

A Si pn junction is at equilibrium with one side doped with 10^{17} B atoms/cm³ and the other side with 10^{14} P atoms/cm³. ($\epsilon_0 = 8.85 \times 10^{-14}$ F/cm)

- a) Quantitatively plot vs distance across the junction:
- i- charge density
 - ii- electric field
 - iii- voltage
 - iv- concentrations of majority and minority carriers

Make sure to label the axes with *numbers* (at least show on graph calculated values of x_p , x_n , and max values of each quantity above) and *titles (including units)* in each case.

- b) Quantitatively plot the energy bands of the junction at 0V, -0.6V, and +0.6V.
- c) If the p-side of this junction is 60 μ m thick, and it is illuminated by light with $E > E_g$, sketch (not quantitatively) the I-V characteristics (compare IV characteristics in the dark with in the light).

Note: Use the graph paper provided for answering this problem.