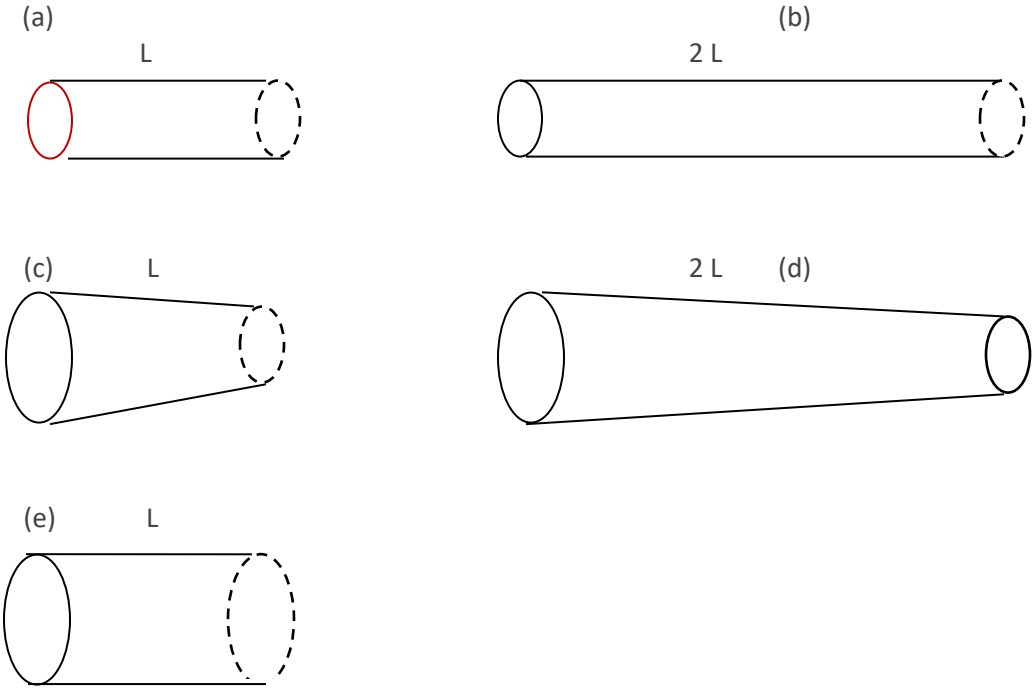
UCONN Physics 1202Q: **Copy # _____**
Unit 13: Electric Circuits Pre-Test

Directions: Use provided formula and conversion sheets provided. DO NOT write on this Test. Place each answer carefully upon the computer Scan-tron sheet or another answer sheet. Each question is worth 2 pts. Note that values may be rounded or approximations therefore choose only the best answer.

1. An electric iron rated at 1,000 W is operated for 45 min. If the cost per KWH is $0.07, what did it cost to run the electric iron?
   a. 3150 cents b. $3.15 c. 10.71 cents d. 5.25 cents e. $21.00

2. A 1 Ω resistor, a 1000 Ω, and a 2000 Ω resistor are connected in parallel. The total resistance is __?
   a. < 1 Ω b. > 1000 Ω c. > 2000 Ω d. > 3000 Ω

3. The five wires shown below have their lengths and cross-sectional areas as indicated and are made of material with the same resistivity. Which resistor has the least resistance?



4. When an RC circuit is connected together, what happens to the charge on the capacitor over time? And What happens to the current in the circuit over time?
   a. Charge on the capacitor increases, current in the circuit increases
   b. Charge on the capacitor increases, current in the circuit decreases to 1 amp
   c. Charge on the capacitor decreases, current in the circuit increases
   d. Charge on the capacitor decreases, current in the circuit decreases
   e. Charge on the capacitor increases, current in the circuit decreases to zero

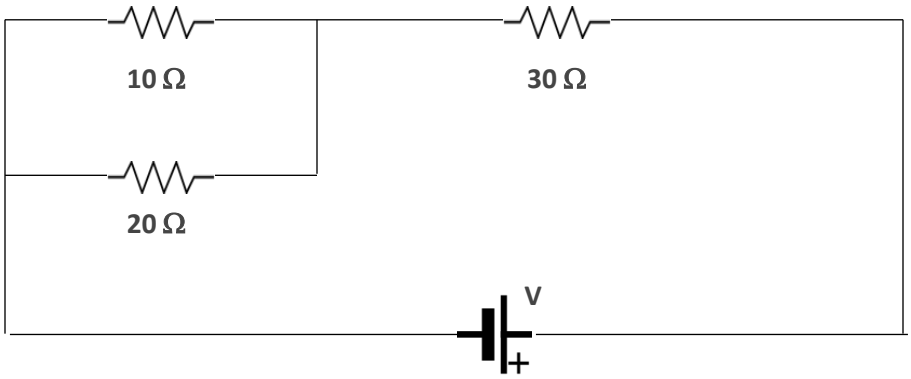
5. Increasing the current in a resistor by a factor of 2 causes the heat (energy) produced by the resistor to change by a factor of:
   a. 4 b. 2 c. 1/2 d. 1/4

6. Kirchhoff's loop rule is an example of
   a. conservation of energy.
   b. conservation of charge.
   c. conservation of momentum.
   d. none of the given answers

7. What is the unit for Resistance is:?
   a. ohms / C
   b. C / ohms
   c. J / C
   d. $J \cdot s / C^2$

8. Which of the following is true about the resistance of a connecting wire in a circuit?
   a. the larger the cross-sectional area of a wire, the less the resistance
   b. the shorter the wire, the greater the resistance
   c. the longer the wire, the less the resistance
   d. the smaller the cross-sectional area of a wire, the less the resistance

Use the diagram below to answer questions 9, 10, and 11.

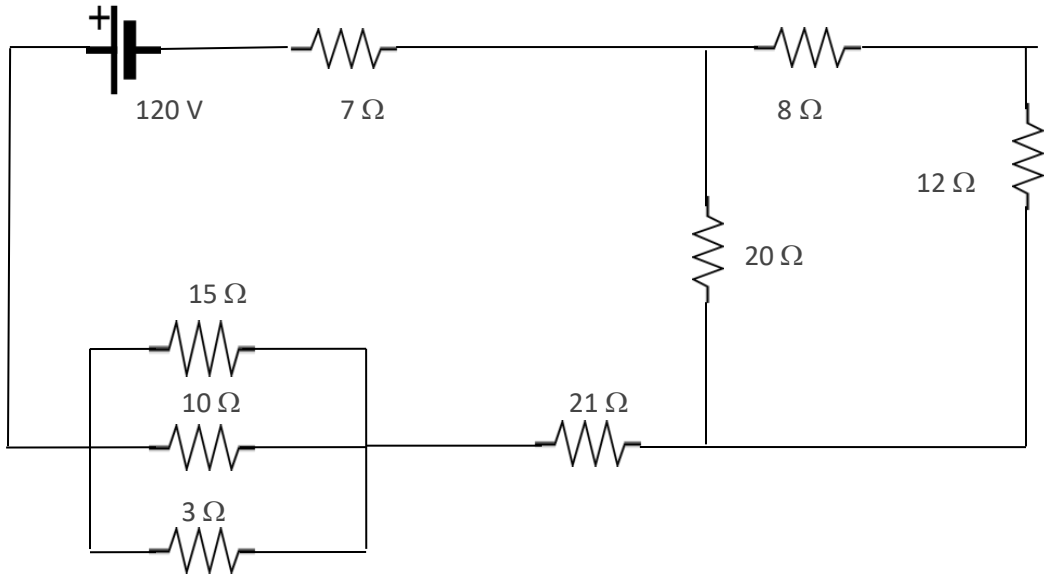


9. If the current in the 10 Ω resistor is 1.0 Amp, the current in the 20 Ω resistor is:
   a. 0.50 A b. 1.00 A c. 2.00 A d. 4.00 A e. Impossible to determine, no volts

10. The resistor that produced the most heat (energy) is:
    a. 10 Ω b. 20 Ω c. combination of the 10 Ω and 20 Ω d. 30 Ω

11. "V" is equal to the sum of the voltages across:
    a. the 20 Ω and the 30 Ω resistors
    b. the 10 Ω and the 20 Ω resistors
    c. the 10 Ω , 20 Ω , and 30 Ω resistors
    d. the question cannot be answered without more information

Use the diagram below to answer question 12 – 18.



12. Calculate the total resistance in the previous circuit:
    a. 40 Ω b. 70 Ω c. 28.6 Ω d. 96 Ω

13. Calculate the Voltage Drop for the 7 Ω resistor:
    a. 120 V b. 21 V c. 7 V d. 30 V

14. Calculate the Voltage Drop for the 10 Ω resistor:
    a. 120 V b. 10 V c. 6 V d. 63 V

15. Calculate the Voltage Drop for the 12 Ω resistor:
    a. 120 V b. 30 V c. 12 V d. 18 V

16. Calculate the Amperes in the 20 Ω resistor:
    a. 3 A b. 1.5 A c. 2 A d. 0.6 A

17. Calculate the Amperes in the 21 Ω resistor:
    a. 3 A b. 1.5 A c. 2 A d. 0.6 A

18. Calculate the Amperes in the 3 Ω resistor:
    a. 3 A b. 1.5 A c. 2 A d. 0.6 A

19. An ammeter has an internal resistant that is:
    a. high b. low

20. If you have three identical resistors in parallel and one is removed, the current through the remaining resistors:
    a. increases b. decreases c. remains the same

21. The resistance of a wire at constant temperature depends on the wires:
    a. length, only c. length and cross-sectional area, only
    b. type of metal, only d. length, cross-sectional area and type of metal

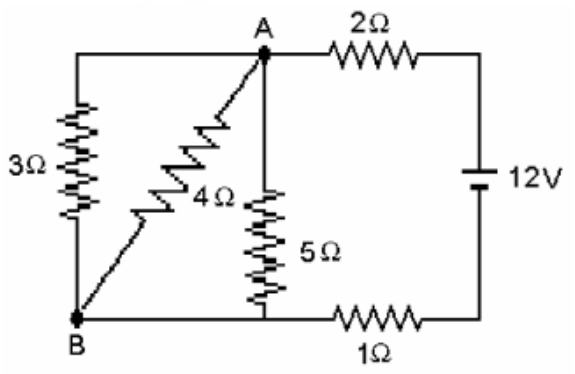
22. A clothes iron has a current of 10 A when 120 V is applied for 60 seconds. The total energy dissipated during the 60 seconds is:
a. 10 J b. 20 J c. 1200 J d. 72000 J

23. Three resistors of 10 Ω , 20 Ω and 30 Ω are connected in series to a 120 V source. The power developed is:
a. greatest in the 10 Ω resistor
b. greatest in the 20 Ω resistor
c. greatest in the 30 Ω resistor
d. the same in all three resistors

24. A 12 Volt battery is connected to a 4-ohm resistor and a 5-farad capacitor in series. When the circuit is first connected, what is the current flowing through the circuit?
a. 3 amps b. 6 amps c. 0 amps d. 12 amps e. 4 amps

25. As the temperature of a metal conductor is reduced, the resistance of the conductor will:
a. decrease b. increase c. remain the same

26. For the adjacent circuit determine the current in the 1-Ω resistor.
a. 0.90 A
b. 1.2 A
c. 2.8 A
d. 3.2 A



27. How long must a 100 Watt light bulb be used in order to dissipate 1000 J of electrical energy?
a. 10 sec b. 100 sec c. 1000 sec d. 100,000 sec

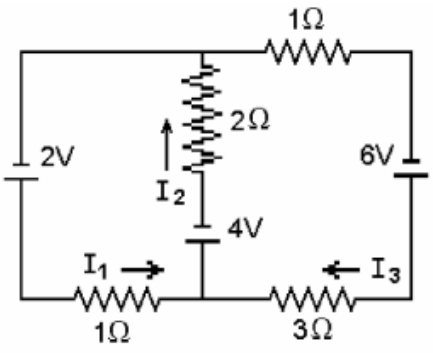
28. What is the current in a circuit if 12 Coulombs of charge pass a given point in 3.0 seconds?
a. 12 A b. 36 A c. 3.0 A d. 4.0 A

29. If the current and the resistance of an electric circuit are each doubled, the power will be:
a. remain the same
b. double
c. increased by 8
d. quadruple

30. Which of the following is a unit of electrical energy?
a. ampere b. kilowatt-hour c. volt d. watt

31. Two capacitors of 6.00 µF and 8.00 µF are connected in parallel. The combination is then connected in series with a 12.0-V battery and a 14.0-µF capacitor. What is the voltage across the 6.00-µF capacitor?
a. 4.00 V b. 5.00 V c. 6.00 V d. 12.0 V

32. Which of the equations here is valid for the circuit shown?



a. $2 - I_1 - 2I_2 = 0$
b. $2 - 2I_1 - 2I_2 - 4I_3 = 0$
c. $4 - I_1 + 4I_3 = 0$
d. $-2 - I_1 - 2I_2 = 0$
e. $6 - I_1 - 2I_2 = 0$

33. Energy is being consumed at the greatest rate in an appliance drawing:
a. 5 amps at 110 volts.
b. 5 amps at 220 volts.
c. 10 amps at 110 volts
d. 10 amps at 220 volts

34. As more and more capacitors are connected in parallel, the equivalent capacitance of the combination increases.
a. always true
b. Sometimes true; it depends on the voltage of the battery to which the combination is connected.
c. Sometimes true; it goes up only if the next capacitor is larger than the average of the existing combination.
d. never true

35. Electric power companies transmit electricity to your homes via high voltage lines because:
a. this is necessary to supply equal power to all homes
b. this is necessary to prevent buildup of ice on the lines
c. this is necessary to keep animals off the lines
d. this is necessary to reduce the loss of energy in route to your home

CHAPTER / UNIT # _13__ ANSWER SHEET NAME: __PRE TEST_____
COPY # _____ PERIOD:_____
FORM _____ / DATE: _____

DIRECTIONS: **Use the back side for any Bonus problems and be sure to identify the bonus area. The "Work Area" is to be used like scrap paper. If you need additional paper, raise your hand and I will provide you additional paper. Any extra scrap paper needs to be stapled to this answer sheet. GOOD LUCK!!**

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__E__ 3.
__E__ 4.
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WORK AREA