LAB 5 Report (The loop and junction rules)

Abstract

This experiment explains the conservation of charge in a circuit and how it explains a junction in a circuit where a current entering a junction is the same amount that gets to leave it. In addition to the loop rule where it says the sum of any voltage differences in a circuit is always zero. The junction rule will be used in part A of the experiment in a parallel circuit with two resistors, where the total current minus first and second current is equal to zero. For part B the loop rule is used with a parallel circuit where the top side has one resistor and the other side has two resistors. Where the voltage measured on one side of the resistors minus the battery's voltage is zero.

Procedure

The materials used in the experiment is a power supply, three different resistors 1 kΩ to 10 MΩ wires and a multimeter/voltimeter. For part A of the experiment, construct a parallel circuit with one resistor on each side. Next insert the multimeter into the circuit and measure it when it is entering, leaving, and total at the junction and measure the uncertainty of the current. Next for part B create a new parallel circuit with a resistor on one side and two resistors on the other and measure the voltage for every resistor of each loop.

Raw Data

Part A

Part A	R(KΩ)	I(mA)	Estimate Uncertainty	I(mA)+-
R1	32.76	259.5	1	260.5
R2	38.81	306.4	1	307.4
Power Supply	X	10	0.001	10.001
total I(mA)		558.89	1	559.89

Experimental result(mA)		error due to measurement	original value	value with error		Theory-Exp
-7.01	Itot	-1	-7.01	-6.01		-8.74205081
	I1	1	-7.01	-8.01		Theory-Exp/Total Error

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	I2	1	-7.01	-8.01		-0.19812866
	total error	1.732050808		P(X > 0.198)	42.1%	

Part B

Part B	R(KΩ)	V(V)	Estimate Uncertainty	V(V)+-
R1	32.76	7.681	0.001	7.682
R2	38.81	10.011	0.001	10.012
R3	9.9	2.321	0.001	2.322
Power Supply	X	10.03	0.001	10.031

Experimental result(V)		error due to measurement	original value	value with error		Theory-Exp
0.009	V1	-0.001	0.009	0.01		-5.672
	V2	-5.681	0.009	5.69		Theory-Exp/Total Error
	V3	0.001	0.009	0.008		-1.00159
	total error	5.681000176		P(X > 1)	15.8%	

Calculation and Reasoning