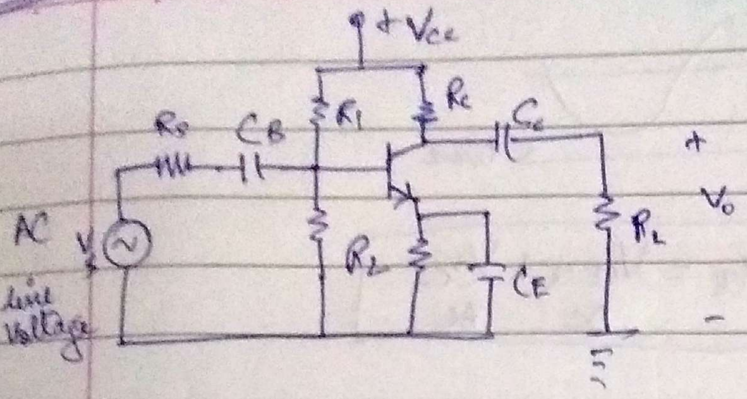
10/08/17



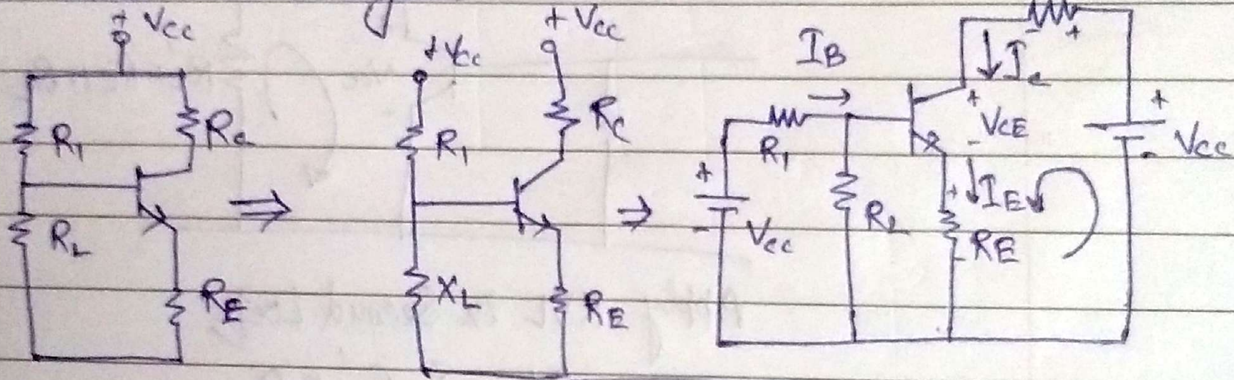
$|X_C| = \frac{1}{2\pi f C}$ [Capacitive Reactance]

DC, $f = 0$

$|X_C| = \frac{1}{2\pi \times 0 \times C} = \frac{1}{0} = \infty$.

[It acts as an open circuit]

DC Load Line Analysis.



$\boxed{I_E = I_B + I_C}$

$\boxed{I_E = \frac{I_C}{\beta} + I_C R_C}$

$\boxed{I_E \simeq I_C \text{ if } \beta = 0}$

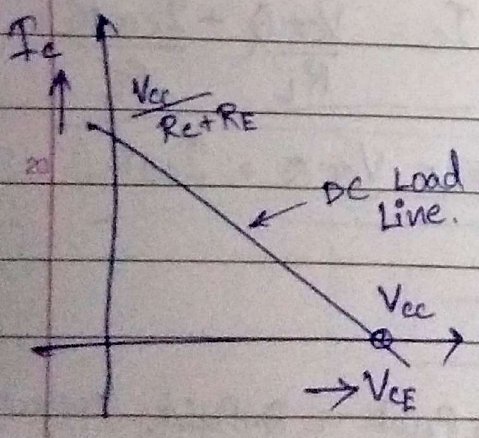
KVL in 2nd Loop.

$-V_{CC} + I_C R_C + I_E R_E = 0$ $+V_{CE}$

or, $-V_{CC} + I_C R_C + V_{CE} + I_E R_E = 0$

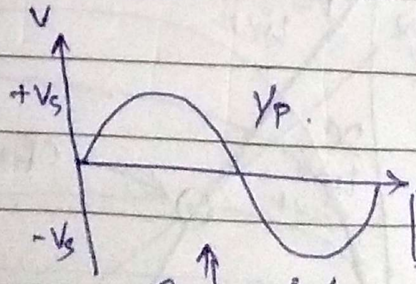
or, $\boxed{I_C(R_E + R_C) + V_{CE} = V_{CC}}$

St. line equation;

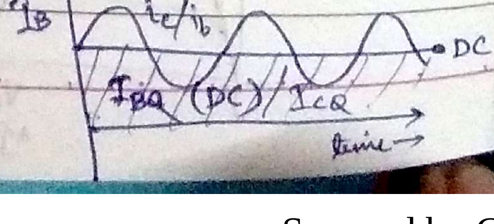


Case 1: $I_C = 0$, $V_{CE} = V_{CC}$

Case 2: $V_{CE} = 0$, $I_C = \frac{V_{CC}}{R_C + R_E}$

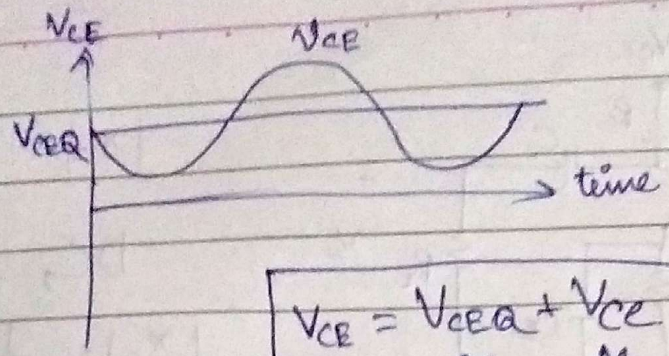


$\boxed{I_B = I_{BQ} + i_b}$



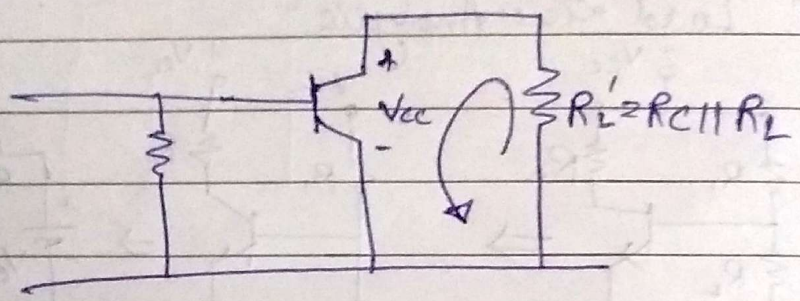
$\boxed{I_B = I_{CQ} + i_c}$

Scanned by CamScanner



$$\boxed{V_{CE} = \underset{DC}{V_{CEQ}} + \underset{AC}{V_{ce}}}$$

AC Load Line Analysis.



Apply KVL in Second Loop.

$$v_{ce} + i_c R_L' = 0.$$

$$(V_{CE} - V_{CEQ}) + (I_c - I_{CQ}) R_L' = 0.$$

$$V_{CE} + I_c R_L' = V_{CEQ} + I_{CQ} \times R_L'$$

Case 1: $V_{CE} = 0$, $\boxed{I_c = \dfrac{V_{CEQ}}{R_L'} + \dfrac{I_{CQ} \cancel{R_L'}}{\cancel{R_L'}}}$

$I_c = 0$; $\boxed{V_{CE} = V_{CEQ} + I_{CQ} R_L'}$