ETGR 2106 Electric Cets. Homework # 2.

PROBLEMS

SECTION 3.2 Resistance

1. Convert the following to mils:
   a. 0.5 in. b. 0.02 in. c. 1/4 in.
   d. 1 in. e. 0.02 ft f. 0.1 cm
2. Calculate the area in circular mils (CM) of wires having the following diameters:
   a. 0.050 in. b. 0.016 in. c. 0.30 in.
   d. 1 cm e. 0.02 ft f. 0.0042 m
3. The area in circular mils is
   a. 1600 CM b. 900 CM c. 40,000 CM
   d. 625 CM e. 6.25 CM f. 120 CM

   What is the diameter of each wire in inches?
4. What is the resistance of a copper wire 200 ft long and 0.01 in. in diameter ($T = 20°C$)?
5. Find the resistance of a silver wire 50 yd long and 4 mils in diameter ($T = 20°C$).

10. A wire 1000 ft long has a resistance of 0.5 kΩ and an area of 94 CM. Of what material is the wire made ($T = 20°C$)?

15. a. Using Table 3.2, find the resistance of 1800 ft of #8 and #18 AWG wires.
    b. Compare the resistances of the two wires.
    c. Compare the areas of the two wires.
16. a. For the system of Fig. 3.38, the resistance of each line cannot exceed 0.006 Ω, and the maximum current drawn by the load is 110 A. What gage wire should be used?
    b. Repeat (a) for a maximum resistance of 0.003 Ω, $d = 30$ ft, and a maximum current of 110 A.

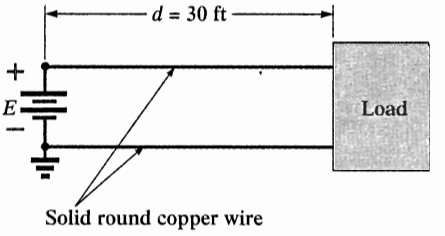

FIG. 3.38
Problem 16.

33. If the resistance between the outside terminals of a linear potentiometer is 10 kΩ, what is its resistance between the wiper (movable) arm and an outside terminal if the resistance between the wiper arm and the other outside terminal is 2.8 kΩ?

36. Find the range in which a resistor having the following color bands must exist to satisfy the manufacturer's tolerance:

	1st band	2nd band	3rd band	4th band
a.	green	blue	yellow	gold
b.	red	red	brown	silver
c.	brown	black	red	—

37. Find the color code for the following 10% resistors:
    a. 220 Ω b. 3300 Ω
    c. 6.8 kΩ d. 2 MΩ

SECTION 3.8 Conductance

40. Find the conductance of each of the following resistances:
    a. 100 Ω b. 4 kΩ c. 2.2 MΩ

    Compare the three results.
41. Find the conductance of 1000 ft of #18 AWG wire made of
    a. copper b. aluminum