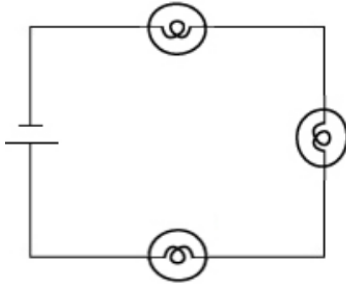


AP Physics 1 – Algebra-Based: Unit 9 DC Circuits Practice Test

Question 1:



This picture is an electrical circuit. This circuit is a series circuit because:

- A. It has 3 light bulbs.
- B. It uses a single battery.
- C. The same current flows through all three light bulbs.
- D. The electrical current is divided between the three light bulbs.

Question 2:

Which best describes a parallel circuit?

- A. Electricity flows along one pathway.
- B. Electricity flows along more than one pathway.
- C. The flow of electricity comes from one source.
- D. The flow of electricity comes from more than one source.

Question 3:

As the resistance of a circuit increases, the current will...

- A. increase
- B. decrease
- C. stay the same

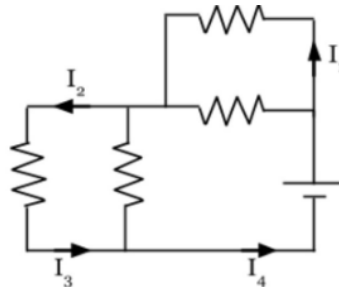
Question 4:

In a parallel circuit which of the following is the same value throughout the circuit?

- A. Voltage
- B. Resistance

- C. Current
- D. Charge

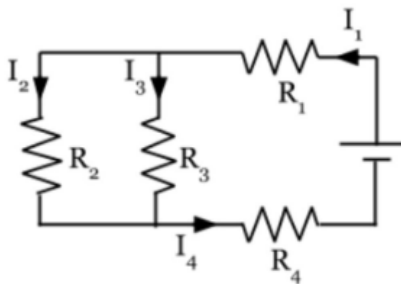
Question 5:



Four identical resistors are connected to a battery as seen above. How do the currents at the labeled locations compare?

- A. $I_1 = I_2 > I_3 = I_4$
- B. $I_4 = I_1 > I_2 = I_3$
- C. $I_1 > I_2 = I_3 > I_4$
- D. $I_4 > I_1 = I_2 = I_3$

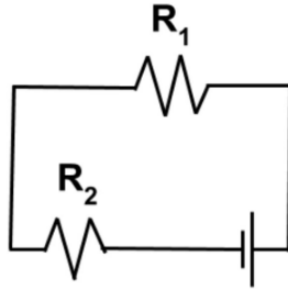
Question 6:



For the circuit shown, the resistances are $R_1 > R_2 > R_3 > R_4$. What is true about the current through each resistor?

- A. $I_1 > I_2 > I_3 > I_4$
- B. $I_1 > I_3 > I_2 > I_4$
- C. $I_1 = I_4 > I_2 = I_3$
- D. $I_1 = I_4 > I_3 = I_2$

Question 7:



Above is a diagram of a circuit. What should a student do to make this a short circuit?

- A. Remove resistor R_2 only and close the loop.
- B. Remove the battery and close the loop.
- C. Remove resistors R_1 and R_2 and close the loop.
- D. Remove resistor R_1 only and close the loop.

Question 8:

A student builds a simple circuit with a single resistor of resistance R and measures an electric potential difference of ΔV_1 across the resistor. Then, the student replaces the resistor with a new one of resistance $\frac{R}{2}$ and keeps the current the same. How does the electric potential difference ΔV_2 across the new resistor compare with ΔV_1 ?

- A. $\Delta V_2 = 4\Delta V_1$
- B. $\Delta V_2 = \frac{\Delta V_1}{2}$
- C. $\Delta V_2 = \frac{\Delta V_1}{4}$
- D. $\Delta V_2 = 2\Delta V_1$

Question 9:

A student builds a simple circuit with a single resistor of resistance R and measures an electric potential difference of ΔV across the resistor. Then, the student replaces the resistor with a new one of resistance $2R$ and keeps the electric potential the same. What is the current I_2 through the new circuit in terms of the original current, I_1 ?

- A. $I_2 = 2I_1$
- B. $I_2 = \frac{I_1}{2}$

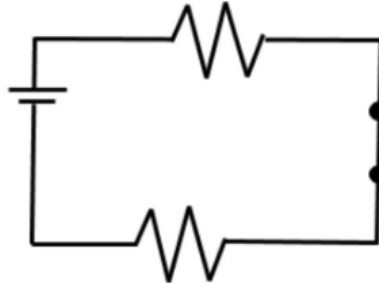
- C. $I_2 = 4I_1$
- D. $I_2 = \frac{I_1}{4}$

Question 10:

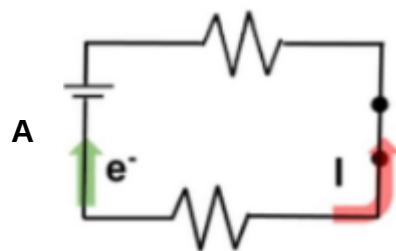
A student builds a simple circuit with a single resistor of resistance R and current I , and measures an electric potential difference of ΔV_1 across the resistor. Then, the student decreases the current through the circuit to $\frac{I}{2}$. How does the electric potential difference across the resistor ΔV_2 of the new circuit compare with ΔV_1 ?

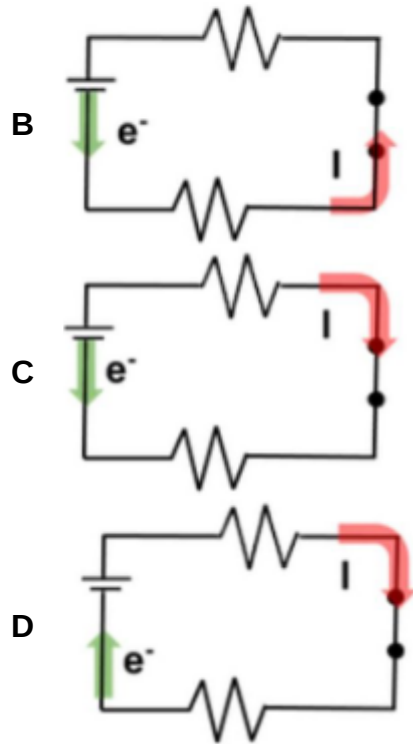
- A. $\Delta V_2 = \frac{\Delta V_1}{2}$
- B. $\Delta V_2 = \frac{\Delta V_1}{4}$
- C. $\Delta V_2 = 4\Delta V_1$
- D. $\Delta V_2 = 2\Delta V_1$

Question 11:

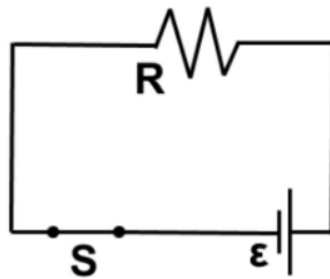


Above is a diagram of a circuit with a switch, two resistors, and a battery. Which of the following shows the correct pathways for the conventional current I and electron current e^- ?





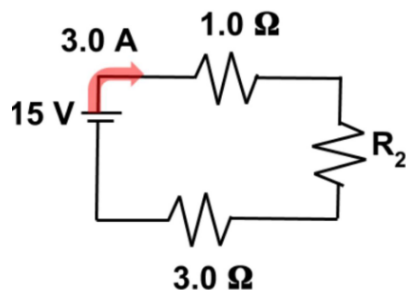
Question 12:



Above is a diagram of a circuit. Which type of circuit is this?

- A. Closed circuit
- B. Open Circuit
- C. Short Circuit

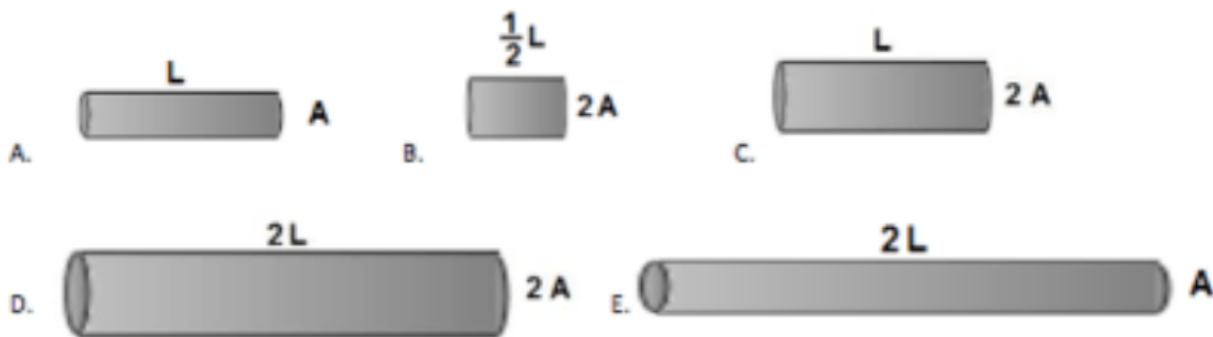
Question 13:



A 15 V battery causes 3.0 A of current to flow into the circuit above. What is the magnitude of the electric potential difference across resistor R_2 ?

- A. 15 V
- B. 12 V
- C. 27 V
- D. 3.0 V

Question 14:



Five wires are made of the same material. Which wire would give the least resistance?

- A. A
- B. C
- C. B
- D. E
- E. D

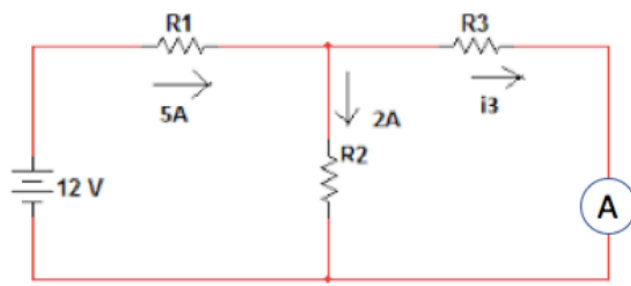
Question 15:

Compared to a 3-Ohm resistor, a 6-Ohm resistor has

- A. $\frac{1}{4}$ the power
- B. $\frac{1}{2}$ the power

- C. 2 times the power
- D. 4 times the power

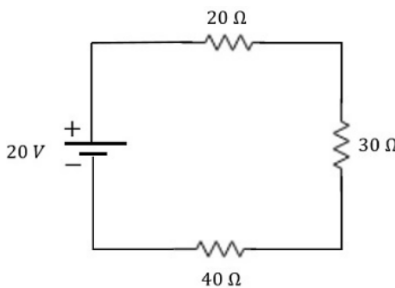
Question 16:



What is the reading on the ammeter in this circuit?

- A. need to know the resistance to determine
- B. 7 A
- C. 5 A
- D. 3 A

Question 17:



Which resistor will have the greatest electrical potential difference?

- A. 20 - Ohm
- B. 40 - Ohm
- C. 30 - Ohm
- D. all the same

Question 18:

Which of the following resistance cannot be produced with three 9-Ohm resistors?

- A. 3 – Ohms
- B. 6 – Ohms
- C. 13.5 – Ohms
- D. 27 – Ohms
- E. all of these are possible resistances

Question 19:

A complete electrical path is called a

- A. path
- B. current
- C. circuit
- D. light

Answer Key:

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