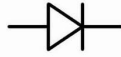


## EE 331 - Homework #2

**Problem 1.** Draw a standard symbol for a p-n junction diode component, like this:



- a. Label the anode and cathode with a “-” and a “+”. At the device level, how does an anode and cathode relate to the **p** and **n** regions?
- b. Draw an arrow labeled  $i_D$  pointing in the direction that Forward Bias current flows through the diode.
- c. What is it called when current flows in the opposite direction of  $i_D$ ?

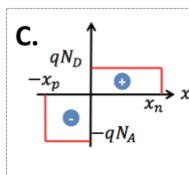
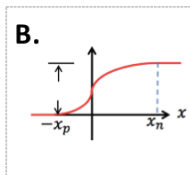
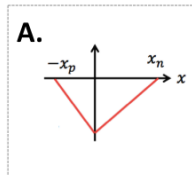
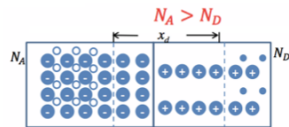
**Problem 2.** Jaeger 3.1

**Problem 3.** Jaeger 3.17

**Problem 4.** Write a couple of paragraphs or so (do not just write down equations, please) to answer the question: What is the difference between **diffusion current** and **drift current**???

**Problem 6.**

Given the following p-n junction, match the graphs A. B. and C. to the corresponding characteristic  $E$ ,  $\varphi$  or  $\rho$ . Please describe what these variables  $E$ ,  $\varphi$  or  $\rho$  mean in a sentence or two, and afterward answer the following question: How does the shape of these three of these graphs relate to 1D Poisson's Equation?



$E$ ,  $\varphi$  or  $\rho$  ???

**Problem 7.** Jaeger 3.28

**Problem 8.** Jaeger 3.33

**Problem 9.** Jaeger 3.40

**Problem 10.** Jaeger 3.72