

## 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  $\rho_1$  is resistance of wire of unit length and unit cross area. The mass is  $m=\rho V=\rho S L$  , where  $\rho$  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).