Practice - Simple Circuits - Part II

Name: _____ **Date:** _____

1. Three identical lamps are connected in parallel with each other. If the resistance of each lamp is X ohms, what is the equivalent resistance of this parallel combination?

   A. $X\Omega$ B. $\frac{X}{3}\Omega$ C. $3X\Omega$ D. $\frac{3}{X}\Omega$

2. A 3-ohm resistor and a 6-ohm resistor are connected in parallel across a 9-volt battery. Which statement best compares the potential difference across each resistor?

   A. The potential difference across the 6-ohm resistor is the same as the potential difference across the 3-ohm resistor.

   B. The potential difference across the 6-ohm resistor is twice as great as the potential difference across the 3-ohm resistor.

   C. The potential difference across the 6-ohm resistor is half as great as the potential difference across the 3-ohm resistor.

   D. The potential difference across the 6-ohm resistor is four times as great as the potential difference across the 3-ohm resistor.

3. Three resistors, 4 ohms, 6 ohms, and 8 ohms, are connected in parallel in an electric circuit. The equivalent resistance of the circuit is

   A. less than 4 Ω

   B. between 4 Ω and 8 Ω

   C. between 10. Ω and 18 Ω

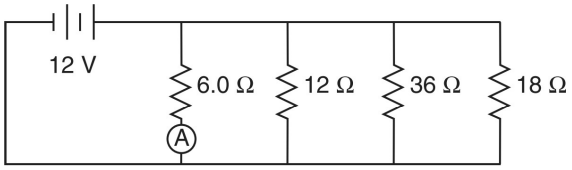
   D. 18 Ω

4. What is the total current in a circuit consisting of six operating 100-watt lamps connected in parallel to a 120-volt source?

   A. 5 A B. 20 A

   C. 600 A D. 12 000 A

5. Base your answer(s) to the following question(s) on the diagram below, which represents an electric circuit consisting of four resistors and a 12-volt battery.



   What is the equivalent resistance of this circuit?

   A. 72 Ω B. 18 Ω

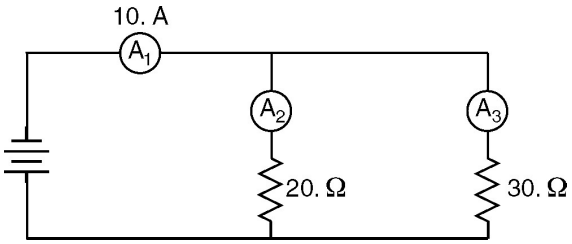
   C. 3.0 Ω D. 0.33 Ω

6. What is the current measured by ammeter A?

   A. 0.50 A B. 2.0 A

   C. 72 A D. 4.0 A

7. In the circuit diagram shown below, ammeter A_1 reads 10 amperes.



   What is the reading of ammeter A_2?

   A. 6.0 A B. 10. A C. 20. A D. 4.0 A

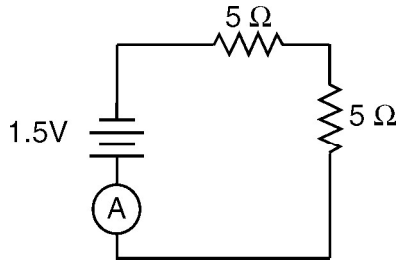
8. As more resistors are added in parallel, the total resistance of a circuit

   A. decreases B. increases

   C. remains the same

9. In which circuit would ammeter *A* show the greatest current?

A.



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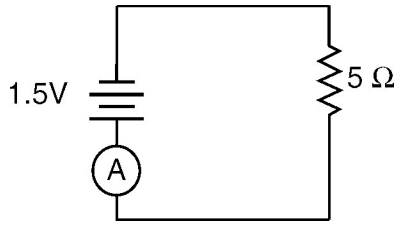
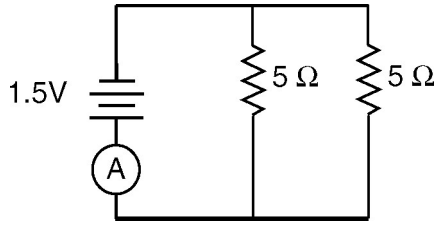
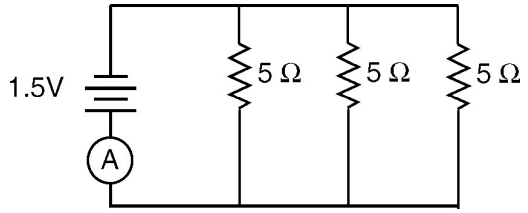


C.

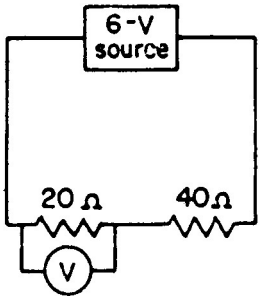


D.

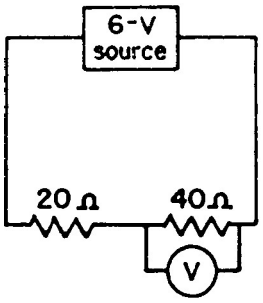


10. Which circuit would have the *lowest* voltmeter reading?

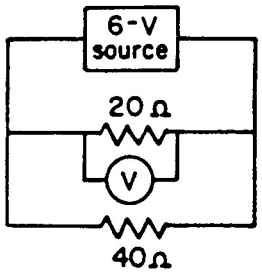
A.



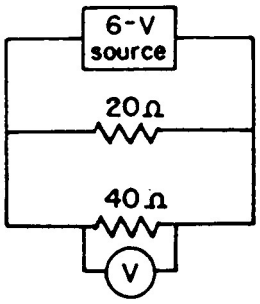
B.

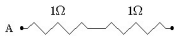


C.

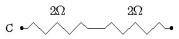


D.



11. A 

B 

C 

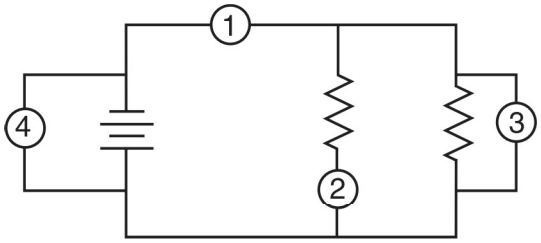
D 

Which two of the resistor arrangements shown have the same equivalent resistance?

A. A and B B. B and C

C. C and D D. D and A

12. In the electric circuit diagram below, possible locations of an ammeter and a voltmeter are indicated by circles 1, 2, 3, and 4.



Where should an ammeter be located to correctly measure the total current and where should a voltmeter be located to correctly measure the total voltage?

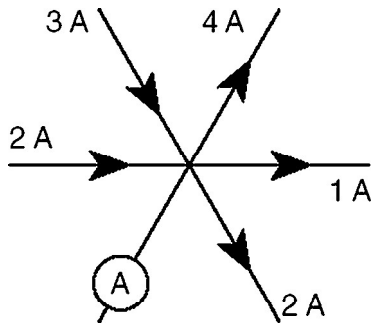
A. ammeter at 1 and voltmeter at 4

B. ammeter at 2 and voltmeter at 3

C. ammeter at 3 and voltmeter at 4

D. ammeter at 1 and voltmeter at 2

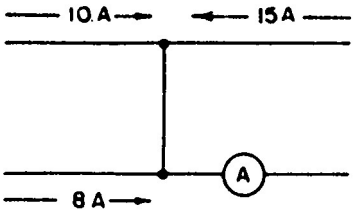
13. The accompanying diagram represents currents in a segment of an electric circuit.



What is the reading of ammeter A?

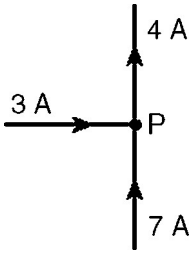
A. 1 A B. 2 A C. 3 A D. 4 A

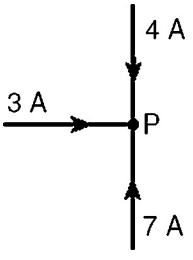
14. The diagram shown represents current flowing in branches of an electric circuit. What is the reading on ammeter *A* ?

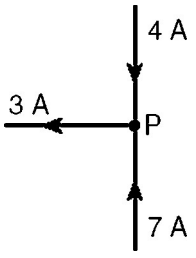


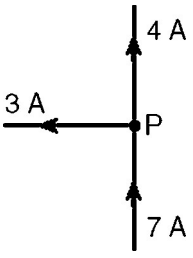
A. 13 A B. 17 A C. 3 A D. 33 A

15. Which diagram below correctly shows currents traveling near junction P in an electric circuit?

A. 

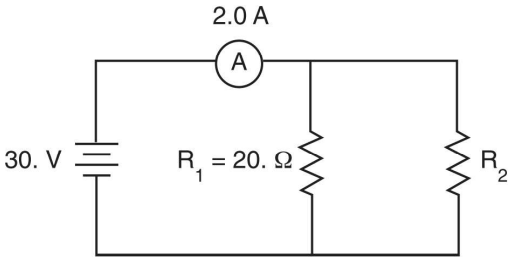
B. 

C. 

D. 

16. Base your answer(s) to the following question(s) on the information below.

A 20.-ohm resistor, R_1; and a resistor of unknown resistance, R_2, are connected in parallel to a 30.-volt source, as shown in the circuit diagram below. An ammeter in the circuit reads 2.0 amperes.



a. Determine the equivalent resistance of the circuit.

b. Calculate the resistance of resistor R_2.

17. Base your answer(s) to the following question(s) on the information below.

A 15-ohm resistor and a 20.-ohm resistor are connected in parallel with a 9.0-volt battery. A single ammeter is connected to measure the total current of the circuit.

a. Draw a diagram of this circuit using appropriate symbols from your reference table.[Assume the availability of any number of wires of negligible resistance.]

b. Determine the equivalent resistance of the circuit. [Show all work including the equation and substitution with units.]

c. Determine the current flowing through the 15 ohm resistor.