

**IARE****INSTITUTE OF
AERONAUTICAL ENGINEERING**(An Autonomous Institute affiliated to JNTU, Hyderabad)
Dundigal, Hyderabad - 500 043**LABORATORY WORK SHEET**Name of the Student: MADKI SAI CHARANClass: C5M-'C' Semester: IstCourse Code: AEEPO3 Course Name: Electrical and Electronics Engineering LaboratoryName of the Course Faculty: Ms. M. VARALAKSHMI Faculty ID: IARE 11072Exercise Number: 04 Week Number: 04 Date: 24 November 2023**DAY TO DAY EVALUATION:**

Marks	Aim / Preparation	Algorithm / Procedure	Source Code	Program Execution	Viva - Voce	Total
		Performance in the Lab	Calculations and Graphs	Results and Error Analysis		
Max. Marks	4	4	4	4	4	20
Obtained	4	4	4	4	4	20

Signature of Faculty

START WRITING FROM HERE :

Aim : To verify thevenin's theorem for an electrical circuit theoretically and practically.

Apparatus:

S. No	Equipment	Range	Type	Quantity
01.	Ammeter	(0-200 mA)	MC	01
02.	Voltmeter	(0-20V)	DC	01
03.	RPS	(0-230V)	Digital	01
04.	Bread Board	-	-	01
05.	Resistors	82 Ω , 47 Ω , 150 Ω , 100 Ω	Carbon fibre	04
06.	Connecting Wires	-	-	As required.

Statement: Any linear, Bilateral network having a no. of voltage current sources and resistors can be replaced by a simple equivalent circuit consisting of a single voltage in series with a resistance's, the equivalent resistance measured between the open circuit terminals with all energy sources replaced by their ideal internal resistance.

Circuit Diagram:

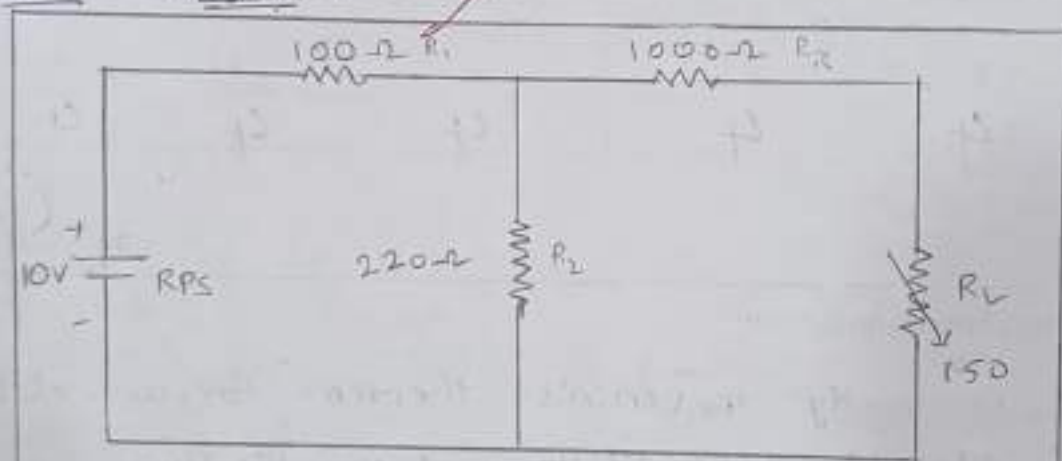


fig (1) Basic circuit

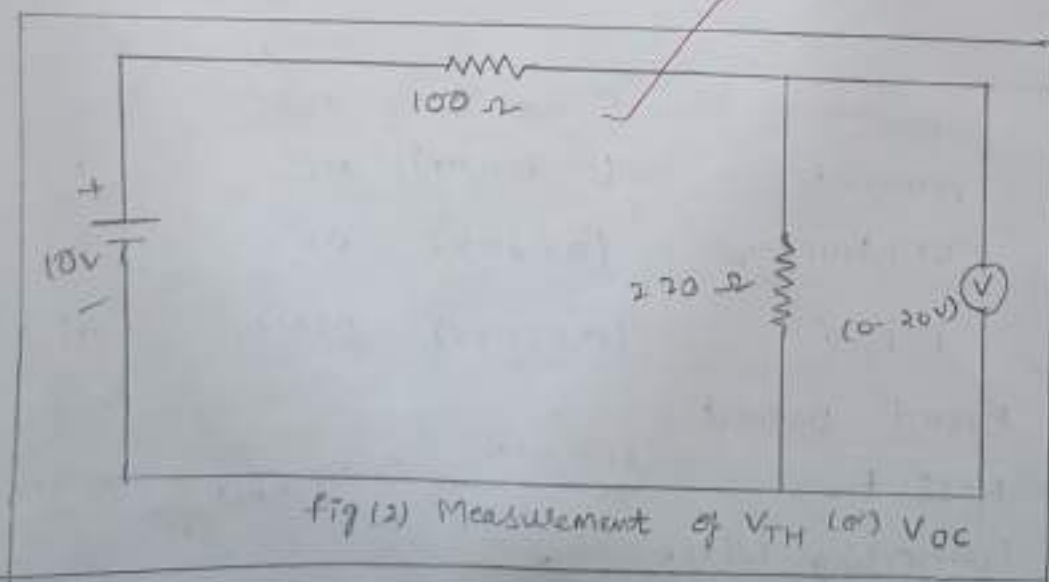
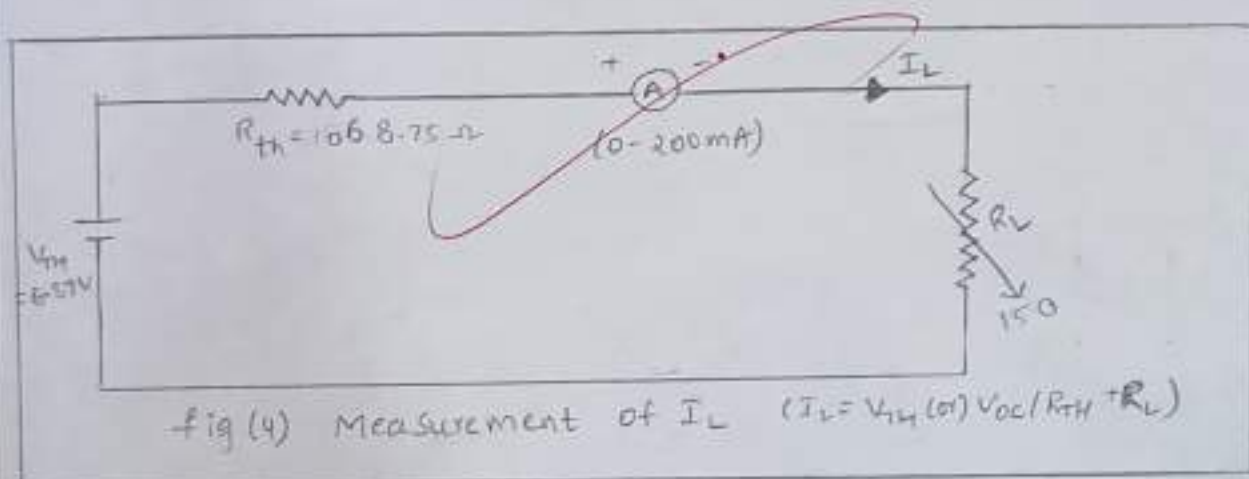
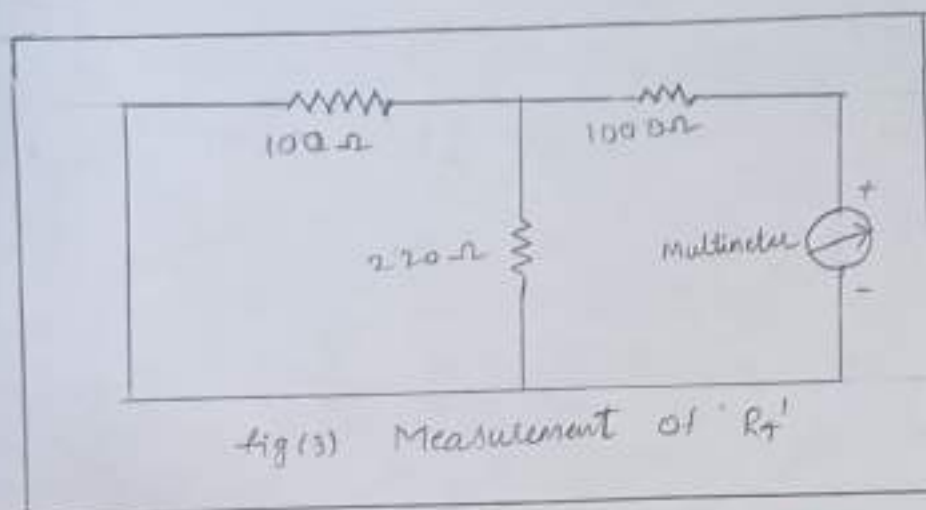


fig (2) Measurement of V_{TH} (or) V_{OC}



- Procedure :
- (1) Connect the circuit as shown in fig(1).
 - (2) Measure the current in R_L .
 - (3) Connect the circuit as shown in fig(2).
 - (4) Measure open circuit voltage (V_{oc}) by open circuiting terminals i.e V_{TH} .
 - (5) Draw the thevenin's theorem equivalent circuit as show in fig (3).
 - (6) Measurement current in R_L .

Tabular Column:

Parameters	Theoretical values	Practical values
V_{th}	6.875 V	7.06 V
R_{th}	1068.75 Ω	1055 Ω
I_L	5.63 mA	6.5 mA

Calculations:

$$R_{th} = \left(\frac{100 \times 220}{100 + 220} \right) + 1000 = 68.75 + 1000$$

$$R_{th} = 1068.75$$

$$\frac{V_{th} - 10}{100} + \frac{V_{th}}{220} = 0 \Rightarrow 22V_{th} - 220 + 10V_{th} = 0$$

$$V_{th} = 6.875 V$$

$$I_L = \frac{V_{th}}{R_{th} + R_L} = \frac{6.875}{1068.75 + 150}$$

$$= 5.63 \text{ mA}$$

Precautions: ① Check for proper connections before switching on the supply.

② Make sure of proper colour coding of resistors.

③ The terminal of the resistance should be properly connected.

Result : Hence, verification of thevenin's theorem is verified theoretically and practically.