Electricity Review
Answers

1. A
2. D
3. A
4. D
5. B
6. A
7. C
8. B
9. C
10. D
11. A
12. D
13. A
14. A
15. A
16. A
17. B
18. A
19. C
20. C
21. B

22. 6.0 C of charge pass through a wire in 20.0 s. Calculate the current in the wire.

$$I = \frac{Q}{t} = \frac{6.0\,C}{20.0\,s} = 0.3\,A$$

23. A current of 0.5 A flows through a wire. How much charge passes through in 1.0 minute?

$$I = \frac{Q}{t} \qquad t = 1.0\,\text{minute} = 60\,s$$

$$Q = It = .5\,A(60\,s) = 30\,C.$$

24. Electrons with a charge of 1.6×10^{-19} C have an electrical potential of 12 V. Calculate the energy of each electron.

$$V = \frac{E}{q}$$

$$E = qV = (1.6 \times 10^{-19}\,C)\,12\,V = 1.92 \times 10^{-18}\,J$$

25. The charges flowing in the circuit have 8.0×10^{-19} J of energy. Given a charge of 1.6×10^{-19} C, calculate the electric potential of the charges.

$$V = \frac{E}{q} = \frac{8.0 \times 10^{-19}\,J}{1.6 \times 10^{-19}\,C} = 5\,V$$

26. The label on a hairdryer says that is uses 100W of power. If the hairdryer is used for 10 minutes, how much energy is transformed?

$$P = \frac{E}{t} \qquad t = 10\,\text{minutes} = 10(60) = 600\,s$$

$$E = Pt = 100\,W(600\,s) = 60000\,J$$

or

$$6 \times 10^{4}\,J$$

27. A TV uses 10 kWh per month. If electricity costs 9 ¢/kWh, how much would it cost per year?

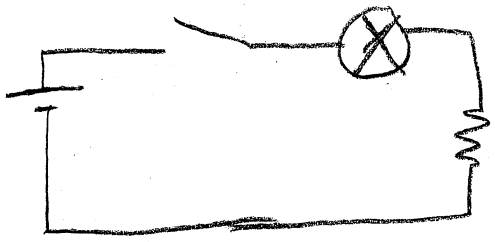
Cost = 10 kWh($0.09) = $0.90/month

= $10.80/year

28. An oven uses 3600W of power to bake. How much does it cost to use the oven for 30 minutes using a cost of 9 ¢/kWh?

$$\text{Cost} = \frac{(3600\text{W})(30\times 60)}{3.6\times 10^6}(\$0.09) = \$0.16$$

29. Draw a schematic diagram showing a 9.0 V battery, a switch, a light bulb, and a resistor connected in series.



30. Draw a schematic diagram showing a 9.0 V battery connected to a resistor and a light bulb in parallel.