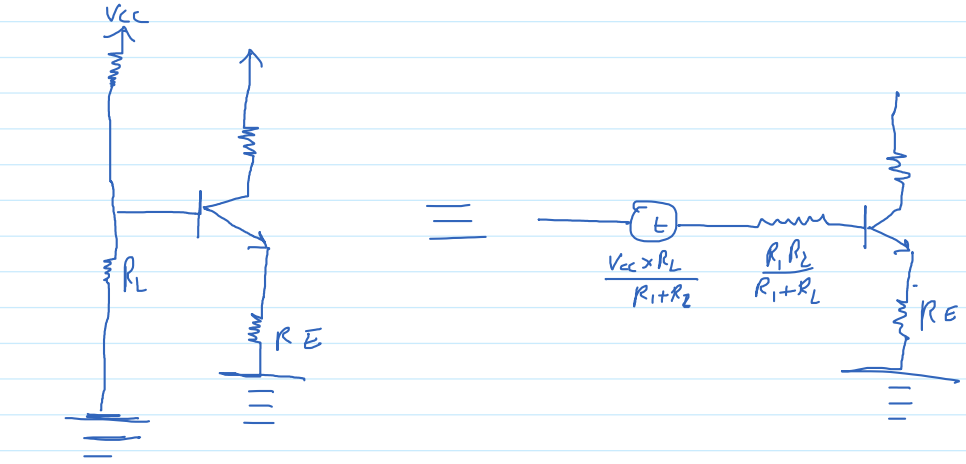
Tut-4 Sheraj, 2020194

01) Given: $V_{CC} = 9V$, $R_1 = 27\,k\Omega$, $R_2 = 15\,k\Omega$, $R_E = 1.2\,k\Omega$, $R_C = 2.2\,k\Omega$,

*) Vsource → short
capacitor → open

AC source →

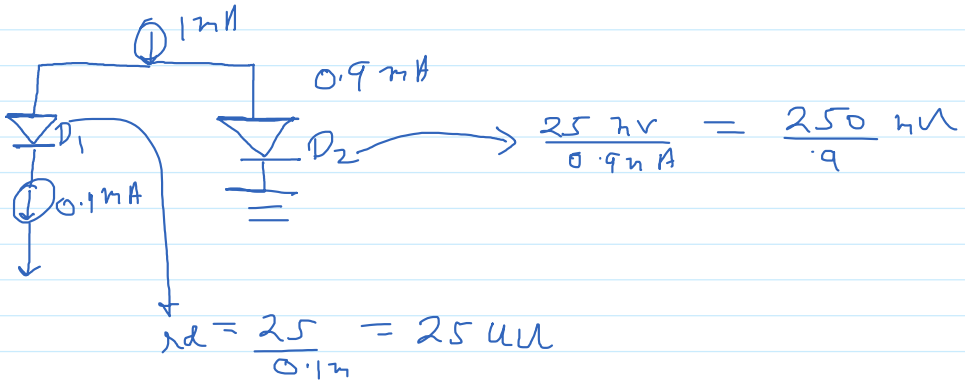


$$I_B = \frac{V_{CC} \times \frac{R_2}{R_1+R_2}}{\frac{R_1 * R_L}{R_1+R_L}} = \frac{V_{CC}}{R_1} = \frac{9}{27K} = \frac{1}{3K}$$

$$I_C = \beta I_B = \frac{100\,mA}{3}$$

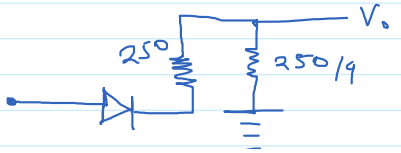
$$I_E = I_C + I_B = \frac{101}{3}\,mA$$

02) for DC analysis



$$r_d = \frac{25}{0.1m} = 25\,\Omega$$

AC analysis



$$V_o = \frac{250/9}{\frac{250}{9}+250} \times V_i \Rightarrow \boxed{V_o = \frac{V_i}{10}}$$