HW6

1. Consider a silicon p⁺n junction. The p-side is heavily doped and the concentration of donors on the n-side is $5 \times 10^{16}$ cm⁻³. Assume an abrupt junction of cross-sectional area $A=10^{-3}$ cm². Also assume the lifetime of minority carriers on the n-side to be 1 µs and the diffusion constant for the holes on the n-side to be 10 cm²/s.
   (a) Clearly the information details on the p⁺ side is not given in this problem. Explain why that information is not necessary for solving part (b).
   (b) Apply a forward bias of 0.5 volts to this diode and calculate the resulting forward current.