Basic Electrical and Electronics Engineering Lab (BEEE102P)

EXPERIMENT 2

Dr. Sonam Shrivastava/ Assistant Professor (Sr.) /SELECT

BEEE102P
Basic Electrical and Electronics Engineering Lab
List of Experiments

S.No	Experiment Title
	Cycle-1 Software Experiments
1	Verification of Mesh current analysis and node voltage analysis using ORCAD/Capture CIS
2	Verification of Thevenin's theorem using ORCAD/Capture CIS
3	Verification of Maximum power transfer theorem using ORCAD/Capture CIS
4	Verification of Resonance phenomenon in a series RLC circuit using ORCAD/Capture CIS using AC Parametric Sweep Analysis
5	Design of single-phase half-wave and full wave rectifier
	Cycle-II Hardware Experiments
6	Verification of Kirchhoff's current law
7	Wiring circuit for Single lamp and Fan with regulator/ Staircase wiring circuit layout of multi storage building
8	Design of half adder circuit using logic gates
9	Measurement of energy using single phase energy meter
10	Design of regulated power supply using Zener diode

Verification of Thevenin's theorem

EXPERIMENT 2

Verification of Thevenin's theorem using ORCAD/Capture CIS

Aim: To verify Thevenin's theorem by computing load current and voltage of a given DC circuit

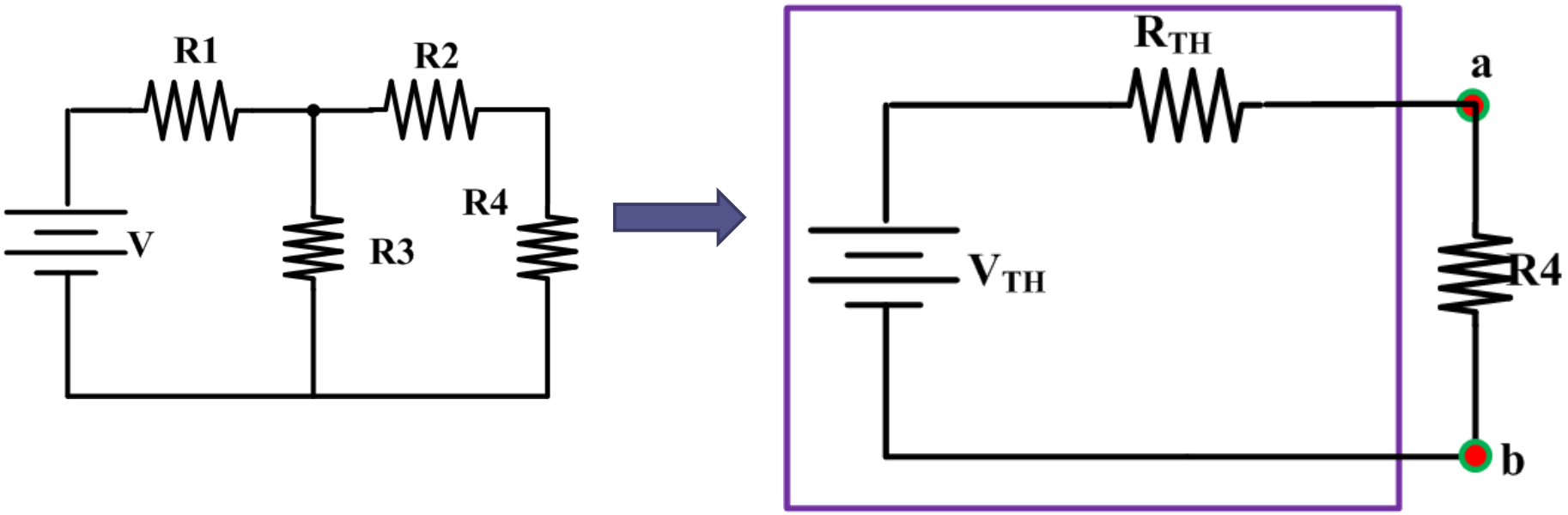
Apparatus Required:

S.No	Component/part in ORCAD	Value	Path in the directory
1	DC Voltage source		PSPICE\SOURCE\VDC
2	DC current source		PSPICE\SOURCE\IDC
3	Resistors		PSPICE\ANALOG\R
4			
5			
6			
7			
8			
7	Ground		Place >> Ground

Analysis Type: Bias point

Theory:

Thevenin's Theorem



A linear, active, resistive network which contains one or more voltage or current sources can be replaced by a single voltage source and a series resistance. The voltage is called the Thevenin's equivalent voltage, V_{TH} and series resistance is called the Thevenin's equivalent resistance, R_{TH}.

Procedural Steps for obtaining Thevenin circuit

To find the Thevenin's voltage V_{TH} :

1. **Remove the load resistor (R_L) and keep the terminals open.**
2. **Analyze the circuit to find the voltage across open terminals of the load resistance (open circuit voltage).**
3. **The voltage across open terminals of the load resistance is called Thevenin's voltage.**

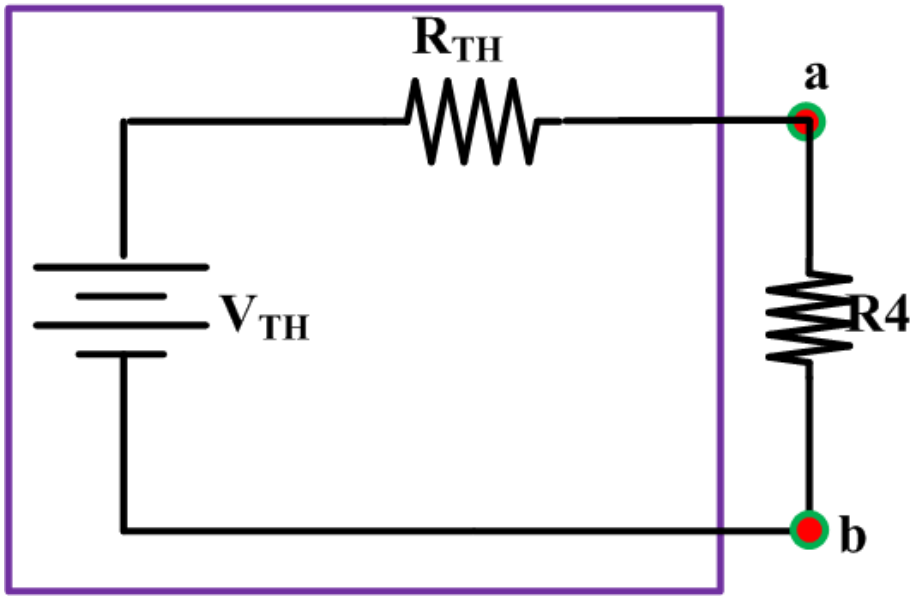
Procedural Steps for obtaining Thevenin circuit

To find the Thevenin's resistance R_{TH} :

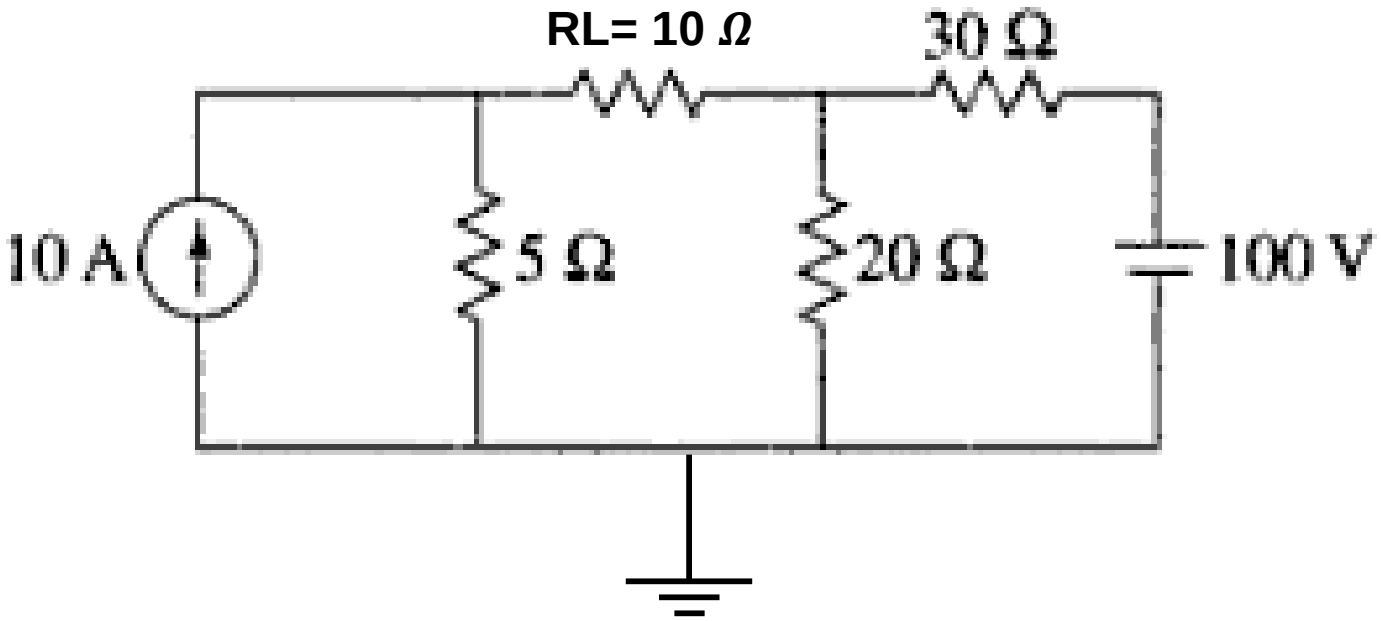
1. **Make the all independent sources dead. Replace all the independent voltage sources with short circuit and all the independent current sources with the open circuit.**
2. **Remove the load resistor (R_L) and find the equivalent circuit resistance by looking from the open terminals of the load resistance.**
3. **The computed resistance is called Thevenin's resistance, R_{TH}**

- **Draw the Thevenin's equivalent circuit with Thevenin's voltage connected in series with the Thevenin's resistance.**

- **Connect the load resistance in series with the Thevenin's resistance.**



- **Compute the current flowing through the load resistance.**


RL= 10 Ω
30 Ω
10 A
5 Ω
20 Ω
100 V

Thevenin's Theorem circuit diagram