Introductory Circuit Analysis (13th Edition)

Step-by-step solution

Step 1 of 2

Given

Conductance of wire $G = 100\,\mathrm{S}$

Let A_1, l_1 are the initial area and length of the wire.

If the area is increased by two third of the initial value,

i.e.

$$A_2 = A_1 + \frac{2}{3}A_1$$
$$= \frac{5}{3}A_1$$

If length is decreased by two third of the initial value,

i.e.

$$l_2 = l_1 - \frac{2}{3}l_1$$
$$= \frac{1}{3}l_1$$

Comment

Step 2 of 2

Therefore, conductance is,

$$G = \frac{A}{\rho l}$$

Where, ρ is constant,

$$\frac{G_1}{G_2} = \left(\frac{A_1}{A_2}\right)\left(\frac{l_2}{l_1}\right)$$
$$\frac{100}{G_2} = \left(\frac{3}{5}\right)\left(\frac{1}{3}\right)$$
$$G_2 = 500\,\mathrm{S}$$
$$\boxed{G_2 = 500\,\mathrm{S}}$$

Comment

Was this solution helpful? 1 0

Chapter 3, Problem 43P

Bookmark

Show all steps: ON

Given, The wiper arm off a linear potentiometer is one-fourth the way around the contact surface. The total resistance =

See solution

To find the conductance s of given resistances. (a) Conductance of 120 We know conductance is a reciprocal resistance. Then, ...

See solution

See more problems in subjects you study