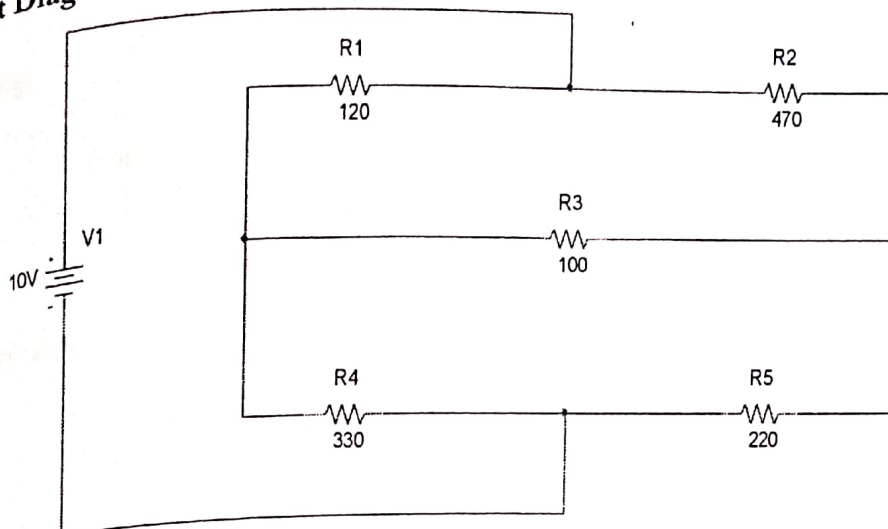


Verification of Thevenin's Theorem

Aim: To verify Thevenin's Theorem for given network by theoretical and experimental values.

Circuit Diagram



Apparatus/Tool required:

Sl. No.	Components Name	Range	Quantity
1	Resister	120Ω, 330Ω, 470Ω, 220Ω, 100Ω	Each 1 No.
2	Ammeter	0-50mA (DC)	1 No.
3	Voltmeter	0-10V (DC)	1 No.
4	RPS	0-32 V (DC)	1 No.
5	Connecting Wires	-	Few
6	Bread Board	-	1 No.

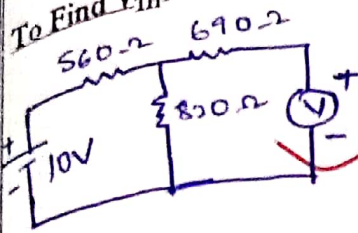
Theory

Statement: Thevenin's Theorem

The linear bilateral network ~~can~~ with output terminals A and B can be replaced by single voltage source in series with equivalent resistance.

Hardware Circuit:

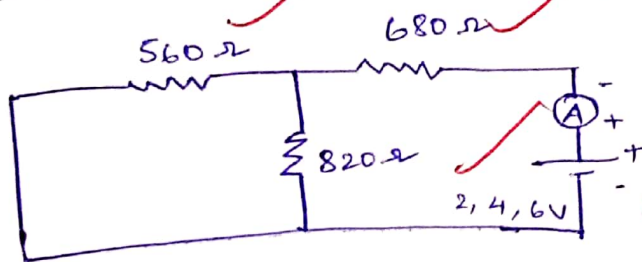
To Find V_{TH} :



Reading:

Applied Voltage (Volts)	V_{TH} (Volts)
10	5.48

To Find R_{TH} :

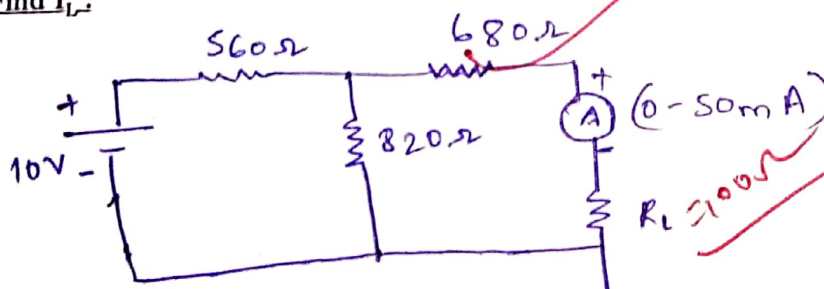


Reading:

Applied Voltage	Voltmeter Reading	Ammeter Reading	$R_{TH} = V/I$ ohms
2	2	2 mA	1000
4	4	4 mA	1000
6	6	6 mA	1000

Average of $R_{TH} = 1000$ Ohms.

To Find I_L :

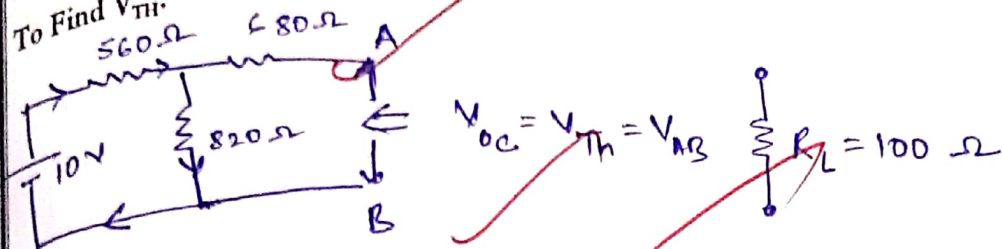


Reading:

Applied Voltage (Volts)	Ammeter Reading (Amps)
10	5×10^{-3}

Manual Calculations:

To Find V_{Th} :

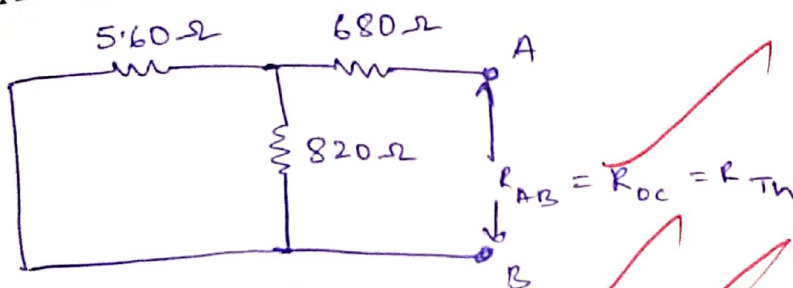


$$I = \frac{V}{R_{Th}} = \frac{10}{560 + 720} = 7.2 \text{ mAmps}$$

$$I = 7.2 \times 10^{-3} \text{ Amps}$$

$$\begin{aligned} V_{Th} = V_{OC} = V_{AB} &= I_{820} \times R \\ &= 7.2 \times 10^{-3} \times 820 \\ &= 5.9 \text{ Volts} \end{aligned}$$

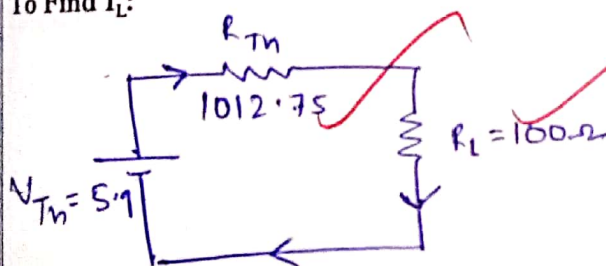
To Find R_{Th} :



$$\begin{aligned} R_{Th} = R_{AB} &= (560 \parallel 820) + 680 \\ &= \frac{560 \times 820}{560 + 820} + 680 \end{aligned}$$

$$R_{Th} = 1012.75 \Omega$$

To Find I_L :



$$\begin{aligned} I_L &= \frac{V_{Th}}{R_{Th} + R_L} \\ &= \frac{5.9}{1012.75 + 100} \end{aligned}$$

$$I_L = 5.3 \text{ mA}$$

Result: The Thevenin's Theorem has been verified for the given network. by theoretically and experimentally and the following results are tabulated :—

Manual Calculations

PARAMETERS

THEORITICAL
VALUES

Practical Output

EXPERIMENTAL
VALUES

V_{th}

5.9V

5.48V

R_{th}

1012.75 Ω

1000 Ω

I_L

5.3mA

5mA

Inference:

Reg. No: 19BCE2074

Name: KULVIR SINGH

Date: 8.8.19