Due 3/30 no 3

Electricity 7

Equation	
In Series	$R_T = R_1 + R_2 \ldots$
In Parallel	$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots$

Example: 3 resistors are in parallel: 4Ω, 5Ω, and 7Ω. Find the total resistance of three resistors.

Solution: Since in parallel use:

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots \qquad \frac{1}{R_T} = \frac{1}{4} + \frac{1}{5} + \frac{1}{7}$$

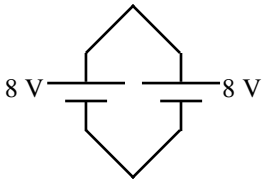
$$\frac{1}{R_T} = .25 + .2 + .143 \qquad \frac{1}{R_T} = .593$$

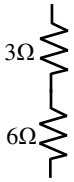
$$R_T = \frac{1}{.593} = 1.7\Omega$$

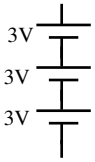
1. Series or Parallel?

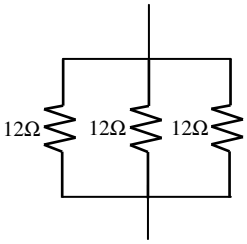
A) ___ If one bulb is unscrewed, they both go off.
B) ___ Both devices have the same current.
C) ___ If one light bulb is unscrewed, the other stays on.
D) ___ Both devices have the same voltage across them.
E) ___ Has more than one path.
F) ___ Has only one path for the electricity.
G) ___ Has a place where the current splits and joins again.

2. Using your equations and rules for series and parallel circuits to find the total voltage or resistance of the following.





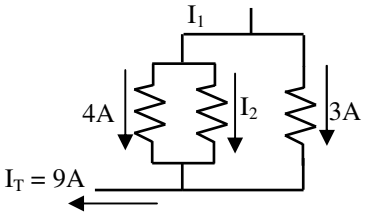




3. Find the two unknown currents in the circuit at the right.

I_1 =

I_2 =

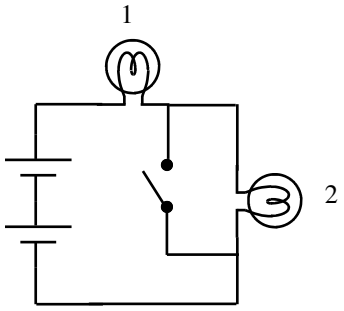


4. Using the choices at the right to tell someone how to make a series circuit: (you can use them more than once).

Battery; light bulb; wire; split; join; two bulbs next to each other.

5. Use the same words to tell someone how to make a parallel circuit.

6. What do we call a place where electricity splits in a circuit?



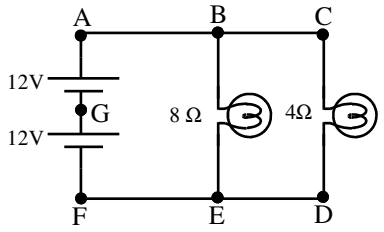
7. Use the circuit at the left to answer the following.
A) What happens when the switch is closed?

B) How does the brightness of bulb 1 compare before and after the switch is closed?

8. What happens if you put a wire across the terminals of a battery (between the positive and negative ends of a battery?

9. How can this be dangerous?

10. Use the diagram to answer:
    A) Total voltage:
    B) Parallel or series?
    C) Which light bulb will have more current flowing thru it?
    D) What is the V from F to D (V_{FD})?
    E) V_{BC} = V_{AE} = V_{DG} = V_{BE} =
    F) Find the current going thru the 8 Ω resistor.



    G) Find the current going thru the 4 Ω resistor.

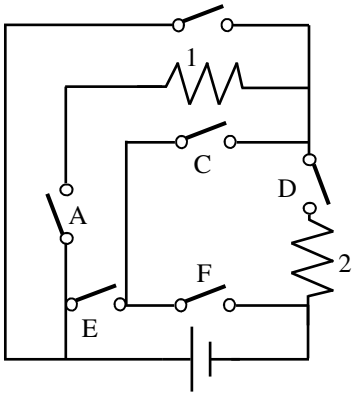
    H) What is the I_T?

    I) Find R_T:

11. If a circuit has 3 A of current, how much charge moves in 10 seconds?

12. Using your answer from #11, how many electrons moved in the above 10 seconds?

13. What kind if energy does a battery give?
14. If a Volt is a J/C, how much energy does a 12 V battery give a 3 coulomb charge?
15. Which side of a battery does electricity come from?
16. Where does it go to?
17. Using the above rules, answer questions about the following diagram.
    A) Which switches have to be on to make electricity flow only thru resistor 1?



    B) Which switches for only resistor 2 to have current thru it?

    C) Which switches to by-pass both resistors?

    D) Which switches for electricity to go thru both resistors?