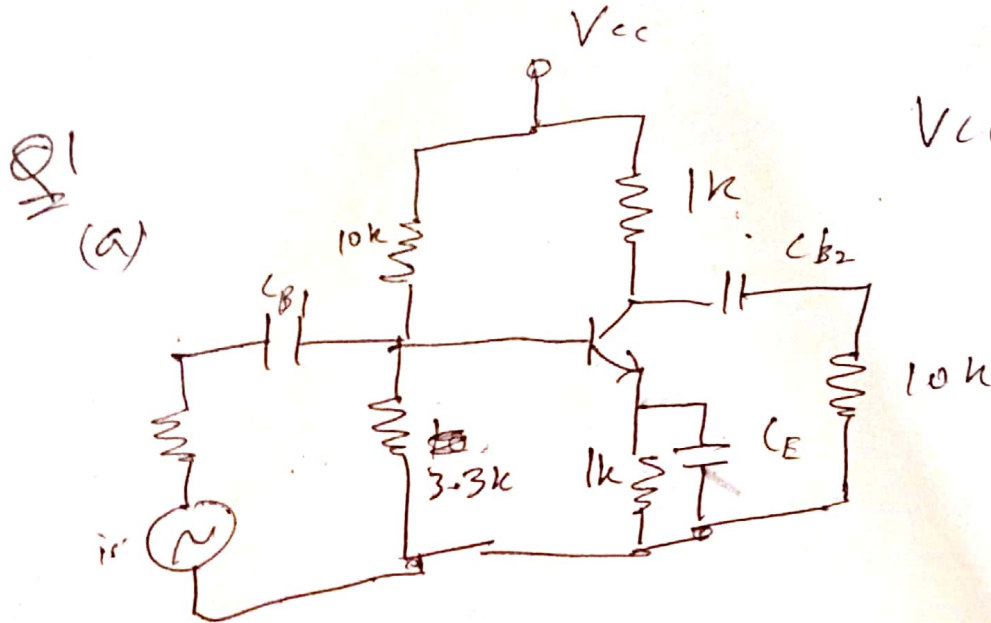
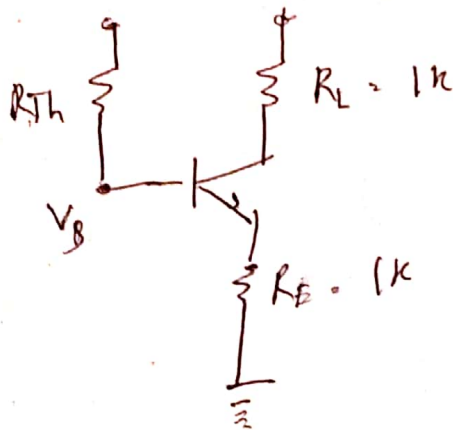


PH3104 C-T-2  
Adwait Noravane  
19MS151



$V_{B2} = \text{Bias voltage} = \frac{V_{CC} R_2}{R_1 + R_2}$

Open at all capacitor : DC equivalent



$$R_{th} = \frac{1}{\frac{1}{10} + \frac{1}{3.3}}$$

$$= 2.48 \text{ k}\Omega$$

$$V_{th} = \frac{R_2}{R_1 + R_2} V_{CC} = \frac{3.3}{10 + 3.3} \times 12$$

$$= 3.096 \text{ V}$$

Now  $I_B = \frac{I_E}{\beta + 1}$

$V_{Y} = ?$ ,  $\beta = ?$

Let  $\beta = 100$ ,  $V_{Y} = 0.7 \text{ V}$

$$I_B = \frac{V_{th} - V_{Y}}{R_{th} + (\beta + 1) R_E}$$

$$= \frac{3.096 - 0.7}{2.48 + 101 \times 1}$$

$$= 0.022 \approx 2.2897 \text{ mA}$$

$$I_C = \frac{100}{101} I_B = \frac{2.2897 \times 100 \times 10^{-3}}{101} = 2.267 \text{ mA.}$$

$$V_B = V_E + 0.7 = 2.9897 \text{ V}$$

$$V_C = 12 - I_C \times 1 = 9.733 \text{ V.}$$

$$V_{BC} = V_B - V_C = -7.34 \text{ V.}$$

$$(b) \quad h_{fe} = 2200, \quad h_{ie} = 2.2k$$

$$h_{oe} = 1.5 \times 10^{-3} \Omega$$

$$h_{re} = 1.2 \times 10^{-4}$$

$$V_{be} = h_{ie} i_b + h_{re} V_{ce}$$

$$V_{ce} = V_{cc} - I_c R_c - I_E R_E$$

~~$$12 = 2.267$$~~

$$i_c = h_{fe} i_b + h_{oe} V_{ce}$$