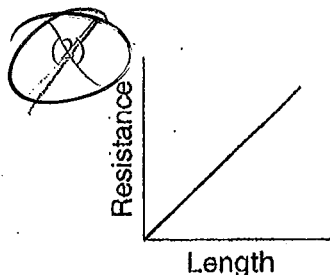
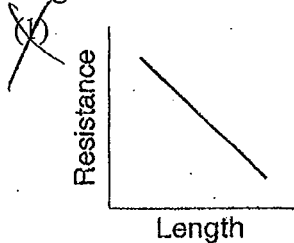


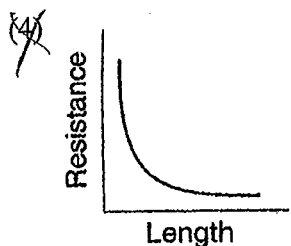
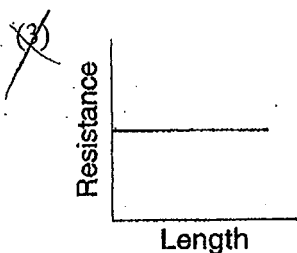
pg 3 solution

$$R = \frac{\rho L}{A} \rightarrow \rho = \frac{RA}{L} = \frac{0.125 \Omega \times 8.23 \times 10^{-6} \text{ m}^2}{0.686 \text{ m}}$$

1. A copper wire is part of a complete circuit through which current flows. Which graph best represents the relationship between the wire's length and its resistance?



$$\uparrow R = \frac{\rho L}{A}$$



2. If the diameter of a wire were decreased, its electrical resistance would

~~(1)~~ decrease

~~(3)~~ remain the same

~~(2)~~ increase

$$\uparrow R = \frac{\rho L}{A}$$

3. The resistance of a 60.-watt lightbulb operated at 120 volts is approximately

~~(1)~~ 720  $\Omega$

~~(3)~~ 120  $\Omega$

~~(2)~~ 240  $\Omega$

~~(4)~~ 60.  $\Omega$

$$P = \frac{V^2}{R} \rightarrow R = \frac{V^2}{P} = \frac{(120\text{V})^2}{60\text{W}}$$

4. A 0.686-meter-long wire has a cross-sectional area of  $8.23 \times 10^{-6} \text{ meter}^2$  and a resistance of 0.125 ohm at  $20^\circ \text{ Celsius}$ . This wire could be made of

~~(1)~~ aluminum

~~(3)~~ nichrome

~~(2)~~ copper

~~(4)~~ tungsten

5. A 150-watt lightbulb is brighter than a 60.-watt lightbulb when both are operating at a potential difference of 110 volts. Compared to the resistance of and the current drawn by the 150-watt lightbulb, the 60.-watt lightbulb has

~~(1)~~ less resistance and draws more current

~~(2)~~ less resistance and draws less current

~~(3)~~ more resistance and draws more current

~~(4)~~ more resistance and draws less current

$$P = \frac{V^2}{R}$$

$$\uparrow R = \frac{V^2}{P}$$

6. An electrical appliance draws 9.0 amperes of current when connected to a 120-volt source of potential difference. What is the total amount of power dissipated by this appliance?

~~(1)~~ 13 W

~~(3)~~ 130 W

~~(2)~~ 110 W

~~(4)~~ 1100 W

$$P = IV = (9\text{A})(120\text{V})$$

7. In a series circuit containing two lamps, the battery supplies a potential difference of 1.5 volts. If the current in the circuit is 0.10 ampere, at what rate does the circuit use energy?

~~(1)~~ 0.015 W

~~(3)~~ 1.5 W

~~(2)~~ 0.15 W

~~(4)~~ 15 W

$$P = IV = (1.5\text{V})(0.1\text{A})$$

8. An electric drill operating at 120. volts draws a current of 3.00 amperes. What is the total amount of electrical energy used by the drill during 1.00 minute of operation?

~~(1)~~  $2.16 \times 10^4 \text{ J}$

~~(3)~~  $3.60 \times 10^2 \text{ J}$

~~(2)~~  $2.40 \times 10^3 \text{ J}$

~~(4)~~  $4.00 \times 10^1 \text{ J}$

$$W = IVt$$

9. A 4.50-volt personal stereo uses 1950 joules of electrical energy in one hour. What is the electrical resistance of the personal stereo?

~~(1)~~ 433 Ohms

~~(3)~~ 37.4 Ohms

~~(2)~~ 96.3 Ohms

~~(4)~~ 0.623 Ohms

3600s

$$W = \frac{V^2}{R} t$$

$$R = \frac{V^2 t}{W}$$