LAB NO: 03

IMPLEMENTATION OF A PARALLEL DC CIRCUIT

OBJECTIVE:

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THEORY:

PARALLEL DC CIRCUIT:

If two or more components are connected in parallel they have the same potential difference across their ends. The potential differences across the components are the same in magnitude, and they also have identical polarities. The same voltage is applicable to all circuit components connected in parallel. The total current is the sum of the currents through the individual components, in accordance with Kirchhoff's current law.

VOLTAGE:

In a parallel circuit the voltage is the same for all elements

$$V = V_1 = V_2 = \ldots = V_n$$

RESISTOR:

The total resistance of resistors in parallel circuit is given as:

$$\frac{1}{R_{\text{total}}} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots + \frac{1}{R_n}$$

CURRENT:

The current in each individual resistor is found by Ohm's law. Factoring out the voltage gives:

$$I_{\text{total}} = V\left(\frac{1}{R_1} + \frac{1}{R_2} + \cdots + \frac{1}{R_n}\right).$$

KIRCHHOFF'S CURRENT LAW (KCL):

Kirchhoff's Voltage Law (KVL) states that "at any node (junction) in an electrical circuit, the sum of currents flowing into that node is equal to the sum of currents flowing out of that node".

APPARATUS:

- DC Power Supply
- Resistors
- Digital Multimeter (DMM)

SCHEMATIC DIAGRAM:

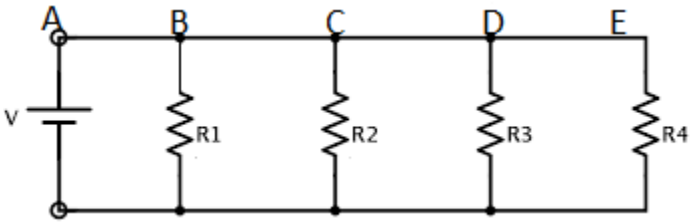

Figure 3.1: Parallel DC Circuit

PROCEDURE:

CALCULATIONS:

V(Theoretical)	V_A	V_B	V_C	V_D	V_E
V(Measured)					

Table 3.1

Current Through	I(Theoretical)	I(Measured)
R_1		
R_2		
R_3		
R_4		
I_{TOTAL}		

Table 3.2

CONCLUSION:

POST LAB QUESTIONS:

1. Is KCL verified in this experiment?

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2. What will be the value of equivalent resistance in the circuit?

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3. Why the value of voltage is same across each resistor in a parallel circuit?

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Teacher Remarks:

Obtained Marks: _____ / 10