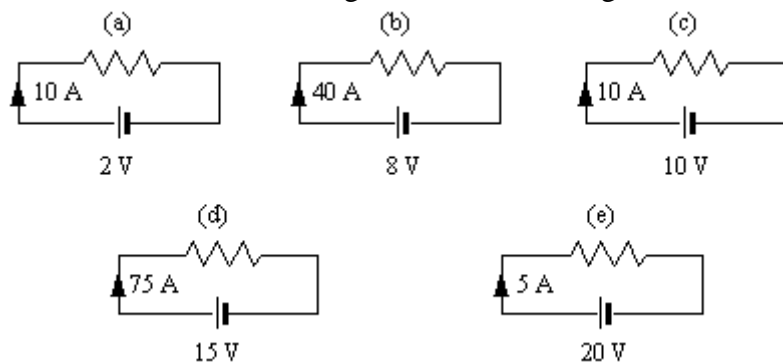


- How many electrons flow through a battery that delivers a current of 3.0 A for 12 s?
 - 4
 - 36
 - 4.8×10^{15}
 - 6.4×10^{18}
 - 2.2×10^{20}
- The potential difference across the ends of a wire is doubled in magnitude. If Ohm's law is obeyed, which one of the following statements concerning the resistance of the wire is true?
 - The resistance is one half of its original value.
 - The resistance is twice its original value.
 - The resistance is not changed.
 - The resistance increases by a factor of four.
 - The resistance decreases by a factor of four.

- Which one of the following circuits has the largest resistance?



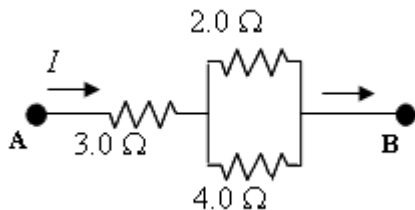
- When a light bulb is connected to a 4.5 V battery, a current of 0.16 A passes through the bulb filament. What is the resistance of the filament?
 - $440\ \Omega$
 - $28\ \Omega$
 - $9.3\ \Omega$
 - $1.4\ \Omega$
 - $0.72\ \Omega$
- Determine the length of a copper wire that has a resistance of $0.172\ \Omega$ and cross-sectional area of $1 \times 10^{-4}\text{ m}^2$. The resistivity of copper is $1.72 \times 10^{-8}\ \Omega \cdot \text{m}$.
 - 0.1 m
 - 10 m
 - 100 m
 - 1000 m
 - 10 000 m

6. Complete the following statement: The unit *kilowatt • hour* measures
- current.
 - energy.
 - power.
 - potential drop.
 - voltage.
7. A 40-W and a 60-W light bulb are designed for use with the same voltage. What is the ratio of the resistance of the 60-W bulb to the resistance of the 40-W bulb?
- 1.5
 - 0.67
 - 2.3
 - 0.44
 - 3.0
8. A computer monitor uses 2.0 A of current when it is plugged into a 120 V outlet. The monitor is never turned off. What is the yearly cost of operating the monitor if the cost of electricity is \$0.12/kWh?
- \$14
 - \$21
 - \$98
 - \$170
 - \$250
9. A 4-A current is maintained in a simple circuit with a total resistance of 2 Ω . How much energy is dissipated in 3 seconds?
- 3 J
 - 6 J
 - 12 J
 - 24 J
 - 96 J
10. Which one of the following statements concerning resistors **in series** is true?
- The voltage across each resistor is the same.
 - The current through each resistor is the same.
 - The power dissipated by each resistor is the same.
 - The rate at which charge flows through each resistor depends on its resistance.
 - The total current through the resistors is the sum of the current through each resistor.
11. Three resistors, 50- Ω , 100- Ω , 200- Ω , are connected in series in a circuit. What is the equivalent resistance of this combination of resistors?
- 350 Ω
 - 250 Ω
 - 200 Ω
 - 120 Ω
 - 29 Ω

12. Two $15\text{-}\Omega$ and three $25\text{-}\Omega$ light bulbs and a 24 V battery are connected in a series circuit. What is the current that passes through each bulb?
- 0.23 A
 - 0.51 A
 - 0.96 A
 - 1.6 A
 - The current will be 1.6 A in the $15\text{-}\Omega$ bulbs and 0.96 A in the $25\text{-}\Omega$ bulbs.
13. Three resistors, $6.0\text{-}\Omega$, $9.0\text{-}\Omega$, $15\text{-}\Omega$, are connected in parallel in a circuit. What is the equivalent resistance of this combination of resistors?
- $30\ \Omega$
 - $10\ \Omega$
 - $3.8\ \Omega$
 - $2.9\ \Omega$
 - $0.34\ \Omega$
14. A non-ideal battery has a 6.0-V *emf* and an internal resistance of $0.6\ \Omega$. Determine the terminal voltage when the current drawn from the battery is 1.0 A .
- 5.0 V
 - 6.0 V
 - 5.4 V
 - 6.6 V
 - 5.8 V

Use the following to answer questions 15-16:

Three resistors are connected as shown in the figure. The potential difference between points **A** and **B** is 26 V .



15. What is the equivalent resistance between the points **A** and **B**?
- $3.8\ \Omega$
 - $4.3\ \Omega$
 - $5.1\ \Omega$
 - $6.8\ \Omega$
 - $9.0\ \Omega$
16. How much current flows through the $2\text{-}\Omega$ resistor?
- 2.0 A
 - 4.0 A
 - 6.0 A
 - 8.7 A
 - 10.0 A