Calculate the resistance of 180 m of silver wire having a cross section of 033mm^2. The resistivity of silver is 1.6×10−8Ωm

a. 112Ω

b. 96Ω

c. 146Ω

d. 75Ω

The resistance of a given object depends primarily on two factors: What material it is made of, and its shape. For a given material, the resistance is inversely proportional to the cross-sectional area. Also, for a given material, the resistance is proportional to the length. The resistance R and conductance G of a conductor of uniform cross section, therefore, can be computed as:

$$R = \frac{\rho l}{S}$$

where ρ – resistivity of material, l – length, S - cross section.

Therefore:

$$R = \frac{1.6 \ 10^{-8} \Omega \ m * 180 \ m}{0.33 \ mm^2} = 8.72 \ \Omega$$

Answer: $R = 8.72 \ \Omega$