

Show formulas, substitutions, answers (in spaces provided) and units!

A carbon-core resistor consists of a carbon rod having a length of 8.75 mm, a diameter of 0.0250 mm and a resistivity of $3500 \times 10^{-8} \Omega \text{m}$.



1. What is the value of the cross-sectional area of the carbon rod. Be sure your answer is in m^2 .

1. _____

2. What is the resistance of the carbon rod?

2. _____

3. If a current of 1.75 A passes through the resistor, what is the voltage across the resistor?

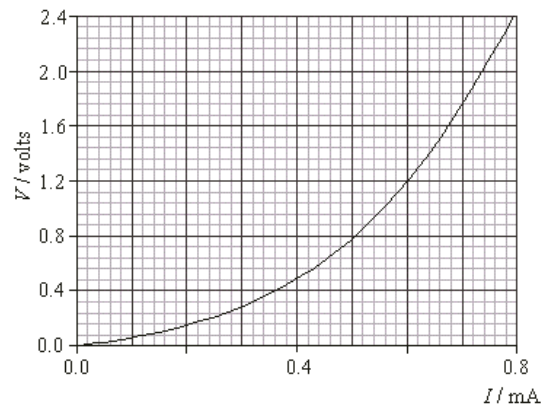
3. _____

An unknown material has the V-I characteristics shown in the graph.

4. What is the resistance of the material when the current is 0.2 mA? 4. _____

5. What is the resistance of the material when the current is 0.7 mA? 5. _____

6. What is the resistance of the material when the voltage is 1.2 V? 6. _____



7. Is this material ohmic? Explain. _____.

A voltmeter records the displayed potential difference when the leads are placed across a 2200Ω resistor.

8. What is the current passing through the resistor? 8. _____

9. How much charge passes through the resistor in exactly 1.5 minutes?

9. _____



10. How much electrical energy is required to pass the charge you found in (8) through the resistor?

10. _____

11. What is the fractional error in the voltage measurement?

11. _____

A filament lamp has a rating of 1.50 W. While the bulb is lit, the meter displays the value shown.

12. What is the power dissipation of the lamp? 12. _____

13. What is the current in the lamp? 13. _____

14. What is the resistance of the lamp? 14. _____

