EN 111 - Module 5 - Electrical Circuit Basics - Simple Series and Parallel Circuits

Questions from the Explanation

1) What is the total resistance with 4 3.5 Ohm light bulbs?
2) What is the current in the same circuit with a 9V battery?
3) Add a single light bulb in series with the resisters. Assuming the light bulb has a resistance of about 3.5 Ohms, what is the total resistance?
4) What is the total current with a 9V battery?
5) Take a photo of your circuit and post it here. How did you go from the schematic model of the circuit to actual components (battery, resistors, bulbs, and alligator clips?)
6) With the additional a second 3.5 Ohm light bulb, what is the total resistance and total current?
7) Did you notice a change in the brightness of the bulb(s)?
8) If you remove one bulb, what happens and why?
9) With the 2 bulbs in parallel after the 4 light bulb “resistor”, what the resistance of the circuit?
10) How does this compare to the series circuit? Why is the resistance less?
11) Take a photo of your circuit and post it here. How did you go from the schematic model of the circuit to actual components (battery, resistors, bulbs, and alligator clips?)
12) Did you notice a change in the brightness of the bulb(s) compared to the series circuit?
13) If you remove one bulb from the parallel circuit, what happens and why?

Useful Equations

Ohm’s Law \( V = IR \) Voltage = Current times Resistance

Total Series Resistance \( R_T = R_1 + R_2 + \ldots + R_n \)

Total Parallel Resistance \( \frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots + \frac{1}{R_n} \)