

Answer on Question 67045, Physics, Electric Circuits

Question:

A 24 V supply is used to connect 2 lamps in series. What difference will there be, if any, in current and resistances of the lamp?

Answer:

There is a difference between series and parallel connection of two lamps. In the series circuit the current is the same for all of the lamps while in the parallel circuit the total current is the sum of the currents through each of the lamp:

$$I_s = I_1 = I_2,$$

$$I_p = I_1 + I_2$$

Also, the equivalent resistance of two lamps connected in parallel is always smaller than the equivalent resistance of two lamps connected in series:

$$R_p < R_s$$

$$R_s = R_1 + R_2,$$

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}.$$

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