

Answer on Question 42653, Electric Circuits

We are given, $l_1:l_2:l_3=3:2:1$ and $m_1:m_2:m_3=1:2:3$.

The formula for resistance in terms of length and cross area is $R=\frac{\rho_1 L}{S}$, where ρ_1 is resistance of wire of unit length and unit cross area. The mass is $m=\rho V=\rho S L$, where ρ is density. From last expression, $S=\frac{m}{\rho L}$. Plugging this into formula for resistance gives $R=\frac{\rho \rho_1 L^2}{m} \sim \frac{L^2}{m}$.

Thus, $R_1 \sim \frac{3^2}{1}$, $R_2 \sim \frac{2^2}{2}=2$, $R_3 \sim \frac{1^2}{3}=\frac{1}{3}$.

Hence, the ratio of resistances is $9:2:\frac{1}{3}$, or $27:6:1$.

The answer is A).