# REVIEW QUESTIONS

1. Write short notes about the following items with the aid of formulas and sketches:
   a. Series and parallel resistor arrangements
   b. Voltage and current dividers
   c. Voltage and current sources
   d. Delivered and consumed power
   e. Materials used in electronics.
   f. Semiconductors construction blocks (hint: P-type and n-type)
   g. PN Junction
   h. Forward and reverse biasing of a diode

# Problems

1.1 Ohm's law relates V, I, and R for a resistor. For each of the situations following, find the missing item:

(a) R = 1 kΩ, V = 10 V (b) V = 10 V, I = 1 mA (c) R = 10 kΩ, I = 10 mA (d) R = 100 Ω, V = 10 V

1.2 Ohm's law and the power law for a resistor relate V, I,R, and P, making only two variables independent. For each pair identified below, find the other two:

| | V | I | R | P |
|---|---|---|---|---|
| a | | 10m | 1k | |
| b | 10 | 1m | | |
| c | 10 | | | 1 |
| d | | 10m | | .01 |
| e | | | 1k | 1 |

1.3 If the original resistor is 10 kΩ, what is the value of the shunting resistor needed to reduce the combined value by 1%, 5%, 10%, and 50%? What is the result of shunting a 10-kΩ resistor by 1 MΩ? By 100 kΩ? By 10 kΩ?

1.4 You are given three resistors, each of 10 kΩ, and a 9-V battery whose negative terminal is connected to ground. With a voltage divider using some or all of your resistors, how many positive-voltage sources of magnitude less than 9 V can you design? List them in order, smallest first.

1.5 Design a simple current divider that will reduce the current provided to a 1-kΩ load to 20% of that available from the source.