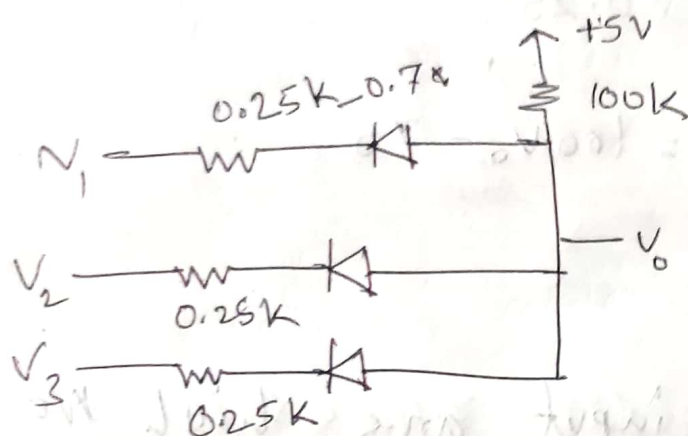


# Home work - 1

## And Gate



Case 1:  $V_1, V_2, V_3 = 0V$ , the  $D_1, D_2, D_3$  all on

$$\frac{5 - V_0}{100} = 3 \times \left( \frac{V_0 - 0.7 - 0}{0.25} \right)$$

$$\Rightarrow V_0 = 0.7V$$

Case 2: Any one input is high, let  $V_1 = 5V$   
the current will flow through the  $D_2$  and  $D_3$

$$\frac{5 - V_0}{100} = 2 \times \left( \frac{V_0 - 0.7}{0.25} \right)$$

$$\Rightarrow 1.25 - 0.25V_0 = 200V_0 - 140$$

$$\therefore V_0 = 0.71V$$

Case 3: Any two input is high, let  $V_1$  and  $V_2 = 5V$  then the current will pass through the  $D_1$ .

$$\frac{5 - V_o}{100} = \frac{V_o - 0.7}{0.25}$$

$$\Rightarrow 1.25 = 0.25 V_o = 100 V_o - 70$$

$$\therefore V_o = 0.711 \text{ V}$$

Case 4:

all the input are high No current flow because all the diodes are off.  
so,  $V_o = 5 \text{ V}$

$V_1$	$V_2$	$V_3$	$V_o$
0	0	0	0.7
5	0	0	0.71
0	5	0	0.71
0	0	5	0.71
5	5	0	0.711
0	5	5	0.711
5	0	5	0.711
5	5	5	5