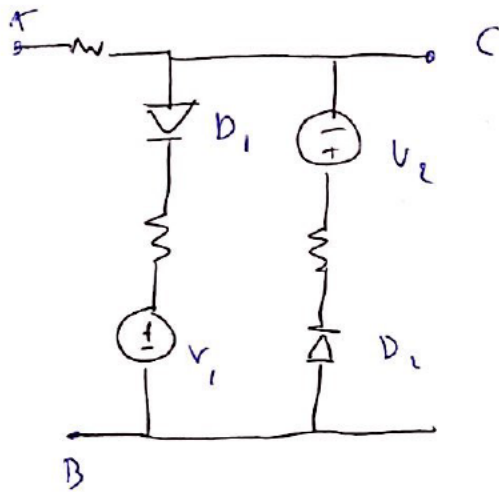


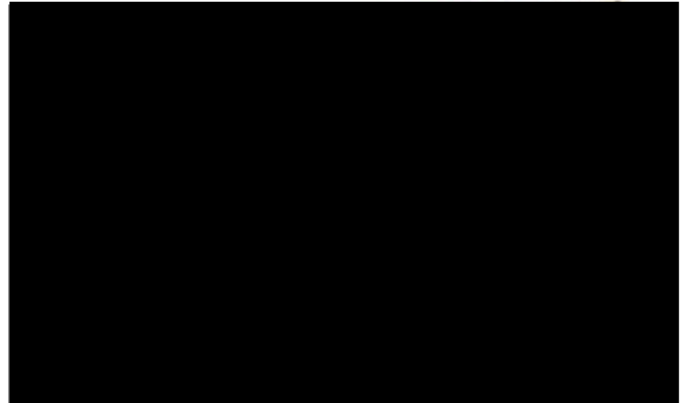
1.



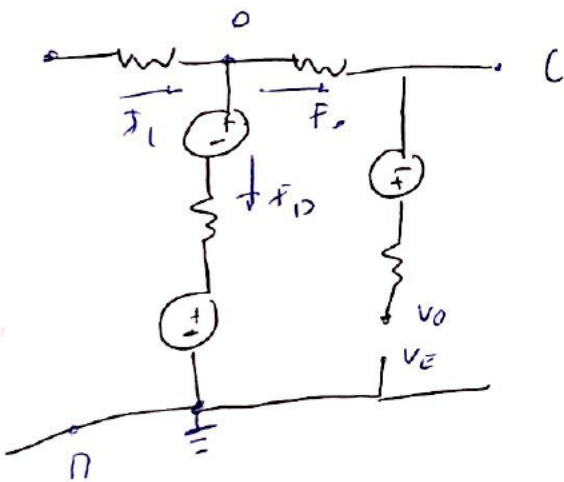
$$V_1 = 7V \quad V_2 = 4V$$

$$V_T = 0.7V \quad R = 100\Omega$$

$$V_i = V_A - V_B \quad V_o = V_C - V_B$$



a)  $D_1$  on  $D_2$  off



$$I_1 = I_0 + I_D$$

$$I_0 = \frac{V_o - V_C}{R}$$

$$I_1 = \frac{V_A - V_o}{R}$$

$$V_o - V_3 = 0.7 - I_D \cdot 100 + 2$$

$$V_o - V_3 = 2.7 - 100 I_D$$

$$I_D = \frac{V_o - V_3 - 2.7}{-100}$$

$$\frac{V_A - V_o}{100} = \frac{V_o - V_C}{100} + \frac{V_o - V_3 - 2.7}{-100}$$

$$V_A - V_o = V_3 - V_C - V_o + V_3 + 2.7$$

$$V_A - V_o = V_3 - V_C + 2.7$$

$$V_A - V_o = V_{out} + 2.7$$

$$V_{in} = V_A - V_3 \quad V_{in} - V_{out} = V_A$$

$$V_{out} = V_C - V_3$$

$$V_A - V_3 = I_1 R + 0.7 + I_D R + 0.7$$

$$V_{in} = I_1 R + 2.7 + I_D R + 0.7$$

$$V_{in} - 2.7 - 2.7 = 0$$

$$I = \frac{V_{in} - 2.7}{200}$$