8. How much electrical potential energy is stored in the capacitor?

F. 2.00×10^{-4} J
G. 4.00×10^{-4} J
H. 2.00×10^{-6} J
J. 4.00×10^{-6} J

9. How long does it take 5.0 C of charge to pass through a given cross section of a copper wire if $I = 5.0$ A?

A. 0.20 s
B. 1.0 s
C. 5.0 s
D. 25 s

10. A potential difference of 12 V produces a current of 0.40 A in a piece of copper wire. What is the resistance of the wire?

F. 4.8 Ω
G. 12 Ω
H. 30 Ω
J. 36 Ω

11. How many joules of energy are dissipated by a 50.0 W light bulb in 2.00 s?

A. 25.0 J
B. 50.0 J
C. 100 J
D. 200 J

12. How much power is needed to operate a radio that draws 7.0 A of current when a potential difference of 115 V is applied across it?

F. 6.1×10^{-2} W
G. 2.3×10^{0} W
H. 1.6×10^{1} W
J. 8.0×10^{2} W

SHORT RESPONSE

13. Electrons are moving from left to right in a wire. No other charged particles are moving in the wire. In what direction is the conventional current?

14. What is drift velocity, and how does it compare with the speed at which an electric field travels through a wire?

15. List four factors that can affect the resistance of a wire.

EXTENDED RESPONSE

16. A parallel-plate capacitor is made of two circular plates, each of which has a diameter of 2.50×10^{-3} m. The plates of the capacitor are separated by a space of 1.40×10^{-4} m.

a. Assuming that the capacitor is operating in a vacuum and that the permittivity of a vacuum ($\varepsilon_0 = 8.85 \times 10^{-12}$ $C^2/N \cdot m^2$) can be used, determine the capacitance of the capacitor.

b. How much charge will be stored on each plate of the capacitor when the capacitor's plates are connected across a potential difference of 0.12 V?

c. What is the electrical potential energy stored in the capacitor when fully charged by the potential difference of 0.12 V?

d. What is the potential difference between a point midway between the plates and a point that is 1.10×10^{-4} m from one of the plates?

e. If the potential difference of 0.12 V is removed from the circuit and the circuit is allowed to discharge until the charge on the plates has decreased to 70.7 percent of its fully charged value, what will the potential difference across the capacitor be?

Test TIP If at any point while taking a test you do not clearly understand the directions or the wording of a question, raise your hand and ask for help.