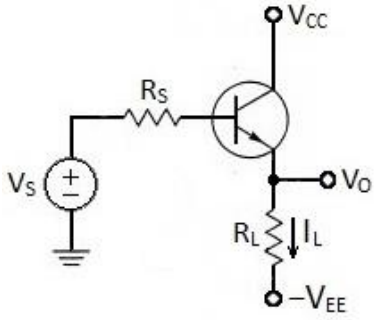
TUTORIAL-VIII

SEM-III, B.Tech(Computer Engineering), SVNIT, Surat

Topic: BJT and its characteristics

1) Derive the expression of transistor currents, take PNP transistor biased in active region.
2) The given relation between α and β, $\alpha = \frac{\beta}{1+\beta}$ then
   β=_____ , 1+β=_____, (1-α)=_____.
3) Draw output characteristics of NPN silicon transistor in CE configuration. Indicate cut off, saturation and active regions.
4) Draw input characteristics of PNP silicon transistor in CE configuration.
5) Draw output characteristics of PNP silicon transistor in CB configuration. Indicate cut off, saturation and active regions.
6) Draw input characteristics of NPN silicon transistor in CB configuration.
7) A silicon transistor is operating in active region with α = 0.975. If emitter current is 2 mA and reverse saturation current is 0.1 uA at a temperature of 25° C, determine the leakage current and the remaining currents of transistor at a temperature of 65° C.
8) Calculate the I_B and I_C for transistor if $I_E = 5\ mA$, $I_{CEO} = 0.15\ mA$ and $\beta = 100$.
9) For the given BJT circuit, calculate the current I_L, if V_S = 5 V, R_S = 430 KΩ, R_L = 2.2 KΩ, β = 100, V_{CC} = 5 V and $-V_{EE}$ = -5 V. Neglect leakage current.



10) Repeat the Q-9 by considering RC = 2.2 KΩ.