Answer on Question #37816 - Physics – Other

A 25 watt bulb and a 100 watt bulb, Which bulb has a larger resistance?

Solution:
Formula for the power of the bulbs:

$$P_1 = \frac{U^2}{R_1} = 25 \text{ watt} \qquad (1)$$

$$P_2 = \frac{U^2}{R_2} = 100 \text{ watt} \qquad (2)$$

$(2) \div (1)$:

$$\frac{100 \text{ watt}}{25 \text{ watt}} = \frac{U^2}{R_1} \cdot \frac{R_2}{U^2} \Rightarrow$$

$$\frac{R_2}{R_1} = 4$$

$$R_2 = 4R_1$$

Answer: resistance of 100-watt bulb is 4 times larger than resistance of 25 watts-watt bulb.