Homework 7

Name _____ Date _____ Period _____

SERIES/PARALLEL CIRCUITS – Work Sheet Two

Resolve the following problems **and** draw the schematic diagram for each problem.

Show your work.

1. Calculate the total resistance for a 650 ohm, a 350 ohm, and a 1000 ohm resistor connected in series.

2. Calculate the total resistance for ten 120 ohm resistors in series.

3. A string of fifty 15 ohm Christmas tree lights are connected in series. One burns out, they all burn out. Calculate the total resistance.

4. Calculate the total resistance for two 180 ohm resistors connected in parallel.
5. A 10 ohm, 20 ohm, and 100 ohm resistors are connected in parallel. Calculate the total resistance.

6. A string of fifty 15 ohm Christmas tree light are connected in parallel. One burns out, the rest will stay lit. Calculate the total resistance.

7. Two 100 ohm resistors are connected in series and they are connected to a 1.5 VDC battery. What is the total current flowing in the circuit?

8. Those fifty 15 ohm, series connected Christmas tree lights, calculate the total current in the circuit if they are connected to a 115 VAC source.

9. Those fifty 15 ohm parallel connected Christmas tree lights. Calculate the total current in the circuit if they are connected to a 115 VAC source.

10. Three 1.2 ohm lamps are connected in series and connected to a 3 volt battery. Calculate the total current in the circuit.

11. Three identical lamps are connected in series to each other and then connected to a 6 V battery. What is the voltage drop across each lamp?

12. How does the current behave in a series circuit?

13. Two 33 ohm resistors are connected in parallel followed by two more 33 ohm resistors connected in parallel. What value of a single resistor would be used to replace these four resistors?

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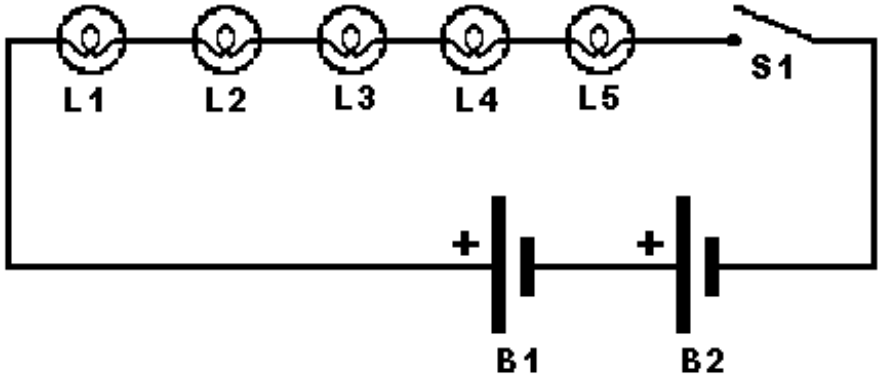
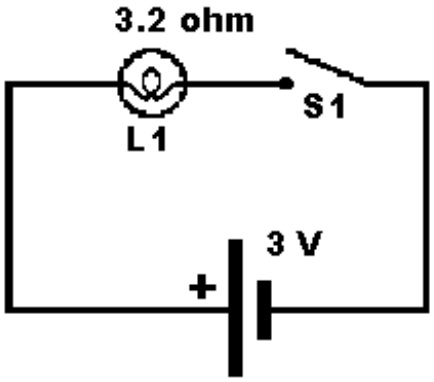
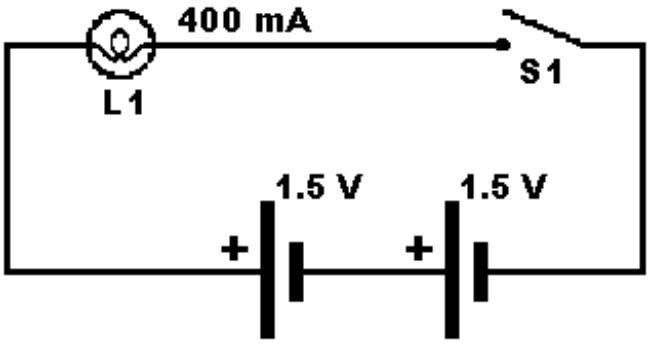
14. In the diagram below, the batteries are 1.5 VDC and each lamp has a resistance of 1.1 ohm. When the switch is closed, what is the current through each lamp and what is the power dissipated in each lamp?



15. In the diagram below, what is the current through the lamp when the switch is open; when the switch is closed?



16. In the diagram below, what is the internal resistance of the light after the switch is closed? What is the power dissipated by the lamp?



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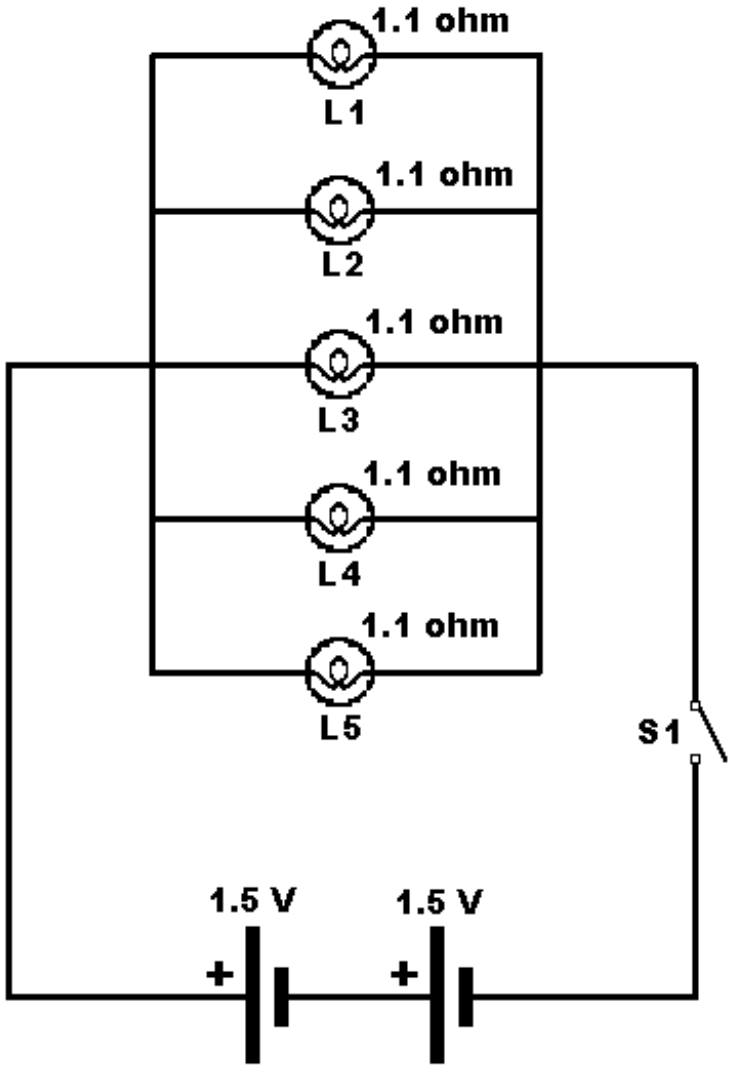
17. How does voltage behave across components in a parallel circuit?

18. What happens to the current in a parallel circuit?

19. In the circuit below, calculate the total resistance, the voltage across each resistor and the current flow through each resistor after the switch is closed.



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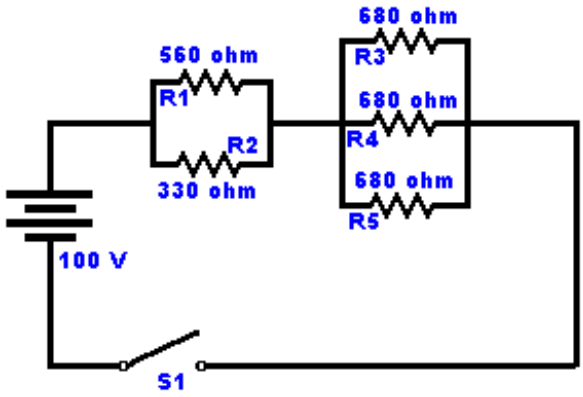

In the above diagram be able to solve for the current at any pint in the circuit.

An approach to solving:
1. Calculate the RT for R1 and R2.
2. Calculate the RT for R3, R4, and R5.
3. Find the RT for the entire circuit.
4. Find the total current in the circuit.
5. Calculate the voltage drop across R1/R2.
6. Calculate the voltage drop across R3/R4/R5.
7. Calculate the current through R1.
8. Calculate the current through R3, R4, and R5.
9. Show how Kirchoff's Law of current applies at Junction 1 (the three 680 ohm resistors and S1.
10. Show how Kirchoff's Law low of voltage applies to this circuit by writing the loop equations.