



Shri Vile Parle Kelavani Mandal's

DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING

(Autonomous College Affiliated to the University of Mumbai)

NAAC Accredited with "A" Grade (CGPA : 3.18)



First Year (Semester I) B.Tech.

Basic Electrical and Electronics Engineering

Experiment No. : 02

Mesh and Nodal Analysis

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Date of performance : 13-03-2021

Signature of teacher-in-charge : _____



First Year (Semester I) B.Tech.

Aim:	To determine mesh currents and nodal voltages in the given circuit.
Apparatus :	Online simulation tools (Suggested Tinkercad)
Theoretical Analysis:	<div data-bbox="540 558 1258 907" data-label="Diagram"></div> <p style="text-align: center;">Fig. 1(a) Mesh Analysis</p> <p><u>Theoretical Calculations:</u></p> <div data-bbox="448 1108 1284 1890" data-label="Image"></div>



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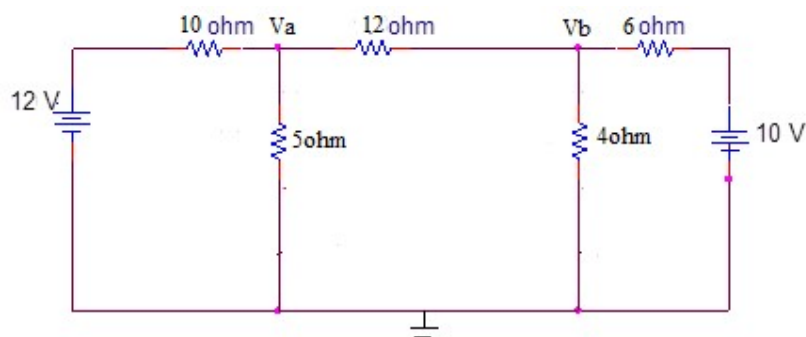
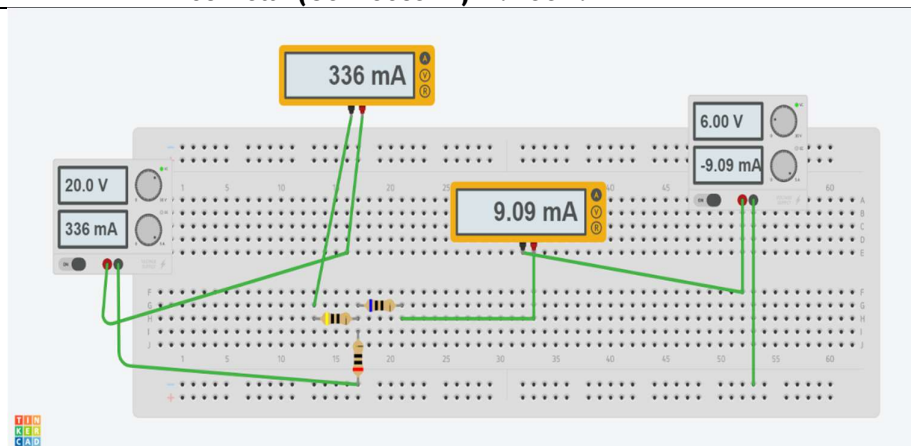


Fig. 1(b) Nodal Analysis

Theoretical Calculations:

KCL at A,

$$\frac{V_A - 12}{10} + \frac{V_A}{5} + \frac{V_A - V_B}{12} = 0$$

$$5V_A - 72 + 12V_A + 5V_A - 5V_B = 0$$

$$23V_A - 5V_B = 72 \quad (1)$$

KCL at B,

$$\frac{V_B - V_A}{12} + \frac{V_B}{4} + \frac{V_B - 10}{6} = 0$$

$$2V_B - 2V_A + 3V_B + 2V_B - 20 = 0$$

$$-2V_A + 7V_B = 20 \quad (2)$$

$$V_A = V_B = 4V$$



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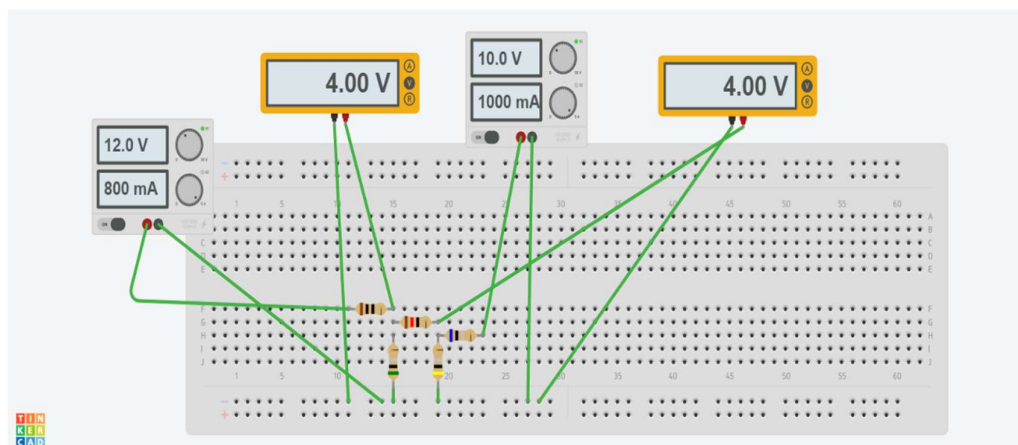


Table	Mesh currents	Theoretical Values	Observation Values
	i1 (A)	336 mA	336 mA
	i2 (A)	9.09 mA	9.09 mA

Table	Nodal voltages	Theoretical Values	Observation Values
	Va (V)	4 V	4 V
	Vb (V)	4 V	4 V

Conclusion:

1. We used Mesh analysis to find the values of current .
2. We used Nodal analysis to find the values of voltages .
3. For calculating the practical values ; we used an online simulation tool called Tinkercad
4. The Practical and Theoretical values when measured were found to be equal.