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Date: 1-09-2022

Experiment No.4

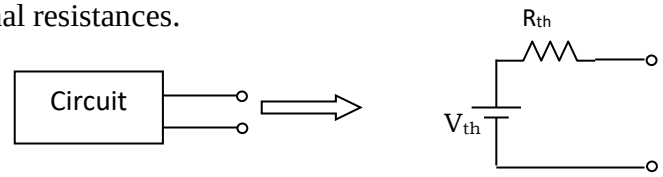
Verification of Thevenin's theorem

Objective:

To design a simplified equivalent circuit in analysing the power systems and other circuits where the load resistor is subject to change in order to determine the voltage across it and current through it using Thevenin's theorem.

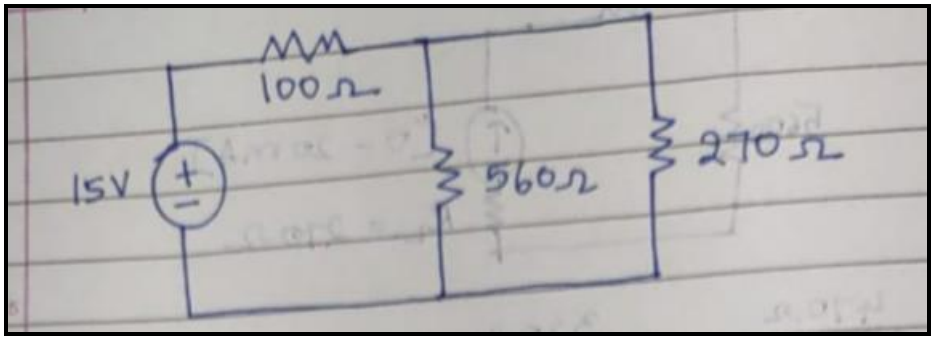
Statement of the theorem:

Any two-terminal linear network composed of voltage sources, current sources, and resistors, can be replaced by an equivalent two-terminal network consisting of an independent voltage source in series with a resistor. The value of voltage source is equivalent to the open circuit voltage (V_{th}) across two terminals of the network and the resistance is equal to the equivalent resistance (R_{th}) measured between the terminals with all energy sources replaced by their internal resistances.

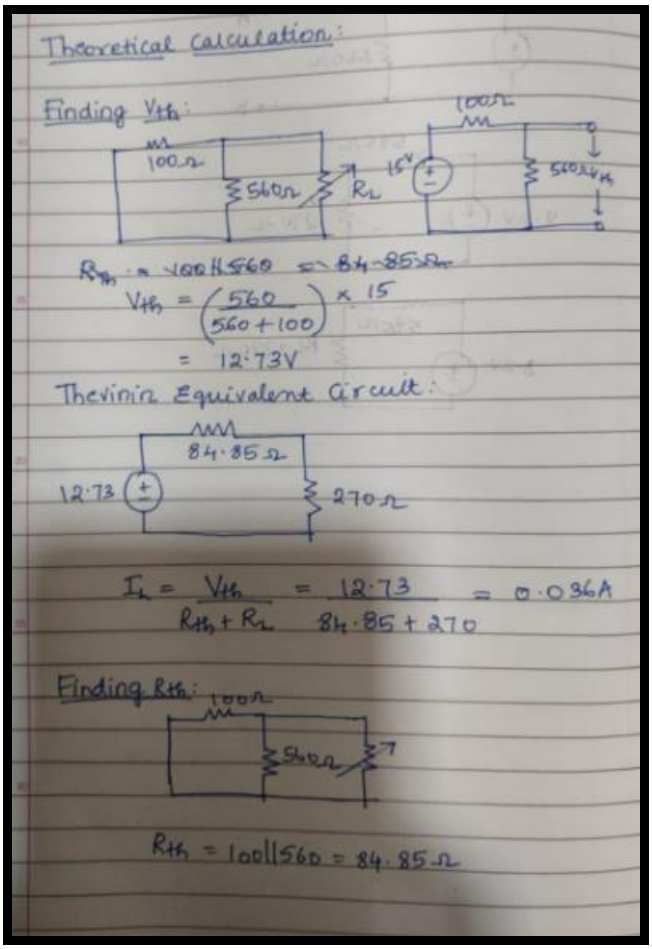


I.Simulation results

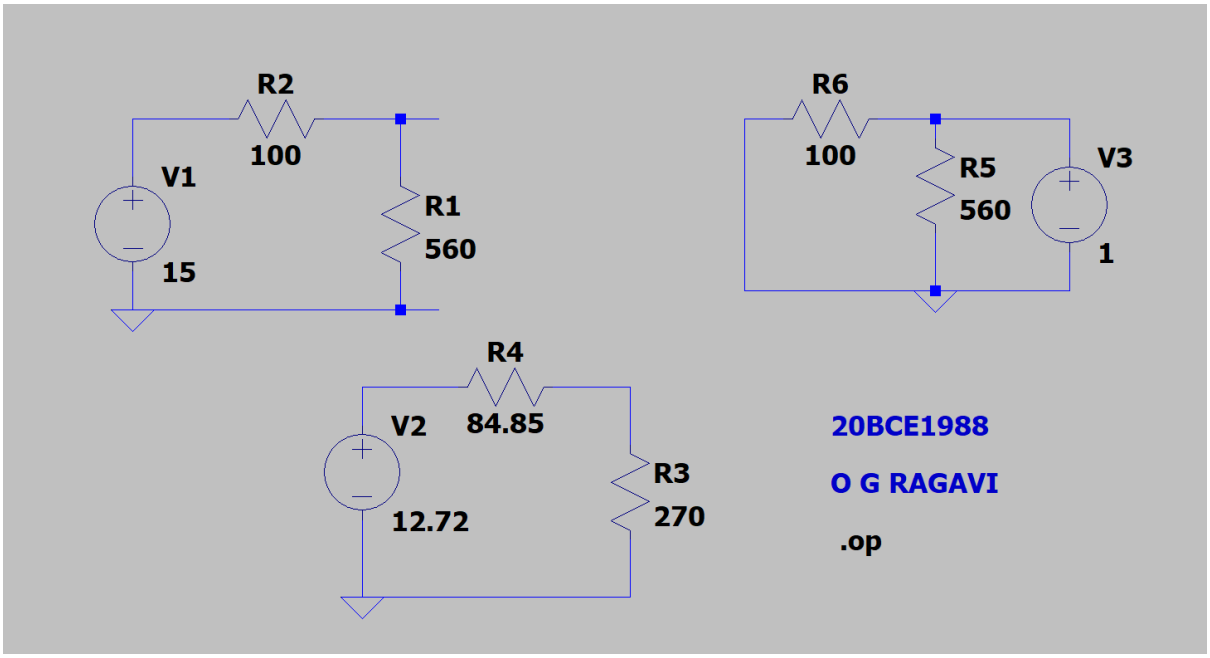
1. **Include your theoretical Circuit diagram here:**



2. Theoretical calculation:



3. Simulation:



* C:\Users\ragav\OneDrive\Documents\LTspiceXVII\Draft2.asc

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        --- Operating Point ---

V(n001):        15              voltage
V(n002):        12.7273         voltage
V(n004):        12.72           voltage
V(n005):        9.67846         voltage
V(n003):        1               voltage
I(R6):          0.01            device_current
I(R5):          0.00178571      device_current
I(R4):          -0.0358461      device_current
I(R3):          0.0358461       device_current
I(R2):          -0.0227273      device_current
I(R1):          0.0227273       device_current
I(V3):          -0.0117857      device_current
I(V2):          -0.0358461      device_current
I(V1):          -0.0227273      device_current
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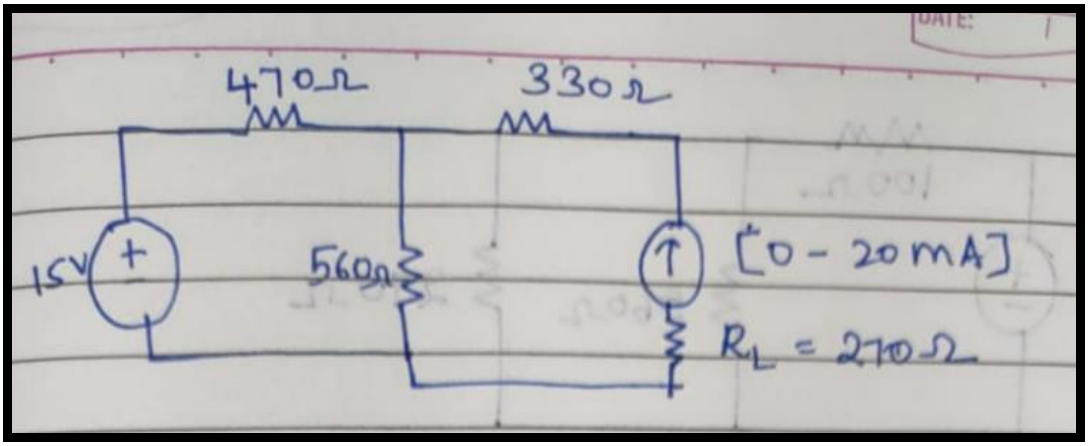
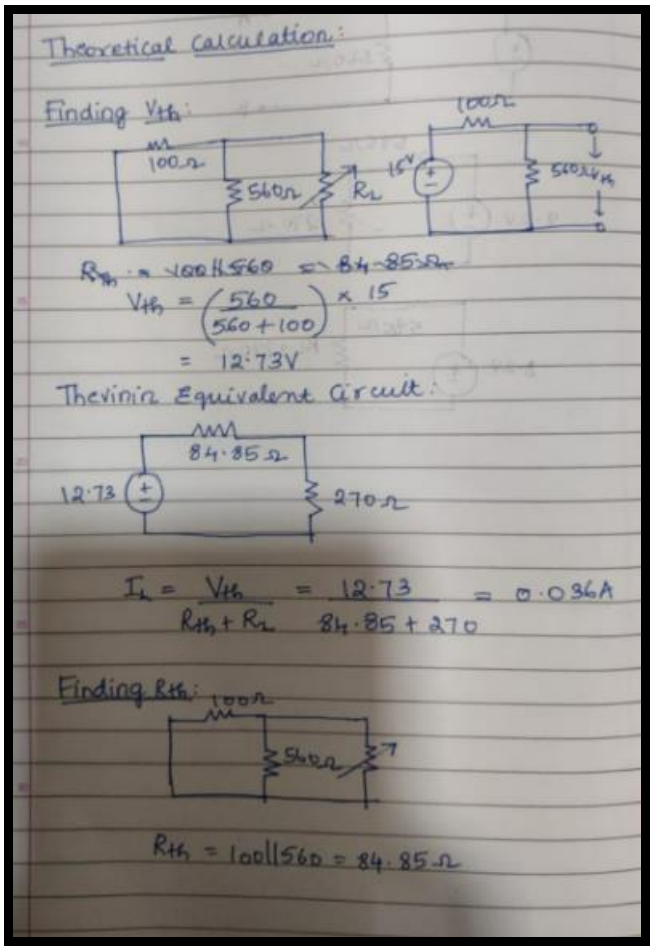
II. Hardware Experiment results

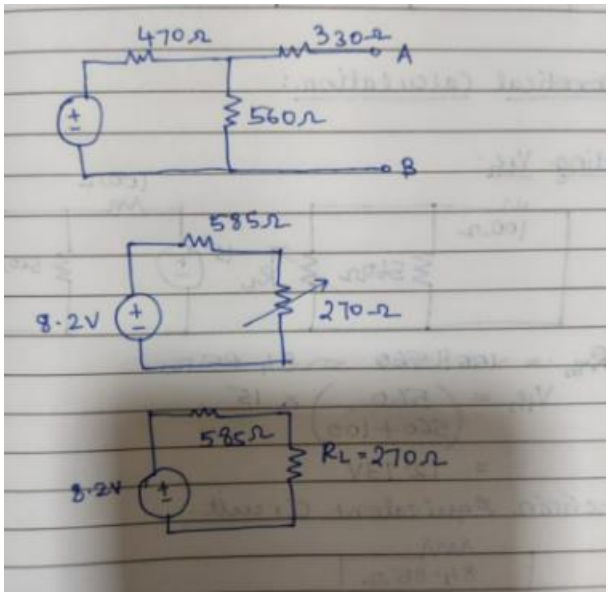
1. Include your theoretical Circuit diagram here:



2. Theoretical calculation:



3. Experiment:



Result:

Thus Thevenin's theorem has been verified both by simulation and experimentation.