

EE 271-Experiment # 1: Ohm's Law and Kirchhoff's Laws

Table 4. Color code for the 10 kΩ resistor (Figure 2 circuit).

| First | Second | Third | Fourth |
|-------|--------|-------|--------|
| | | | |

Table 5. Theoretical resistor, voltage and current values (Figure 2 circuit).

| R_{th} (kΩ) | V_{th} (V) | I_{th} (mA) |
|---------------|--------------|---------------|
| 10 | | |

Table 6. Power values calculated (Figure 2 circuit).

| P_R (mW) | P_S (mW) | Safe or not? | Energy conserved? |
|------------|------------|--------------|-------------------|
| | | | |

Table 7. Theoretical and measured resistor, voltage and current values (Figure 2 circuit).

| R_{th} (kΩ) | R_m (kΩ) | V_{th} (V) | V_m (V) | I_{th} (mA) | I_{pr} (mA) | I_m (mA) |
|---------------|------------|--------------|-----------|---------------|---------------|------------|
| | | | | | | |

Table 8. Percentage error in the actual value of the 10 kΩ resistor (Figure 2 circuit).

| R_{th} (kΩ) | R_m (kΩ) | % error | Less than tolerance value? |
|---------------|------------|---------|----------------------------|
| 10 | | | |

Table 9. Percentage error in current values (Figure 2 circuit).

| % error with respect to I_{th} | % error with respect to I_{pr} |
|----------------------------------|----------------------------------|
| | |

Table 10. Power values calculated (Figure 2 circuit).

| P_R (mW) | P_S (mW) | Energy conserved? |
|------------|------------|-------------------|
| | | |

Table 11. Color codes for the 1.8 & 4.7 kΩ resistors (Figure 3 circuit).

| R (kΩ) | First | Second | Third | Fourth |
|----------|-------|--------|-------|--------|
| 1.8 | | | | |
| 4.7 | | | | |

Table 12. Theoretical and measured values of the resistors (circuit in Figure 3).

| $R_{1,th}$ (kΩ) | $R_{1,m}$ (kΩ) | $R_{2,th}$ (kΩ) | $R_{2,m}$ (kΩ) | $R_{3,th}$ (kΩ) | $R_{3,m}$ (kΩ) |
|-----------------|----------------|-----------------|----------------|-----------------|----------------|
| 10 | | 4.7 | | 1.8 | |

Table 13. Percentage error in the values of 1.8 and 4.7 kΩ resistors (Figure 3 circuit).

| R (k Ω) | % error | Less than tolerance value? |
|-------------------|---------|----------------------------|
| 1.8 | | |
| 4.7 | | |

Table 14. Measured voltage and current values (circuit in Figure 3).

| V_1 (V) | V_2 (V) | V_3 (V) | I (mA) | % KVL error | KVL satisfied? |
|-----------|-----------|-----------|----------|-------------|----------------|
| | | | | | |

Table 15. Percentage errors in current values (circuit in Figure 3).

| $I_{1,pr}$ (mA) | $I_{1,m}$ (mA) | % error in I_1 | $I_{2,pr}$ (mA) | $I_{2,m}$ (mA) | % error in I_2 | $I_{3,pr}$ (mA) | $I_{3,m}$ (mA) | % error in I_3 |
|-----------------|----------------|------------------|-----------------|----------------|------------------|-----------------|----------------|------------------|
| | | | | | | | | |

Table 16. Measured current values (circuit in Figure 4).

| I_1 (mA) | I_2 (mA) | I_3 (mA) | % error in I_1 |
|------------|------------|------------|------------------|
| | | | |