EECE 2150 - Electrical Engineering Fall 2021
Quiz 1

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Student Name: _____

On the next page is a circuit to power some light–emitting diodes, which was part of a laboratory experiment. When I did this experiment, I measured the resistors and found them both to be 480 Ohms and the voltages were;

R_1 and R_2	4.70	V
Yellow $LED1$	1.99	V
Red $LED2$	2.20	V
"9 Volt Source"	8.95	V

1. Is Kirchoff's Voltage Law closely satisifed? What is the voltage error?

_____ _____

2. The resistors were identified as having a 10% tolerance. Are they within tolerance?

_____

3. What is the current through one of the resistors?

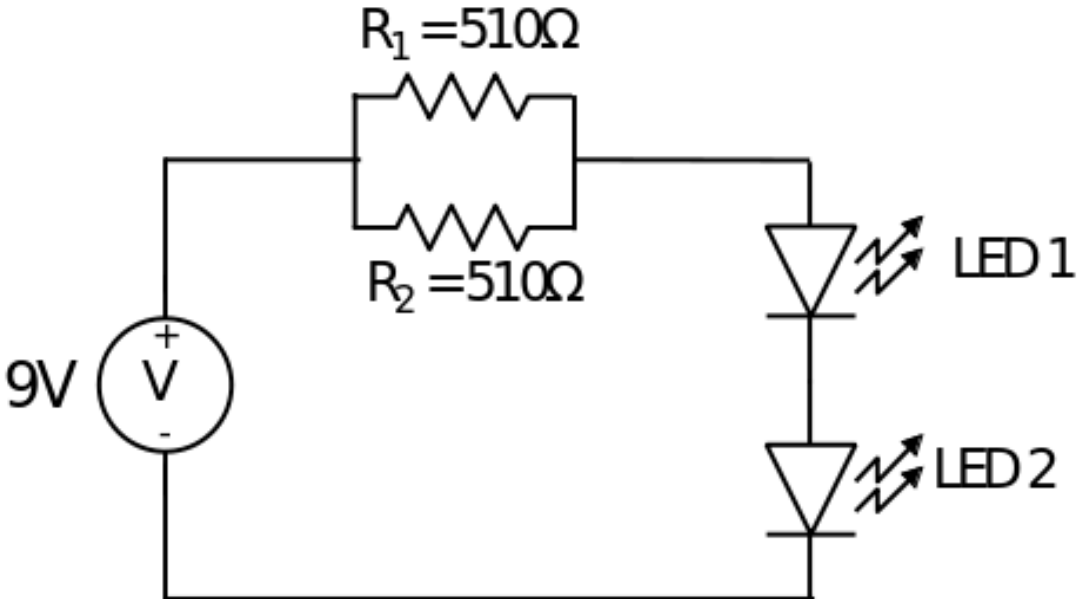
_____

4. What is the power absorbed by each resistor?

_____

5. If the resistors are rated to absorb 1/8 Watt without damage, how much margin of safety is there?

_____


R1 =510Ω
R2 =510Ω
LED 1
LED 2
9V
V
+
-

Solution

1.4.7+1.99+2.20 = 8.89V. Error is 0.06 V, which is small compared to all voltages in the circuit.

2. Yes. 480/510 = 0.94 for a 6% error.

3. The current through one resistor is

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

$$\frac{4.70\,\mathrm{V}}{480\,\mathrm{Ohms}} = 0.0098\,\mathrm{A}$$

so the current is 9.8 mA.

4. The power is $P = IV$ so for one resistor,

$$P = 4.70\,\mathrm{V} \times 0.0098\,\mathrm{A} = 0.046\,\mathrm{W}$$

5. This power is 0.046/(1/8) = 0.37 of the maximum allowed.