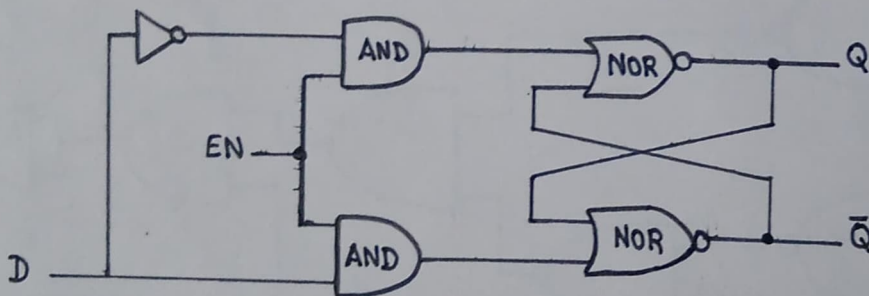


A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

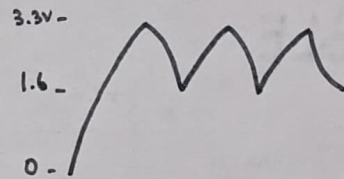
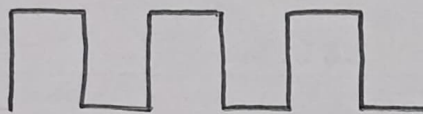
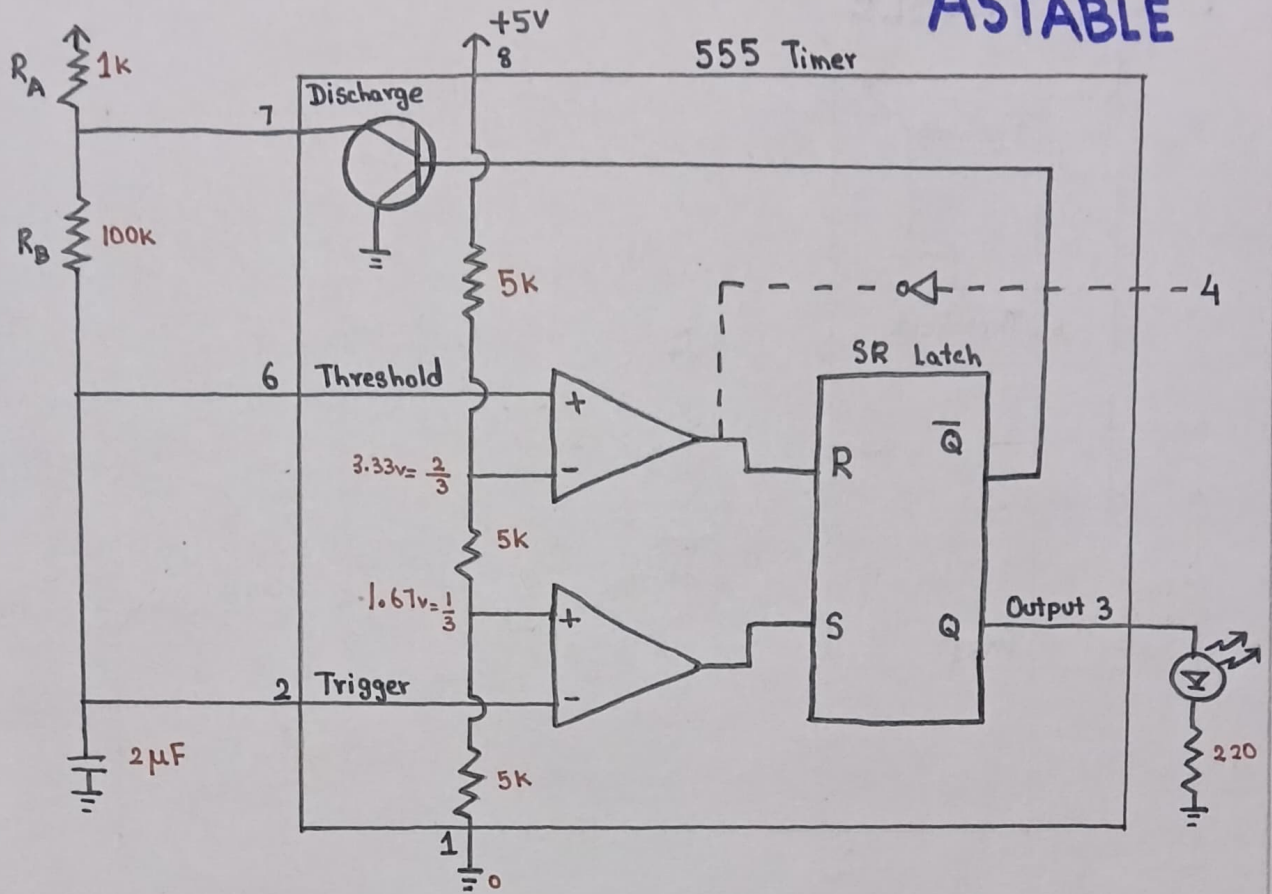
Quad  
NOR



D Latch



# ASTABLE

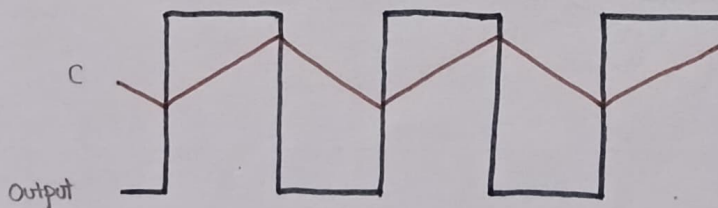


To find Time Period,  $T = t_1 + t_2$

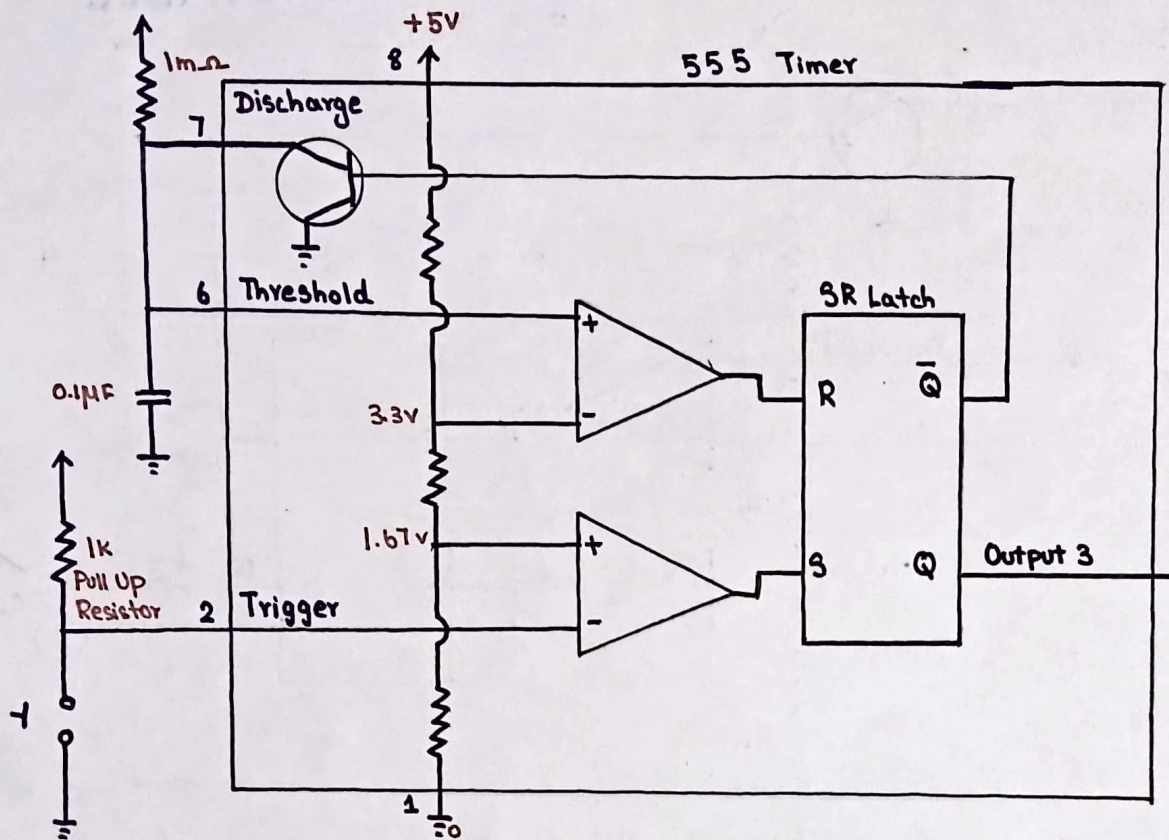
Charging time,  $t_1 = 0.693 (R_A + R_B) C$

discharging time,  $t_2 = 0.693 (R_B) C$

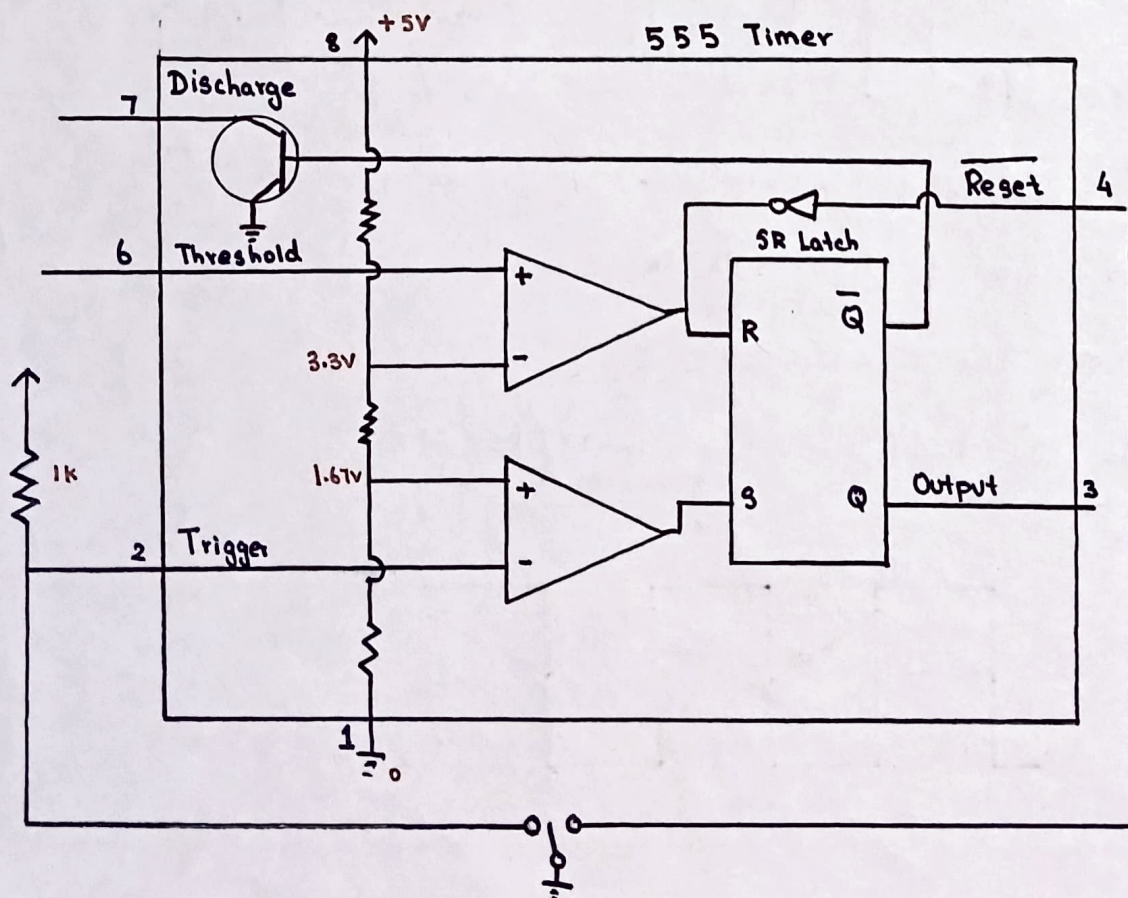
Total Time Period,  $T = t_1 + t_2 = 0.693 (R_A + 2R_B) C$ .



# MONOSTABLE

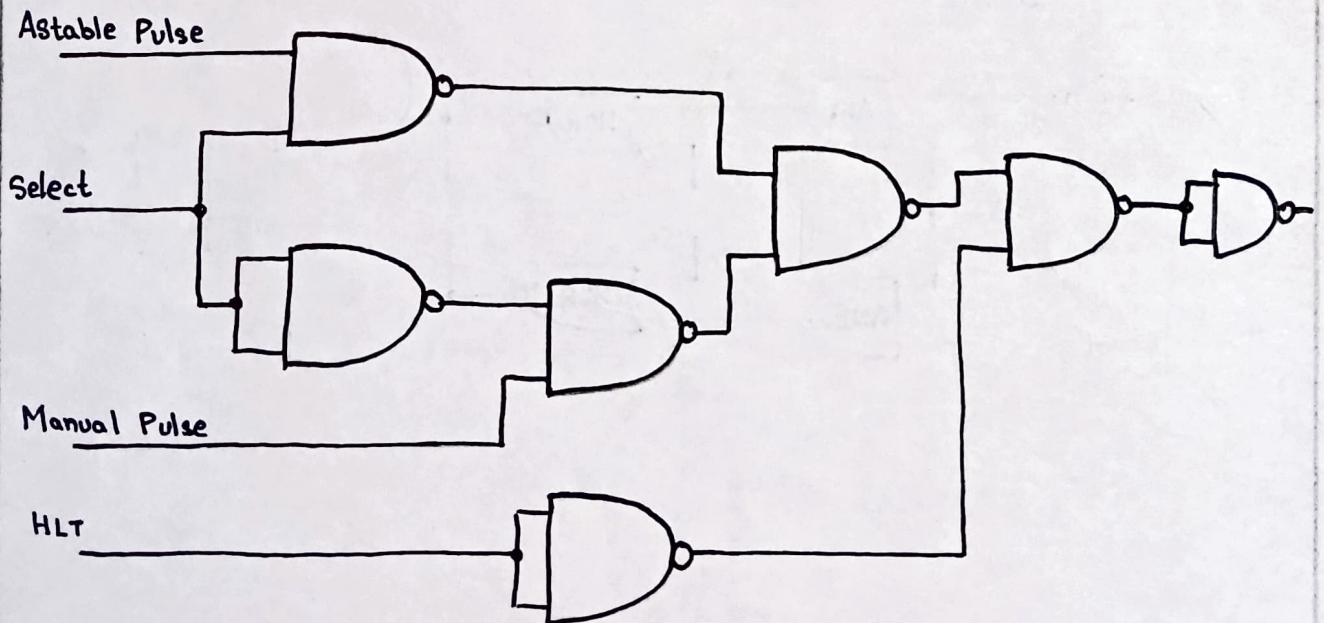
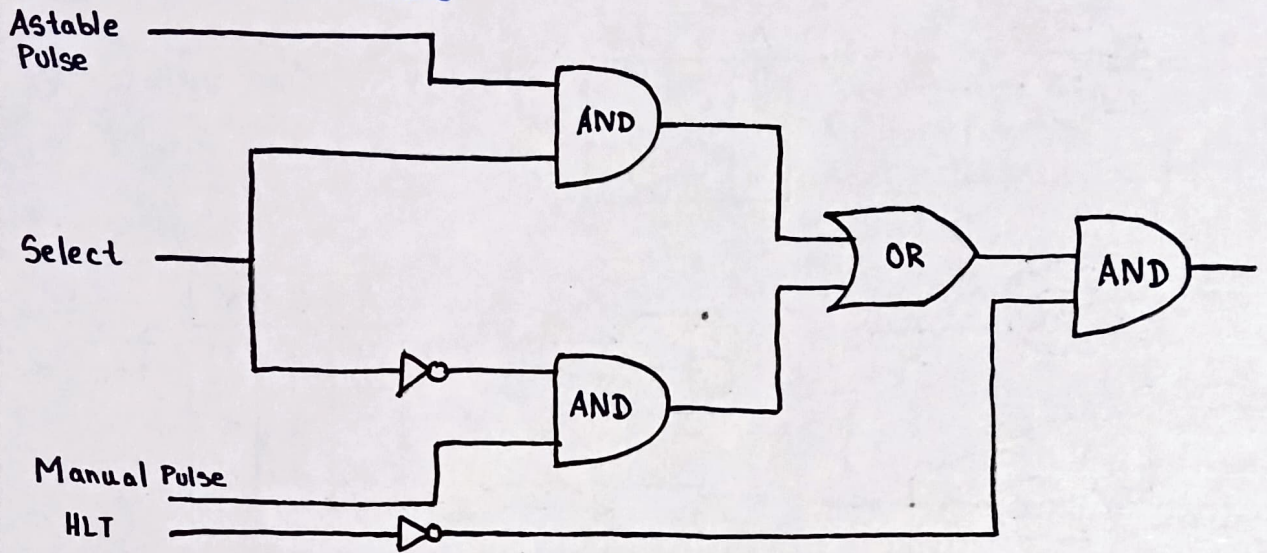


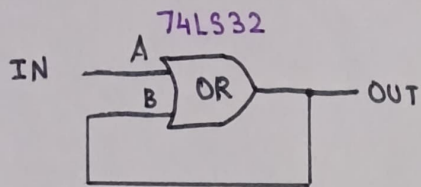
# BISTABLE





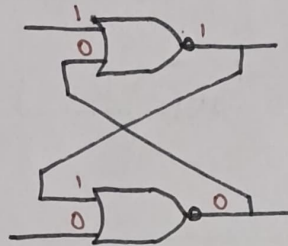
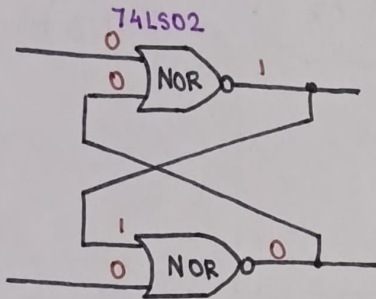
# CLOCK LOGIC





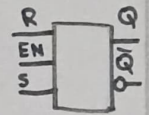
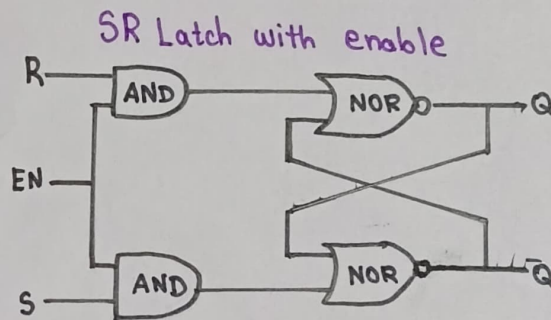
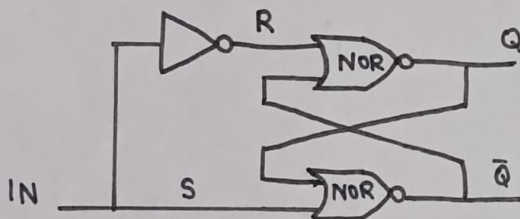
A	B	O/P
0	0	0
0	1	1
1	0	1
1	1	1

→ Turns off only when power is off

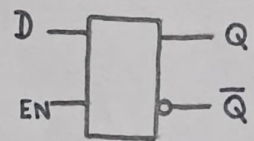
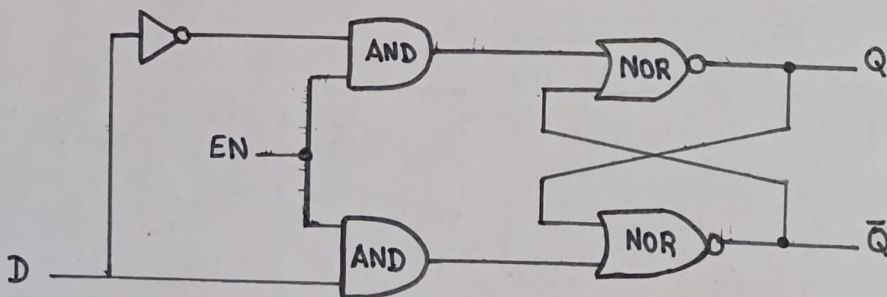


A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

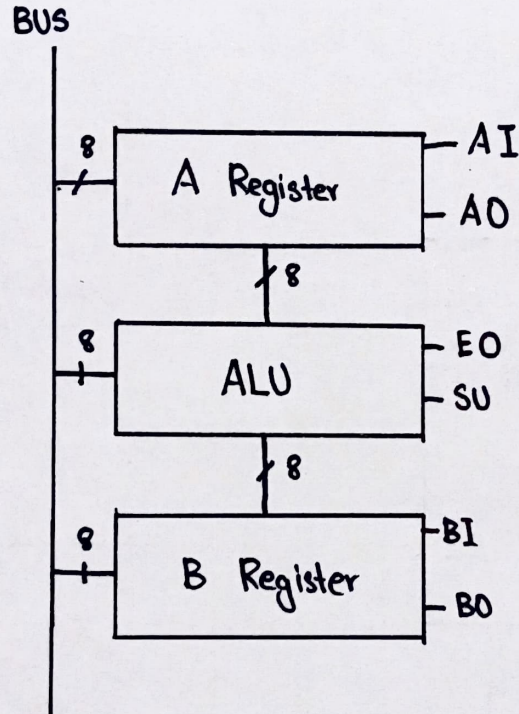
Quad  
NOR



D Latch



# ARITHMETIC LOGIC UNIT (ALU)

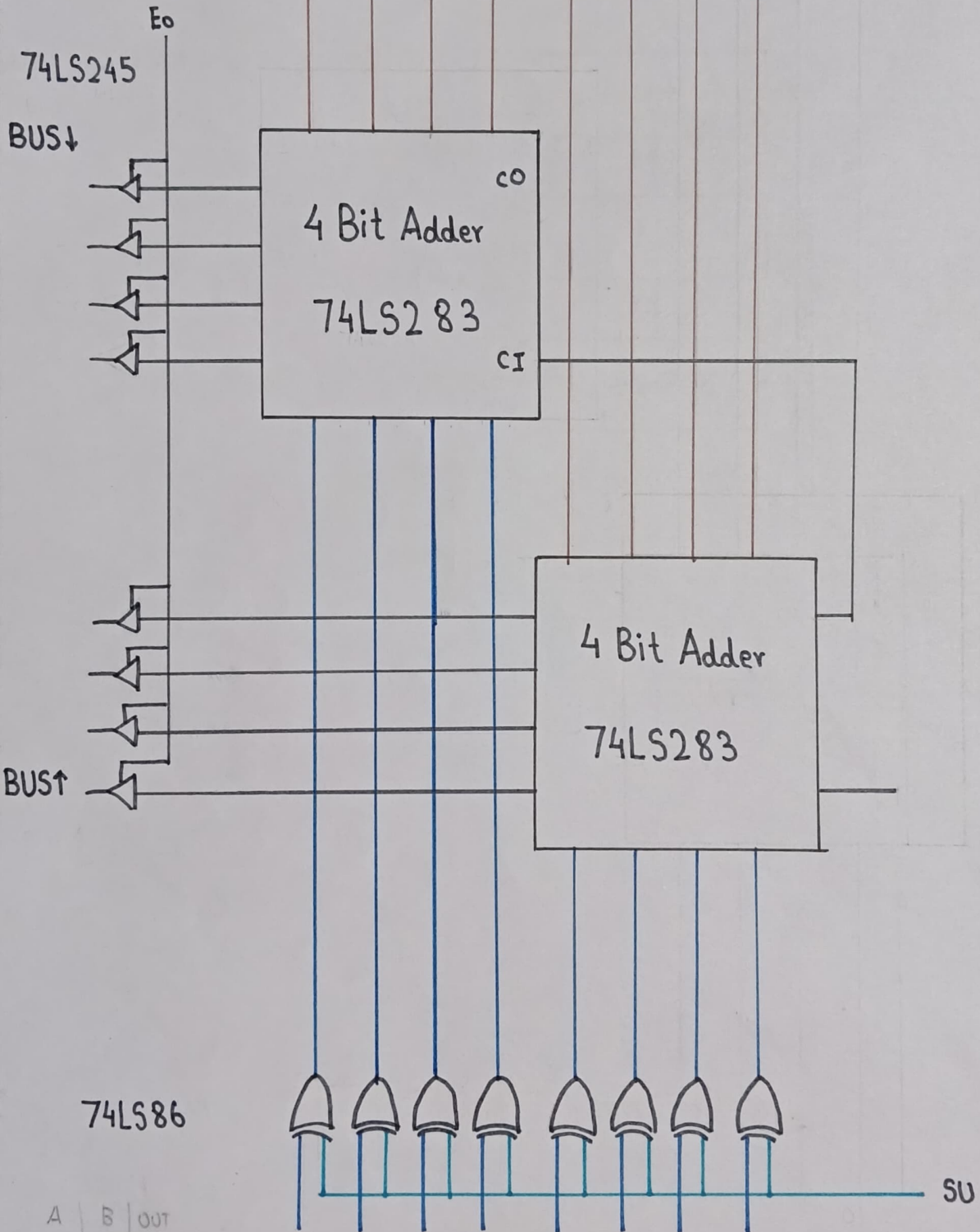


74LS283 4 Bit Binary Adder



# ALU

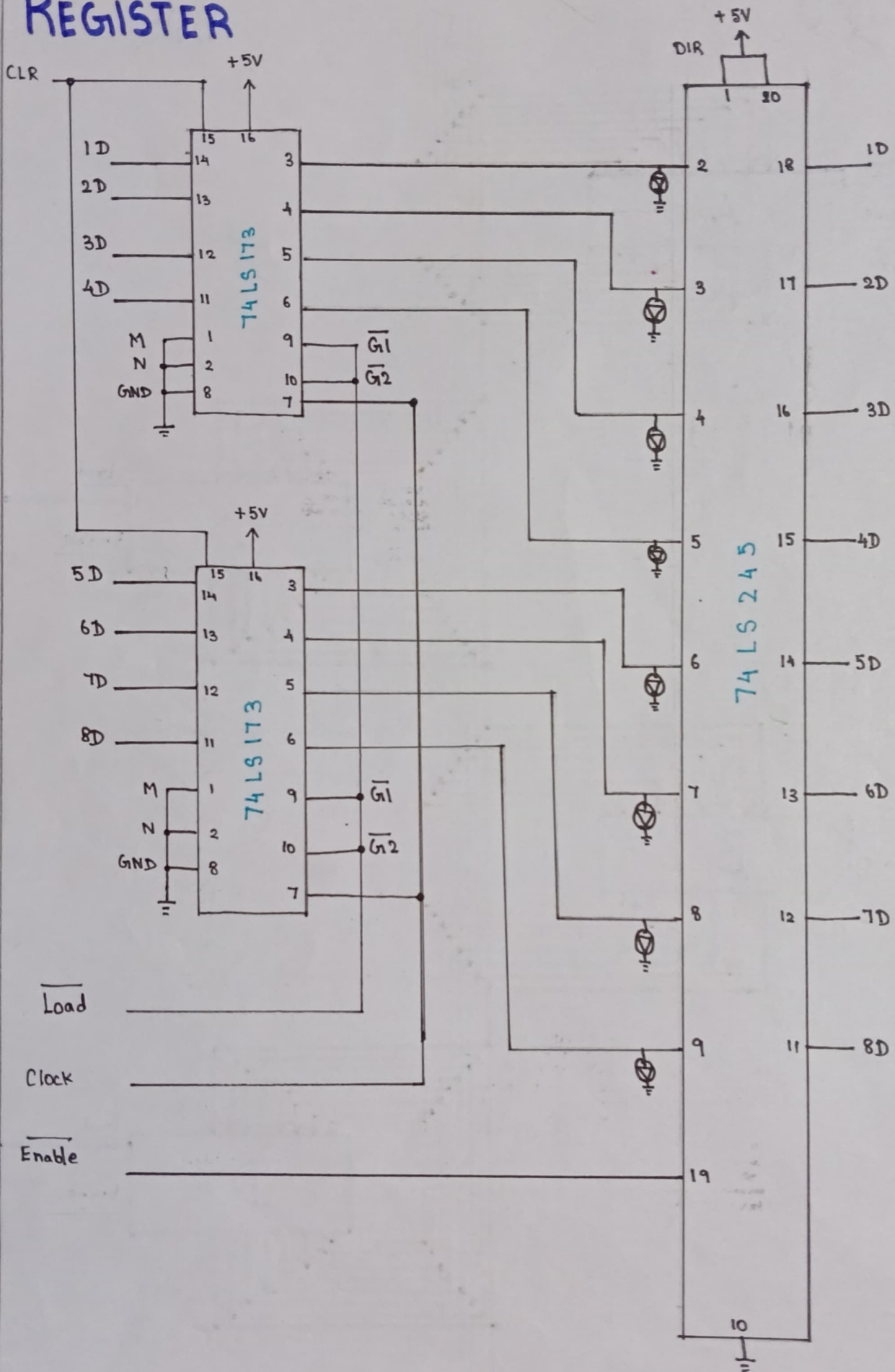
## A Register



A	B	OUT
0	0	0
0	1	1
1	0	1
1	1	0

## B Register

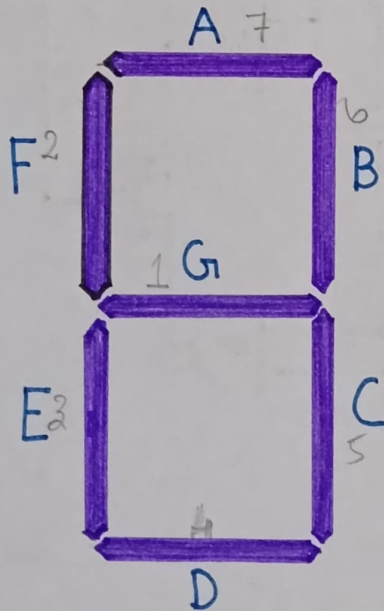
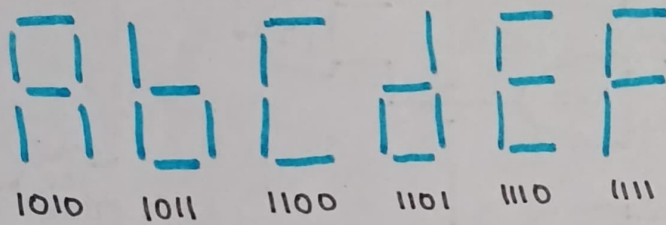
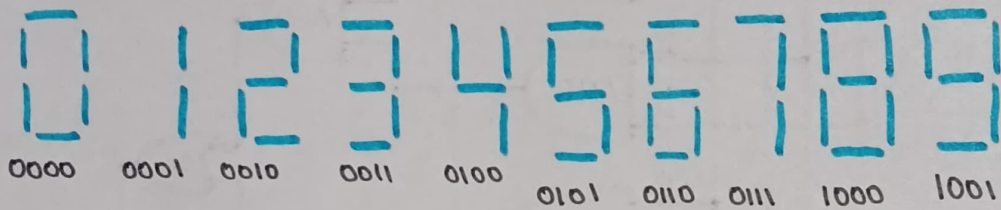
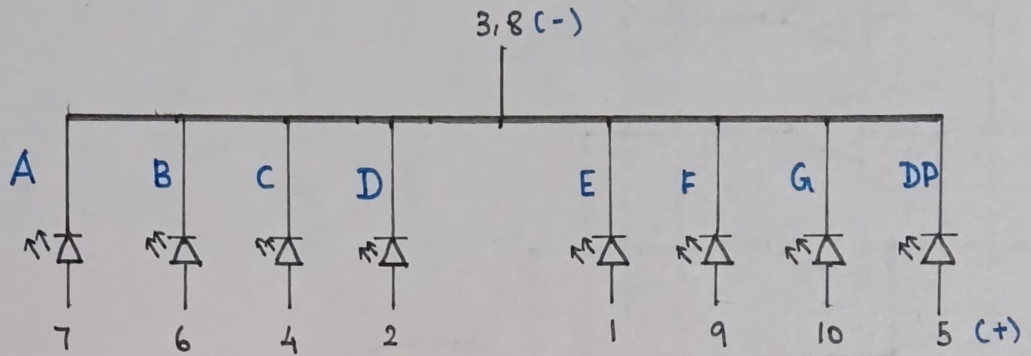
# REGISTER





# 7 SEGMENT

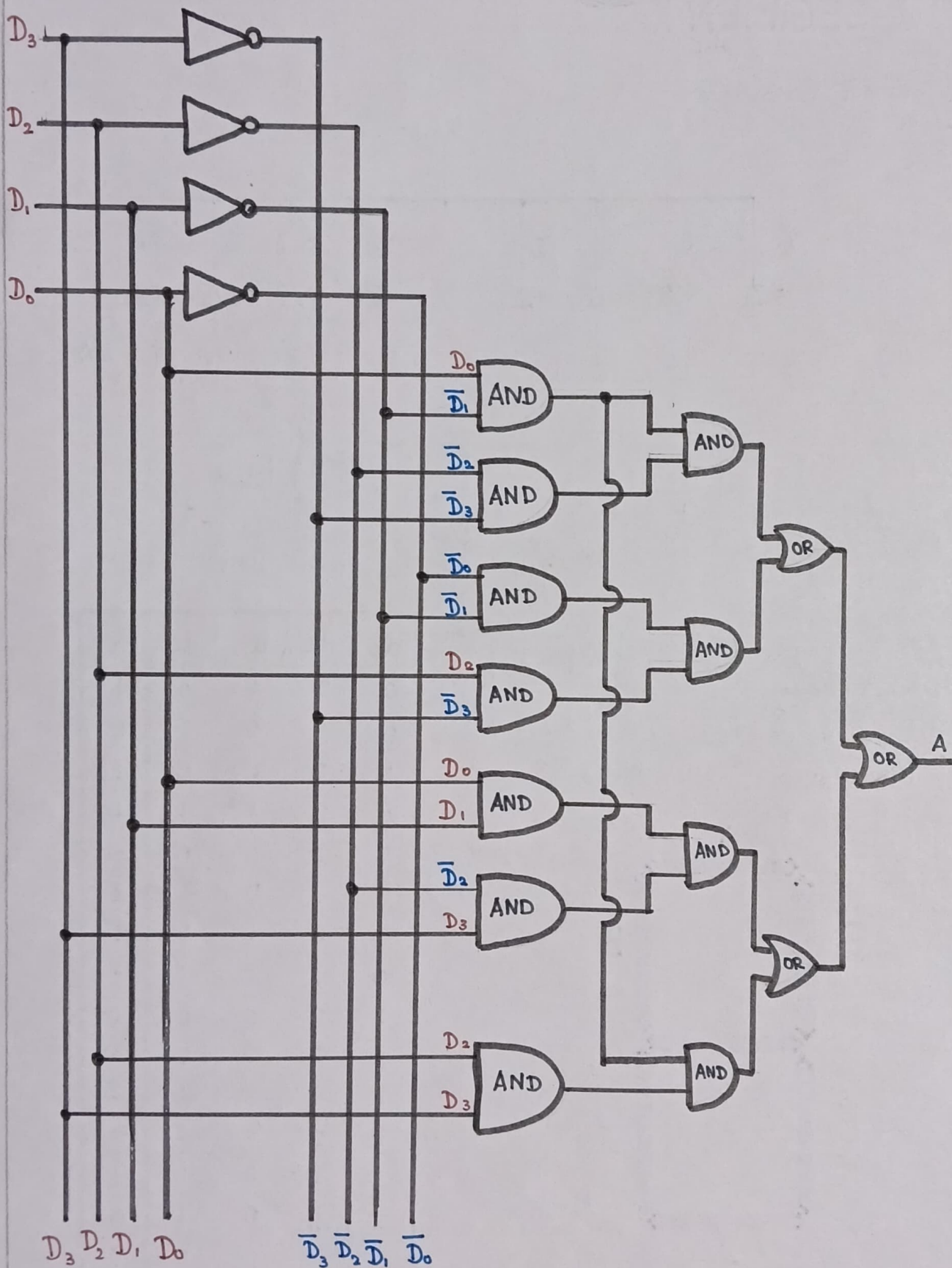
Common Cathode (IS111)



G F B A B

E D 8 C point

d3	d2	d1	d0	a
0	0	0	0	1
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1





$d_3$	$d_2$	$d_1$	$d_0$	A	B	C	D	E	F	G
0	0	0	0	0	0	0	0	0	0	1
0	0	0	1	1	0	0	1	1	1	1
0	0	1	0	0	0	1	0	0	1	0
0	0	1	1	0	0	0	0	1	1	0
0	1	0	0	1	0	0	1	1	0	0
0	1	0	1	0	1	0	0	1	0	0
0	1	1	0	0	1	0	0	0	0	0
0	1	1	1	0	0	0	1	1	1	1
1	0	0	0	0	0	0	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0
1	0	1	0	0	0	0	1	0	0	0
1	0	1	1	1	1	0	0	0	0	0
1	1	0	0	0	1	1	0	0	0	1
1	1	0	1	1	0	0	0	0	1	0
1	1	1	0	0	1	1	0	0	0	0
1	1	1	1	0	1	1	1	0	0	0

# SIGN BIT

1 1 1 1	-7
1 1 1 0	-6
1 1 0 1	-5
1 1 0 0	-4
1 0 1 1	-3
1 0 1 0	-2
1 0 0 1	-1
1 0 0 0	-0
0 0 0 0	0
0 0 0 1	1
0 0 1 0	2
0 0 1 1	3
0 1 0 0	4
0 1 0 1	5
0 1 1 0	6
0 1 1 1	7

$$\begin{array}{r}
 5 \\
 + (-5) \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 0101 \\
 + 1101 \\
 \hline
 10010
 \end{array}$$

# ONES COMPLEMENT

1 0 0 0	-7
1 0 0 1	-6
1 0 1 0	-5
1 0 1 1	-4
1 1 0 0	-3
1 1 0 1	-2
1 1 1 0	-1
1 1 1 1	-0
0 0 0 0	0
0 0 0 1	1
0 0 1 0	2
0 0 1 1	3
0 1 0 0	4
0 1 0 1	5
0 1 1 0	6
0 1 1 1	7

$$\begin{array}{r}
 0101 \quad 5 \\
 + 1010 \quad +(-5) \\
 \hline
 1111 \quad -0+1
 \end{array}
 \quad
 \begin{array}{r}
 0011 \quad 3 \\
 + 1100 \quad +(-3) \\
 \hline
 1111 \quad -0+1
 \end{array}$$

$$\begin{array}{r}
 0101 \quad 5 \\
 + 1100 \quad +(-3) \\
 \hline
 10001 \quad 1+1
 \end{array}
 \quad
 \begin{array}{r}
 0110 \quad 6 \\
 + 1101 \quad +(-2) \\
 \hline
 10011 \quad 3+1
 \end{array}$$