Lab 3: Equivalent Resistance

Purpose:

Understand equivalent resistance for series, parallel, T, and π resistive networks.

Equipment and Components:

1. Resistors: 3.3 kΩ, 6.8 kΩ, 15 kΩ
2. DC power supply
3. Digital multimeter

Procedure:

1. HW 4 Problem: Calculate the equivalent resistance for the circuits in Fig. 1&2. Calculate the voltage drop across and the current flowing through each resistor.

\[ \text{Fig. 1: Series combination} \quad \text{Fig. 2: Parallel combination} \]

2. HW 4 Problem: Utilize equivalent resistances to solve the circuit in Fig. 3. Determine the voltage drop across and the current flowing through each resistor.

\[ \text{Fig. 3: Circuit with both series and parallel combinations} \]

3. HW 4 Problem: Calculate the resistance between the terminals \( R_{ab}, R_{ac}, \) and \( R_{bc} \) for the T circuit shown in Fig. 4.
4. **HW 4 Problem:** Calculate the resistance between the terminals $R_{ab}$, $R_{ac}$, and $R_{bc}$ for the $\pi$ circuit shown in Figure Fig. 5.

5. Build the circuit in Fig. 1. Measure the voltage drop across and current through each of the resistors.

6. Build the circuit in Fig. 2. Measure the voltage drop across and current through each of the resistors.

7. Build the circuit in Fig. 3. Measure the voltage drop across and current through each of the resistors.

8. Build the T circuit in Fig. 4. Measure the resistance between the terminals $R_{ab}$, $R_{ac}$, and $R_{bc}$.

9. Build the $\pi$ circuit in Figure 5. Measure the resistance between the terminals $R_{ab}$, $R_{ac}$, and $R_{bc}$.

**Conclusions:**

Discuss the lessons learned from this lab. Did you find any differences between the calculated values and the measurements you made in lab? Explain any significant discrepancies.

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**Always power down your circuit before working on your circuit or making adjustments to your existing circuit.**