Name: _____

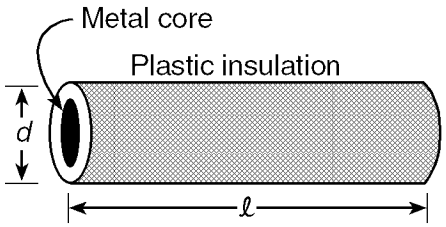
Resistivity and Ohm's Law Worksheet

1) What is the current in an electric circuit if 10. coulombs of charge are transferred through the circuit in 5.0 seconds?

2) During a thunderstorm, a lightning strike transfers 12 coulombs of charge in 2.0×10^{-3} second. What is the average current produced in this strike?

3) A wire carries a current of 2.0 amperes. How many electrons pass a given point in this wire in 1.0 second?

4) Plastic insulation surrounds a wire having diameter d and length ℓ as shown below.



A decrease in the resistance of the wire would be produced by an increase in the

A) length ℓ of the wire
B) diameter d of the wire
C) temperature of the wire
D) thickness of the plastic insulation

5) A current of 3.0 amperes is flowing in a circuit. How much charge passes a given point in the circuit in 30. seconds?

A) 90. C B) 0.10 C C) 10. C D) 33 C

6) A manufacturer recommends that the longer the extension cord used with an electric drill, the thicker (heavier gauge) the extension cord should be. This recommendation is made because the resistance of a wire varies

A) directly with length and inversely with cross-sectional area
B) inversely with length and directly with cross-sectional area
C) inversely with both length and cross-sectional area
D) directly with both length and cross-sectional area

7) A complete circuit is left on for several minutes, causing the connecting copper wire to become hot. As the temperature of the wire increases, the electrical resistance of the wire

A) decreases B) remains the same C) increases

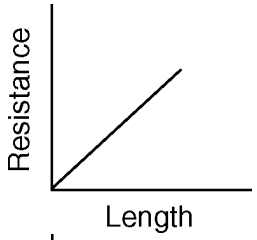
8) A 0.500-meter length of wire with a cross-sectional area of 3.14×10^{-6} meters squared is found to have a resistance of 2.53×10^{-3} ohms. According to the resistivity chart, the wire could be made of

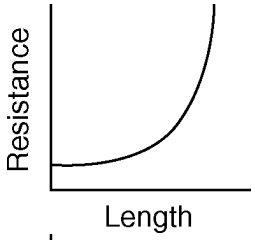
A) silver B) aluminum C) copper D) nichrome

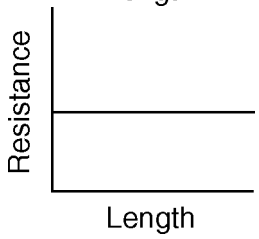
9) Pieces of aluminum, copper, gold, and silver wire each have the same length and the same cross-sectional area. Which wire has the *lowest* resistance at 20° C?

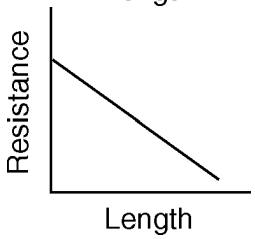
A) gold B) aluminum C) copper D) silver

10) Which graph *best* represents the relationship between resistance and length of a copper wire of uniform cross-sectional area at constant temperature?

A) 

C) 

B) 

D) 

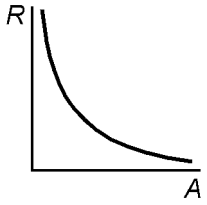
11) The table below lists various characteristics of two metallic wires, *A* and *B*.

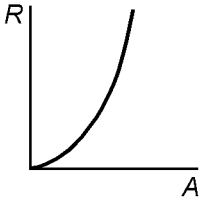
Wire	Material	Temperature (°C)	Length (m)	Cross-Sectional Area (m^2)	Resistance (Ω)
A	silver	20.	0.10	0.010	*R*
B	silver	20.	0.20	0.020	???

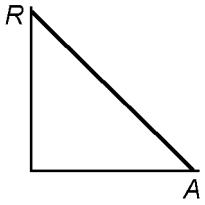
If wire *A* has resistance *R*, then wire *B* has resistance

A) *R* B) 4*R* C) $\frac{R}{2}$ D) 2*R*

12) Several pieces of copper wire, all having the same length but different diameters, are kept at room temperature. Which graph *best* represents the resistance, *R*, of the wires as a function of their cross-sectional areas, *A*?

A) 

B) 

C) 

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