

## **Practical-2 KVL**

### **Aim:**

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

### **Apparatus Required:**

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

### **Statement:**

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

### **Precautions:**

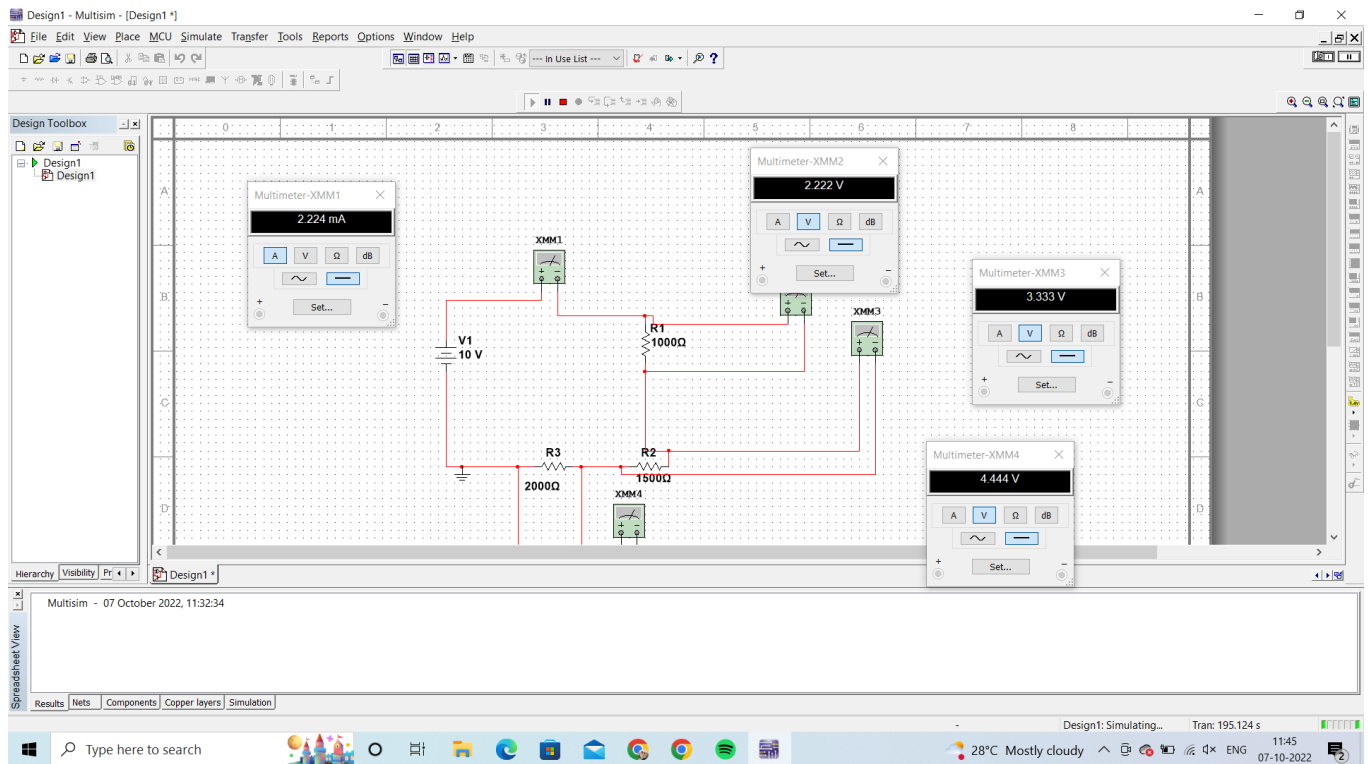
- Voltage control knob should be kept at minimum position.
- Current control knob of RPS should be kept at maximum position.

### **Procedure for KVL:**

- Give the connections as per the circuit diagram.
- Set a particular value in RPS.
- Note all the voltage reading
- Repeat the same for different voltages

### **HARDWARE SETUP:**

### **Circuit for KVL verification:**



As per given in lab session

### KVL - Theoretical Values:

Sl.No.	RPS		Voltage			Error
	E1	E2	V1	V2	V3	$V - V_t$
	V	V	V	V	V	V
1	10.04		9.62	0.207	0.206	$10.04 - 10.033 = 0.007$
2	5		0.1027	4.78	0.1038	$5 - 4.98 = 0.02$

### KVL - Practical Values:

Sl.No.	RPS		Voltage			KVL
	E1	E2	V1	V2	V3	$E1 = V1 + V2 + V3$
	V	V	V	V	V	V
1	20		3.333	6.667	10	$3.333 + 6.667 + 10 = 20$
2	10		1.667	3.333	5	$1.667 + 3.333 + 5 = 10$
3	5		0.833	1.667	2.5	$0.833 + 1.667 + 2.5 = 5$

## **Practical-3 KCL**

### **Aim:**

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

### **Apparatus Required:**

Sl.No.	Apparatus	Range	Quantity
1	RPS (regulated power supply)	(0-30V)	2
2	Resistance	3k $\Omega$ , 2k $\Omega$ 1k $\Omega$	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.

### **Precautions:**

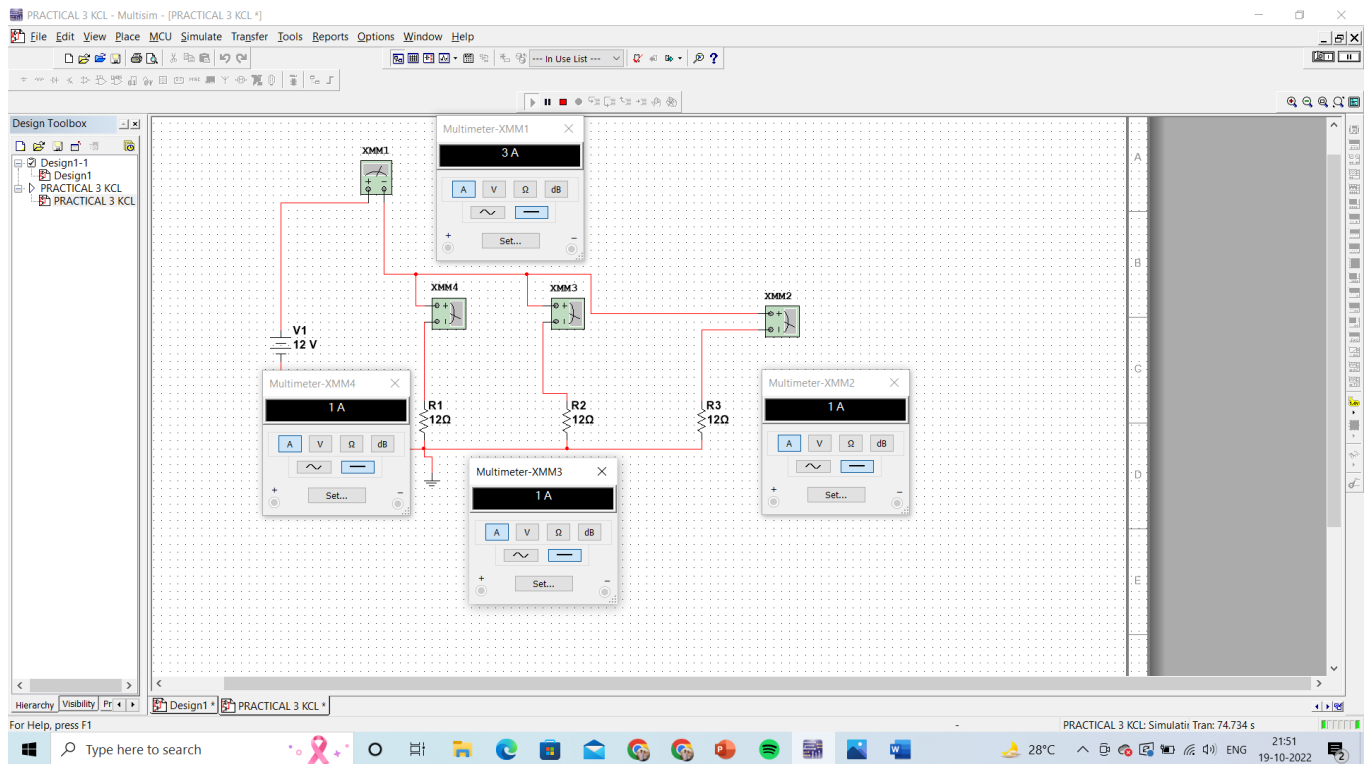
- Voltage control knob should be kept at minimum position.
- Current control knob of RPS should be kept at maximum position.

### **Procedure for KCL:**

- Give the connections as per the circuit diagram.
- Set a particular value in RPS.
- Note down the corresponding ammeter reading
- Repeat the same for different voltages

### **HARDWARE SETUP:**

### **Circuit for KCL verification:**



As per given in lab session

**KCL - Theoretical Values:**

Sl. No.	Voltage E	Current			Error
		I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	
	Volts	mA	mA	mA	mA
1	10	0.2	1	1.01	0.02
2	5	0.1	0.5	0.5	0.01

**KCL - Practical Values:**

Sl. No.	Voltage E	Current			I=I <sub>1</sub> +I <sub>2</sub> +I <sub>3</sub>
		I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	
	Volts	mA	mA	mA	mA
1	20	20.002	9.997	6.668	36.667
2	10	10.001	4.999	3.334	18.334
3	5	5	2.499	1.667	9.166

