Special Problem 3.7-2

1. In a ***p*-type** silicon lattice:

    a) There are holes but **no** free electrons.

    b) There are **some** holes but even **more** free electrons.

    c) There are **some** free electrons but even **more** holes.

    d) There are **equal** numbers of free electrons and holes.

2. In the **depletion region** of a *p-n* junction:

    a) Uncovered positive ions appear in the *p*-type silicon.

    b) Uncovered negative ions appear in the *n*-type silicon

    c) Uncovered positive ions appear in the *n*-type silicon.

    d) **No** uncovered ions appear anywhere in the depletion region.

3. The **electric field** that appears in the depletion region of a *p-n* junction diode:

    a) Causes free electrons to move from the anode to the cathode.

    b) Causes free electrons to move from the cathode to the anode.

    c) Causes holes to move from the anode to the cathode.

4. For a *p-n* junction:

   a) A large **increase** in the barrier voltage will result in a **slight increase** in diffusion current.

   b) A large **decrease** in the barrier voltage will result in a **slight increase** in diffusion current.

   c) A large **decrease** in the barrier voltage will result in a really **large increase** in the diffusion current.

   d) A large **increase** in the barrier voltage will result in **no change** in the diffusion current.

5. The current flowing through a **reversed biased** *p-n* junction consists:

   a) almost entirely of drift current.

   b) almost entirely of diffusion current.

   c) of both diffusion and drift current in significant amounts.

6. **Drift current** is best described as:

   a) charged particles moving from regions of high concentration to regions of low concentration.

   b) charged particles moving from regions of low concentration to regions of high concentration.

   c) charged particles moving due to an electric field.

d) charged particles moving due to entropy.

7. **Increasing** the voltage v_D across a *p-n* junction diode will:

a) increase the barrier voltage.

b) decrease the barrier voltage.

c) not affect the barrier voltage.