

### Question 36694

The thermal resistance of metal as a function of temperature is linear:

$$R(t) = R_0(1 + \alpha t) ,$$

where  $R_0$  is temperature at zero degrees and  $\alpha$  is a coefficient.

Using given data at zero temperature, obtain  $R_0 = 4 \text{ Ohm}$  . Using resistance at 100 degrees, obtain

$$10 = 4(1 + \alpha \cdot 100) \Rightarrow \alpha = 1.5 \cdot 10^{-2} \frac{1}{\text{Cels}} .$$
 Hence, resistance for current metal as a function of

temperature is  $R(t) = 4(1 + 1.5 \cdot 10^{-2} t)$  .

Plugging in  $t = 45$  , obtain  $R(45) = 6.7 \text{ Ohm}$  .