Consider a $pnp$ bipolar junction transistor at 300K under active mode biasing with $V_{EB}$ (positive) and $V_{CB}$ (negative), with cross-sectional area $A \text{ cm}^2$. The relevant material parameters for the transistor are as indicated below. Make schematics of the band diagram. You may assume $W=W_B$ in your calculation.

(a) Calculate $I_{Ep}$, $I_{En}$, $I_{Cp}$, $I_{Cn}$, and $I_B$ (Equation only, no calculation necessary).
(b) Calculate the values of the transistor parameters $\gamma$, $\alpha_T$, $\alpha_{dc}$, and $\beta_{dc}$ (Equation only, no calculation necessary).