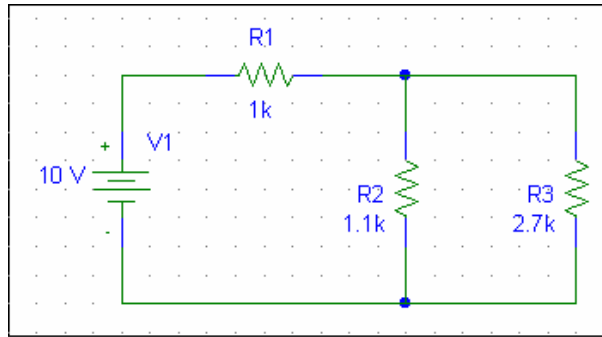


LAB #11: Series-Parallel Circuits

In this lab all the knowledge acquired thus far will be used to analyze Series-Parallel circuits. Remember to show all calculations and use complete sentences when answering questions.

PART I

Given:



1. Calculate the following quantities: (10 pts)

$R_{eq1} = R2 \parallel R3 =$ _____ $R_T = R_{eq1} + R1 =$ _____

$I_T =$ _____ $I_{R2} =$ _____

$I_{R3} =$ _____ $V_{R3} =$ _____

$P_{R1} =$ _____ $P_{R2} =$ _____

$P_{R3} =$ _____ $P_T =$ _____

2. Make the following measurements: (9 pts)

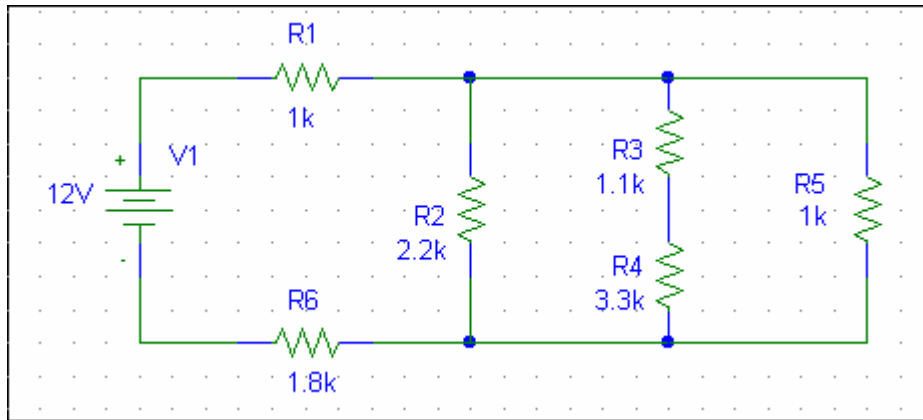
(Remember to disconnect the power supply to measure the resistance)

	R	V	I
R1			
R2			
R3			

3. What is the Total Resistance if a 5.6 kΩ resistor is added in parallel to R3? (3 pt)

PART II

Construct the following circuit:



1. Complete the following table with measurements. (27 pts)

	R	V	I	P
R1				
R2				
R3				
R4				
R5				
R6				
RT =			IT =	PT =

2. If $5.6\text{ k}\Omega$ is added in parallel to **R6** what is the Total Resistance? (3 pts)

PART III: DESIGN (48 pts)

Design a series-parallel circuit that obeys the following constraints: (10pts)

1. V_s cannot exceed 12V.
2. One of the resistors must be 4.7 k Ω .
3. The Total Resistance can not exceed 4.7k Ω and can not be less than 500 Ω .
4. Circuit must use five resistors (including the 4.7 k Ω) that are available in the lab.
5. Circuit must have at least one Parallel Branch.
6. Power Ratings for each resistor using the 50% Design Rule should be $\frac{1}{4}$ W or less.
7. Show all calculations for full credit.
8. Sketch the schematic below.

1. Write all of the calculated values in the following table. (10 pts)

	R	V	I	P
R1				
R2				
R3				
R4				
R5				

$I_T =$ _____

$R_T =$ _____

$P_T =$ _____

2. Simulate the circuit in Pspice, **include** the results in the lab report. (5 pts)

3. Do your simulation results meet the constraints? Why? (2 pt)

4. Build your circuit and fill out the table below with your measurements. (15 pts)
REMEMBER TO USE THE CORRECT POWER RATINGS!

	R	V	I
R1			
R2			
R3			
R4			
R5			

5. Demonstrate two (2) random measurements of your circuit to the instructor. (6 pts)

Instructor's Initials: _____

Date: _____