Simple Circuits - Part I

Name: _____ **Date:** _____

1. A circuit consists of a resistor and a battery. Increasing the voltage of the battery while keeping the temperature of the circuit constant would result in an increase in

   A. current, only

   B. resistance, only

   C. both current and resistance

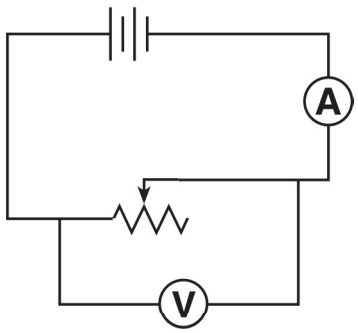
   D. neither current nor resistance

2. An electric circuit contains a variable resistor connected to a source of constant voltage. As the resistance of the variable resistor is increased, the power dissipated in the circuit

   A. decreases B. increases

   C. remains the same

3. The diagram below represents a simple circuit consisting of a variable resistor, a battery, an ammeter, and a voltmeter.



   What is the effect of increasing the resistance of the variable resistor from 1000 Ωto 10000 Ω? [Assume constant temperature.]

   A. The ammeter reading decreases.

   B. The ammeter reading increases.

   C. The voltmeter reading decreases.

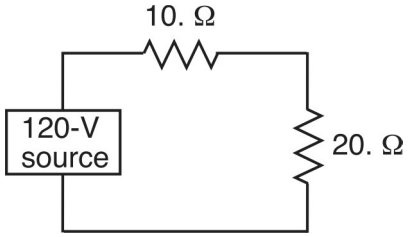
   D. The voltmeter reading increases.

4. Circuit *A* has four 3.0-ohm resistors connected in series with a 24-volt battery, and circuit *B* has two 3.0-ohm resistors connected in series with a 24-volt battery. Compared to the total potential drop across circuit *A*, the total potential drop across circuit *B* is

   A. one-half as great B. twice as great

   C. the same D. four times as great

5. The diagram below represents a circuit consisting of two resistors connected to a source of potential difference.



   What is the current through the 20.-ohm resistor?

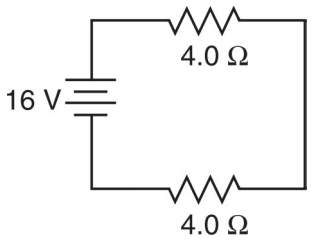
   A. 0.25 A B. 6.0 A

   C. 12 A D. 4.0 A

6. Three resistors of 20 ohms, 30 ohms, and 60 ohms, respectively, are connected in series with a battery. A current of 2.0 amperes will flow through this circuit when the potential difference of the battery is

   A. 10 V B. 20 V C. 110 V D. 220 V

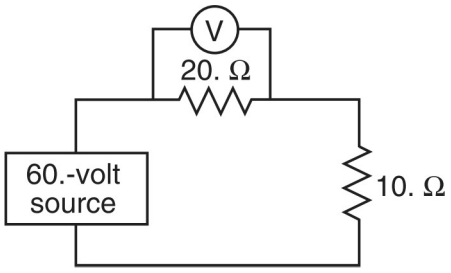
7. In the circuit diagram below, two 4.0-ohm resistors are connected to a 16-volt battery as shown.



The rate at which electrical energy is expended in this circuit is

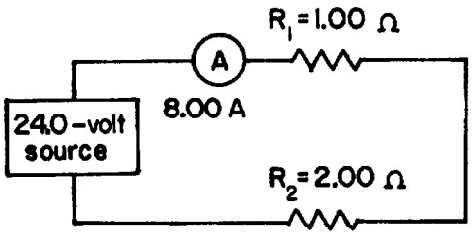
A. 8.0 W B. 16 W C. 32 W D. 64 W

8. In the circuit represented by the diagram below, what is the reading of voltmeter *V*?



A. 20. V B. 2.0 V C. 30. V D. 40. V

9. Base your answer(s) to the following question(s) on the diagram given.



What is the current in resistor R_2?

A. 8.00 A B. 2.00 A

C. 16.0 A D. 4.00 A

10. What power is supplied by the source?

A. 24.0 W B. 90.0 W

C. 3.00 W D. 192 W

11. What is the total resistance of the circuit?

A. 0.500 Ω B. 2.00 Ω

C. 3.00 Ω D. 4.00 Ω

12. The voltage drop across R_1 is

A. 0 V B. 8.00 V

C. 12.0 V D. 24.0 V

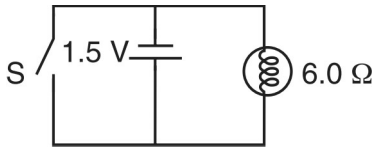
13. As more resistors are added to a series circuit, the total resistance of a circuit

A. decreases B. increases

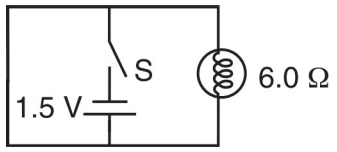
C. remains the same

14. A 6.0-ohm lamp requires 0.25 ampere of current to operate. In which circuit below would the lamp operate correctly when switch *S* is closed?

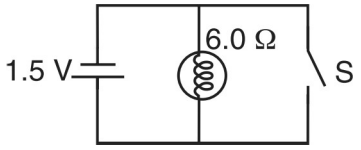
A.



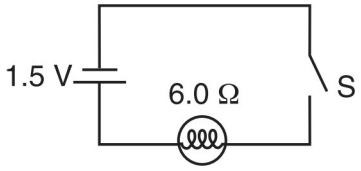
B.



C.

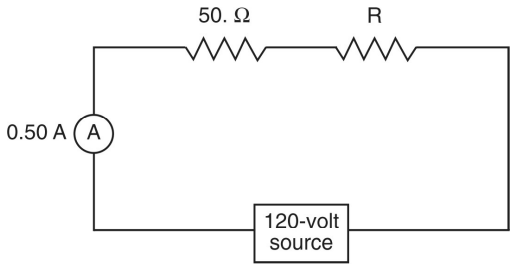


D.



15. Base your answer(s) to the following question(s) on the information and diagram below.

A 50.-ohm resistor, an unknown resistor *R*, a 120-volt source, and an ammeter are connected in a complete circuit. The ammeter reads 0.50 ampere.



a. Calculate the equivalent resistance of the circuit. [Show all work, including the equation and substitution with units.]

b. Determine the value of resistance of the unknown resistor R.