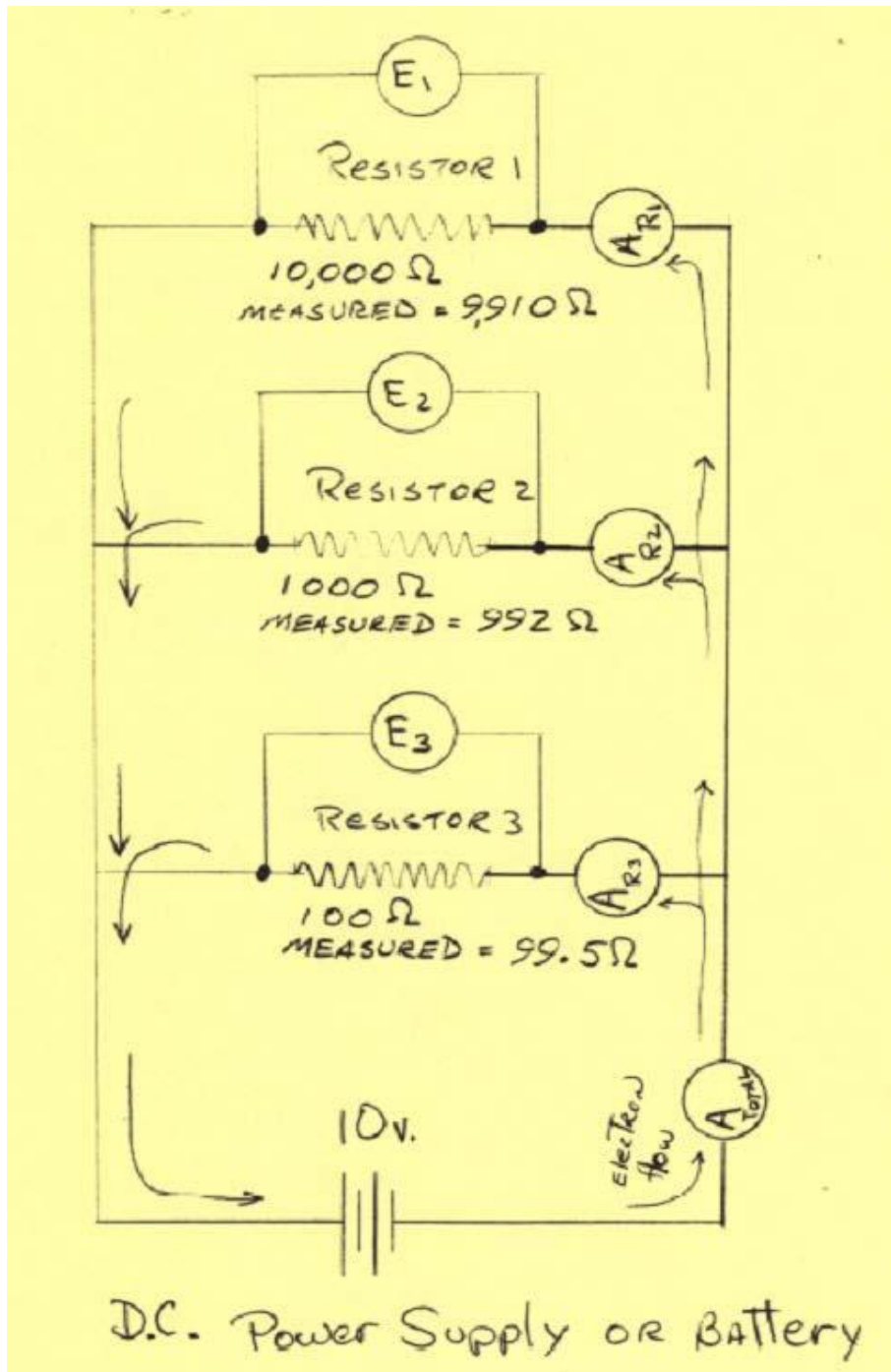




Basic Electricity – Unit 6: Other Basic Circuit Fundamentals

Lab 2

Instructions: Solve the following parallel circuit and verify the results in the lab.





Basic Electricity – Unit 6: Other Basic Circuit Fundamentals

Lab 2

	Given Value	Color Code	Measured Value
R1			
R2			
R2			

V1			
V2			
V3			

I1			
I2			
I3			

	Calculated Power of Component
PR1	
PR2	
PR3	

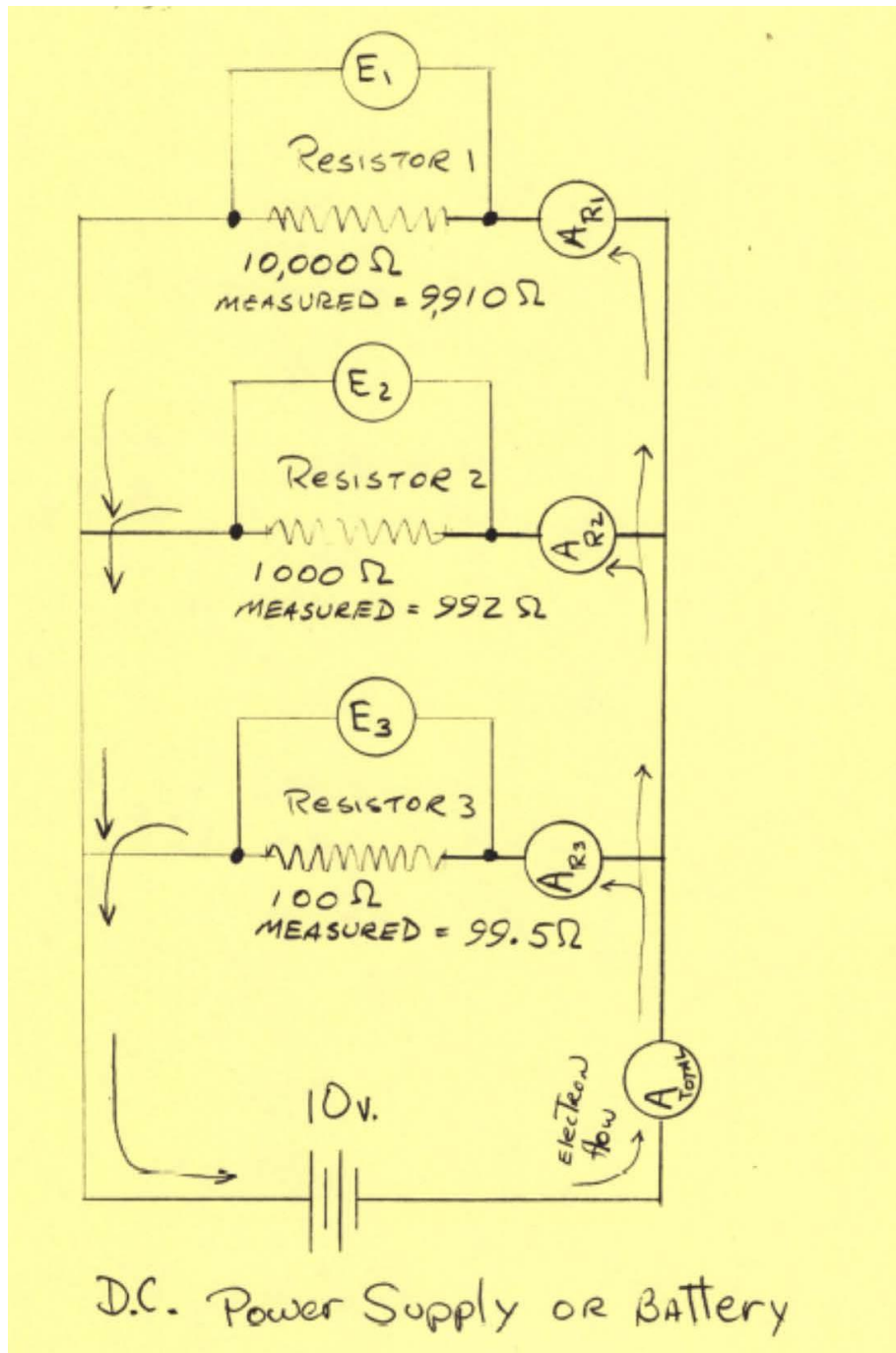




Basic Electricity – Unit 6: Other Basic Circuit Fundamentals

Lab 2

Solution:





Basic Electricity – Unit 6: Other Basic Circuit Fundamentals

Lab 2

TOTAL VOLTAGE = GIVEN = 10V.

TOTAL RESISTANCE

$$= \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}}$$
$$= \frac{1}{\frac{1}{10,000 \Omega} + \frac{1}{1000 \Omega} + \frac{1}{100 \Omega}}$$
$$= \frac{1}{.0111}$$
$$= 90.090909 \Omega \text{ OR APPROXIMATELY } 90 \Omega$$

RULE #1 PARALLEL CIRCUITS
THE TOTAL RESISTANCE IS ALWAYS
LESS THAN THE SMALLEST OF THE
INDIVIDUAL RESISTANCES.
therefore 90Ω LESS THAN 100Ω




Basic Electricity – Unit 6: Other Basic Circuit Fundamentals

Lab 2

USING THE MEASURED RESISTOR VALUES.

$$\frac{1}{9910\Omega} + \frac{1}{992\Omega} + \frac{1}{99.5\Omega}$$
$$= \frac{1}{.011159223}$$
$$= 89.61196629 \Omega$$

TO FIND TOTAL CURRENT
USE OHM'S LAW.

$$I_{TOTAL} = \frac{E_{TOTAL}}{R_{TOTAL}}$$
$$= \frac{10V}{90\Omega}$$
$$= .111 A$$




Basic Electricity – Unit 6: Other Basic Circuit Fundamentals

Lab 2

RULE #2 PARALLEL CIRCUITS

VOLTAGES OF PARALLEL BRANCHES
ARE EQUAL.

THEREFORE THE VOLTAGE ACROSS R_1 OR

$$E_1 = E_2 = E_3 = E_T \text{ IN THIS CASE.}$$

RULE #3 PARALLEL CIRCUITS

THE INDIVIDUAL BRANCH CURRENTS
ADD UP TO THE TOTAL CURRENT.

THEREFORE USING OHM'S LAW.



$$I_1 = \frac{E_1}{R_1}$$

$$I_2 = \frac{E_2}{R_2}$$

$$I_3 = \frac{E_3}{R_3}$$



Basic Electricity – Unit 6: Other Basic Circuit Fundamentals

Lab 2

$$I_1 = \frac{10V}{10,000\Omega} = .001 A$$

$$I_2 = \frac{10V}{1000\Omega} = .01 A$$

$$I_3 = \frac{10V}{100\Omega} = .1 A$$

WHEN I_1 , I_2 , I_3 ARE ADDED
Together

$$\begin{array}{r} .001 A \\ .01 A \\ .1 A \\ \hline .111 A \end{array}$$

they EQUAL THE TOTAL CURRENT
CALCULATED OR .111 A.



Basic Electricity – Unit 6: Other Basic Circuit Fundamentals

Lab 2

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