

Special Problem 3.7-4

1. Which one of the following does **not increase** diffusion current in a p - n junction diode?

- A. Increasing the junction diode voltage.
- B. Increasing the majority particle concentration of the doped silicon.
- C. Increasing diode temperature.
- D. Increasing the barrier voltage.

2. Which one of the following statements about the **depletion region** is **false** ?

- A. The kinetic (i.e., thermal) energy of holes or free-electrons must be sufficiently large to successfully **drift** across this region.
- B. The width of the region can be altered by changing the junction diode voltage.
- C. Positive ions are present in the n -type Silicon.
- D. An electric field is present.
- E. The kinetic (i.e., thermal) energy of holes or free-electrons must be sufficiently large to successfully **diffuse** across this region.

3. Which one of the following statements is **true**?

- A. There are more holes than free-electrons in intrinsic silicon.
- B. There are fewer holes than free-electrons in n -type silicon.
- C. There are no holes in n -type silicon.
- D. There are more free-electrons than holes in p -type silicon.

4. Which of the following statements is **true**?

- A. Increasing the junction diode voltage will increase diffusion current but leave the drift current unchanged.
- B. Increasing the junction diode voltage will decrease diffusion current and decrease drift current.
- C. Increasing the junction diode voltage will increase diffusion current but decrease drift current.
- D. Increasing the junction diode voltage will increase diffusion current and increase drift current.
- E. Increasing the junction diode voltage will decrease diffusion current but leave the drift current unchanged.