DEPT. OF ELECTRICAL & ELECTRONICS ENGINEERING

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY, Kattankulathur – 603 203

Title of Experiment	: **1. Verification of Kirchhoff's Laws**
Name of the candidate	:
Register Number	:
Date of Experiment	:

Sl. No.	Marks Split up	Maximum marks (50)	Marks obtained
1	Pre Lab questions	5	
2	Preparation of observation	15	
3	Execution of experiment	15	
4	Calculation / Evaluation of Result	10	
5	Post Lab questions	5	
	Total	**50**	

Staff Signature

PRE LAB QUESTIONS

1. Define Ohm's law.

2. State KCL and KVL.

3. Define absolute potential and potential difference

4. What is the difference between mesh and loop?

5. What is super-node?

Experiment No. 1 Date :	VERIFICATION OF KIRCHOFF'S LAWS

Aim:

To verify Kirchhoff's current law and Kirchhoff's voltage law for the given circuit.

Apparatus Required:

Sl.No .	Apparatus	Range	Quantity
1	RPS (regulated power supply)	(0-30V)	2
2	Resistance	330Ω, 220Ω 1kΩ	6
3	Ammeter	(0-30mA)MC	3
4	Voltmeter	(0-30V)MC	3
5	Bread Board & Wires	--	Required

Statement:

KCL: The algebraic sum of the currents meeting at a node/junction is equal to zero.

KVL: In any closed path / mesh, the algebraic sum of all the voltages is zero.

Precautions:
1. Voltage control knob should be kept at minimum position.
2. Current control knob of RPS should be kept at maximum position.

Procedure for KCL:
1. Give the connections as per the circuit diagram.
2. Set a particular value in RPS.
3. Note down the corresponding ammeter reading
4. Repeat the same for different voltages

Procedure for KVL:
1. Give the connections as per the circuit diagram.
2. Set a particular value in RPS.
3. Note all the voltage reading
4. Repeat the same for different voltages

HARDWARE SETUP:

<u>Circuit for KCL verification:</u>
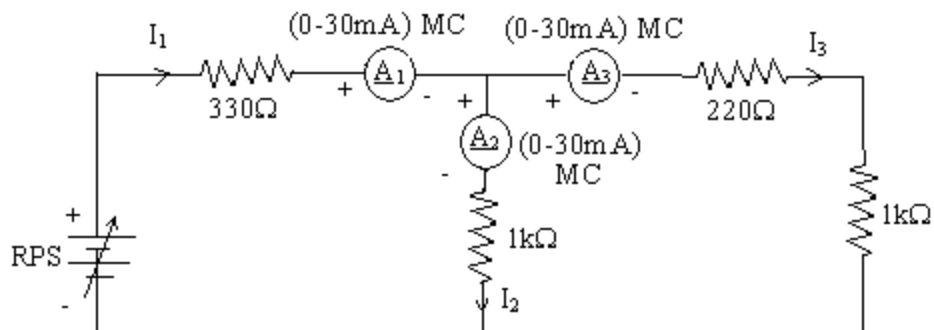
<u>Circuit for KVL verification:</u>
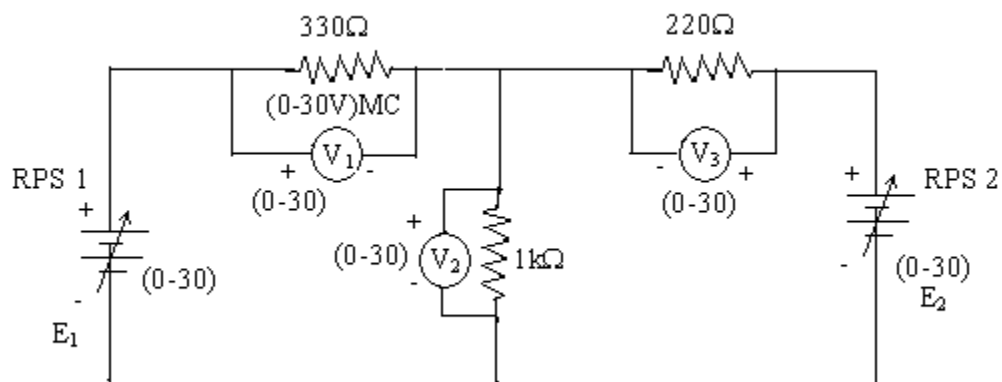
KCL - Theoretical Values:

Sl. No.	Voltage E	Current			$I_1 = I_2 + I_3$
		I_1	I_2	I_3	
	Volts	mA	Ma	mA	mA
1	5	0.00568	0.00312	0.00256	0.00568
2					
3					
4					
5					

KCL - Practical Values:

Sl. No.	Voltage E	Current			$I_1 = I_2 + I_3$
		I_1	I_2	I_3	
	Volts	mA	mA	mA	mA
1	5	33.33	16.66	16.67	33.33
2					
3					

KVL – Theoretical Values

Sl.No.	RPS		Voltage			KVL
	E_1	E_2	V_1	V_2	V_3	$E_1 = V_1 + V_2$
	V	V	V	V	V	V
1						
2						
3						
4						
5						

KVL - Practical Values

Sl.No.	RPS		Voltage			KVL
	E_1	E_2	V_1	V_2	V_3	$E_1 = V_1 + V_2$
	V	V	V	V	V	V
1						
2						
3						

Model Calculations:

Result:

POST LAB QUESTIONS

1) **Illustrate KCL and KVL.**

2) **Express the limitations of Ohm's law?**

3) **What is the practical application of Kirchhoff's law?**

4) **Compare series and parallel circuits**

5) **What is the difference between series and parallel connection of batteries?**