

Experiment 7

Nodal and Mesh Analyses

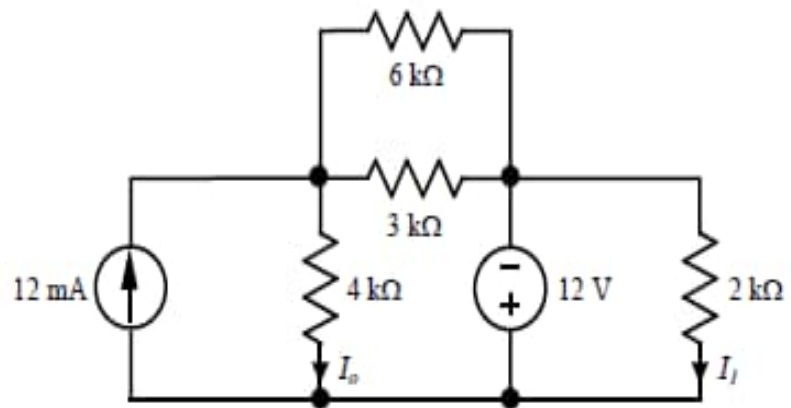
Name	Group	Grade
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Objectives:

1. To apply mesh and nodal techniques to circuit analysis.
2. To verify experimentally the results of mesh and nodal analyses.

Pre-Lab

Find I_0 and I_1 using nodal analysis in the circuit shown.

Solution:**The experiment**

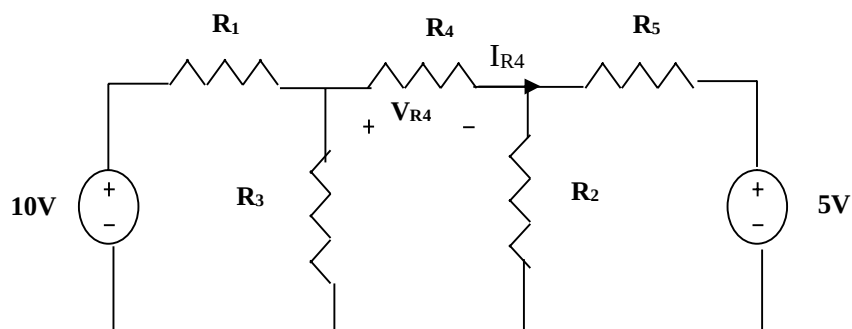
1. You are given 5 resistors. Identify the band colors and find the resistance of each resistor. Also, measure the resistance of each resistor. Sort the resistances in ascending order with R_1 being the smallest resistance and R_5 the largest.
2. For the circuit shown below:

- Use nodal analysis to calculate and record the values of V_1 , V_2 . Deduce the values of I_{R3} and V_{R3} .
 - Use mesh analysis to calculate and record the values of I_1 , I_2 and I_3 . Deduce the values of I_{R3} and V_{R3} .
- Connect the circuit. Measure and record all the values calculated previously in Table 1.
 - Calculate percent errors as (for example I):

$$Error\% = \frac{|I_{calculated} - I_{measured}|}{I_{calculated}} \times 100$$

Table 1

Method	Quantity	Measured	Calculated	Percent error (%)
Nodal analysis	V_1			
	V_2			
	V_{R4}			
	I_{R4}			
Mesh analysis	I_1			
	I_2			
	I_3			
	V_{R4}			
	I_{R4}			



Calculations

Nodal analysis:

Mesh analysis:

Conclusion

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