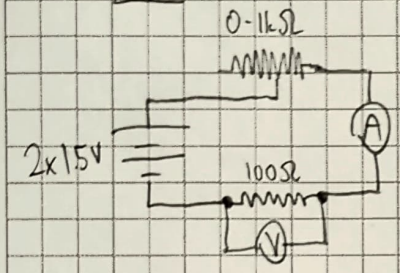
Trevor Nichols, Eli Lab #1 DC-CR PHYS 122-~~A~~ 119B

**D**

$V = IR$

$P = IV = I^2R = V^2/R$

Dg.1




$R = 99.5 \pm 0.1\ \Omega$

$A = 26.5 \pm 0.1$ nA $\quad V = 2.620 \pm 0.001$ V

$A = 21.4 \pm 0.1$ mA $\quad V = 2.118 \pm 0.001$ V

| A (mA) | V (V) |
|---|---|
| 21.4±0.1 | 2.118±0.001 |
| 22.3±0.1 | 2.207±0.001 |
| 23.2±0.1 | 2.299±0.001 |
| 24.1±0.1 | 2.389±0.001 |
| 25.1±0.1 | 2.482±0.001 |
| 26.5±0.1 | 2.620±0.001 |

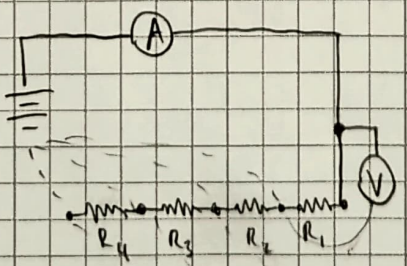
**E1**

$R_1 = 99.5 \pm 0.1\ \Omega$
$R_2 = 98.8 \pm 0.1\ \Omega$
$R_3 = 0.99 \pm 0.01\ k\Omega$
$R_4 = 47.1 \pm 0.01\ \Omega$

| # | Theoretical (Ω) | V (V) ±0.001 | I (mA) ±0.01 | $R_{eq}$ (Ω) | $\delta_R$ (Ω) |
|---|---|---|---|---|---|
| $R_1$ | $R_1$ 99.5 | 2.703 | 27.4 | 98.65 | ~~0.08~~ 0.05 |
| $R_{1,2}$ | $R_1+R_2$ 198.3 | 2.789 | 14.1 | 197.8 | 0.16 |
| $R_{1,2,3}$ | $R_1+R_2+R_3$ 1188.3 | 2.866 | 2.239 ~~2.24~~ ±0.001 | 1280.0 | 0.73 |
| $R_{1,2,3,4}$ | $R_1+R_2+R_3+R_4$ 1235.4 | 2.867 | ~~2.25~~ 2.161 ±0.001 | 1326.7 | 0.77 |

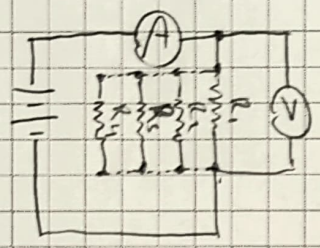
$R = \frac{V}{I}$

$\delta_R = \sqrt{\left(\frac{\delta_V}{I}\right)^2 + \left(\frac{V\delta_I}{I^2}\right)^2}$



Trevor Nichols, El: Lab #1 DC-CIR PHYS 122-119B

E2




$R_1 = 99.5 \pm 0.1\ \Omega$
$R_2 = 98.8 \pm 0.1\ \Omega$
$R_3 = 0.99 \pm 0.01\ k\Omega$
$R_4 = 47.1 \pm 0.01\ \Omega$

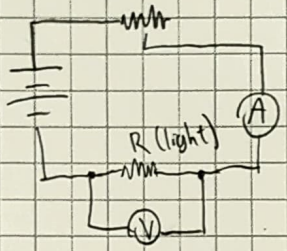
| # | (Ω) Theoretical | (V) V | (mA) I | (Ω) $R_{exp}$ | (Ω) $\delta_R$ |
|---|---|---|---|---|---|
| $R_1$ | 99.5 | 2.708 ±0.001 | 27.4 ±0.1 | 98.8 | 0.36 |
| $R_{1,2}$ | 49.57 | 2.548 ±0.001 | 51.7 ±0.1 | 49.28 | 0.097 |
| $R_{1,2,3}$ | 47.21 | 2.532 ±0.001 | 539 ±0.1 | 46.98 | 0.089 |
| $R_{1,2,3,4}$ | 23.58 | 2.259 ±0.001 | 96.4 ±0.1 | 23.43 | 0.026 |

$$R = \frac{V}{I}$$

$$\delta_R = \sqrt{\left(\frac{\delta V}{I}\right)^2 + \left(\frac{V \delta_I}{I^2}\right)^2}$$

F

$R = 1.7\ \Omega$
$\pm 0.1$




| $\pm 0.1$ I (mA) | $\pm 0.001$ V (V) | $R_{eq}$ ($\Omega$) |
|---|---|---|
| 75.6 | 0.097 | |
| 177.6 | 1.127 | |
| 85.9 | 0.124 | |
| 96.3 | 0.154 | |
| 106.5 | 0.203 | |
| 116.2 | 0.300 | |
| 126.8 | 0.463 | |
| 137.0 | 0.603 | |
| 147.1 | 0.731 | |
| 157.3 | 0.862 | |
| 167.3 | 0.994 | |

G

$P = 0.25\ W$
$R = 100\ \Omega$

$\frac{100\ \Omega}{4\ W} = V^2$

$V = 5V$

Rated at 25V

$R = 0.130\ M\Omega$

$\frac{130{,}000\ \Omega}{4\ W} = V^2$

$V = 180V$