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Laboratory 1:
Resistance, Current and Voltage

Part 1: Ohm's Law

	Resistor Colour-Code	Colour-Coded Resistance	Colour-Coded Tolerance	Max Coded Resistance	Min Coded Resistance	Measured Resistance	Is the resistor within Tolerance
R_1	A	4600 Ω	1%	4600 Ω	4570 Ω	4615 Ω	Yes
R_2	B	10000 Ω	1%	9900 Ω	9980 Ω	9940 Ω	Yes
R_3	C	2200 Ω	1%	2190 Ω	2170 Ω	2180 Ω	Yes

Part 2: Resistors in Series

Part 2.1

R_1	4600 Ω
R_2	10000 Ω
R_3	2200 Ω
Calculated R_{total} *	16800 Ω
Measured R_{total}	16740 Ω

** Show your calculation here:*

$R_{total} = R_1 + R_2 + R_3$

Part 2.2

$I_{R1\text{-}TOP}$	9.1 μ m
$I_{R2\text{-}TOP}$	9.1 μ m
$I_{R3\text{-}TOP}$	9.1 μ m
$I_{R3\text{-}BOTT}$	9.1 μ m

What conclusions can be made from these results?

The current flowing through the series resistors is equal

ANSWER: The current of the series circuit is equal

Part 2.3

V_1	0.658V
V_2	3.020V
V_3	1.352V
Total of voltage drops	5.03V

What conclusions can be made from these results?

The sum of the voltages of the series resistors is equal to the total voltage (without considering the internal resistance of the supply)
The larger resistance it is, the lagger the voltage is.

ANSWER:

1. The specific voltage of the resistance in a series circuit is equal to the specific voltage of the resistance.

2. Total of voltage drops is equal to the sum of the voltage drops

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Part 3: Resistors in Parallel

Part 3.1

Calculated R_{total}*	1295 Ω
Measured R_{total}	1248 Ω

** Show your calculation here:*

1/ $R_1 + 1/R_2 + 1/R_3 = 1/R_{total}$

Part 3.2

I_{R1}	0.508mA
I_{R2}	1.10mA
I_{R3}	2.30mA
I_{total}	3.92mA

What conclusions can be made from these results?

The total current is the summary of every branches.
The larger resistance it is, the smaller the current is.

ANSWER:

1. The sum of the total currents in parallel is equal to the sum of the branches

2. The ratio of the shunt current to each branch is equal to the reciprocal of the ratio of the resistance to each branch

Part 3.3

V_{R1}	5.08V
V_{R2}	5.07V
V_{R3}	5.08V

What conclusions can be made from these results?
The parallel resistors have the same voltage

ANSWER: The voltage of each branch of parallel current is equal