IARE

INSTITUTE OF AERONAUTICAL ENGINEERING

(An Autonomous Institute affiliated to JNTUH, Hyderabad)

Dundigal, Hyderabad - 500 043

LABORATORY WORK SHEET

Name of the Student : Abdul Basith Khan

Class : 1st Year (CSM-A) Semester : I st

Roll Number									
2	3	9	5	1	A	6	6	0	1

Course Code : AEE001 Course Name : EEE Laboratory

Name of the Course Faculty : Dr. C Rajashekhar Goud Faculty ID : IARE11067

Exercise Number : Week Number : Date :

DAY TO DAY EVALUATION:

Marks	Aim / Preparation	Algorithm / Procedure / Performance in the Lab	Source Code / Calculations and Graphs	Program Execution / Results and Error Analysis	Viva - Voce	Total
Max. Marks	4	4	4	4	4	20
Obtained	4	4	4	3	4	19

Signature of Faculty

START WRITING FROM HERE : Super position Theorem :-

Aim :-

To verify principle of super-position theorem for an electrical circuit theoritically and practically.

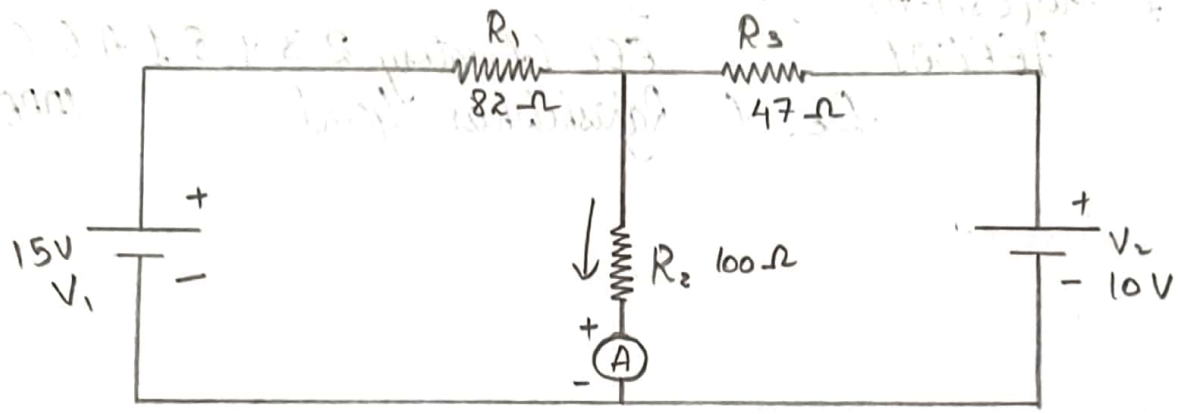
Apparatus :-

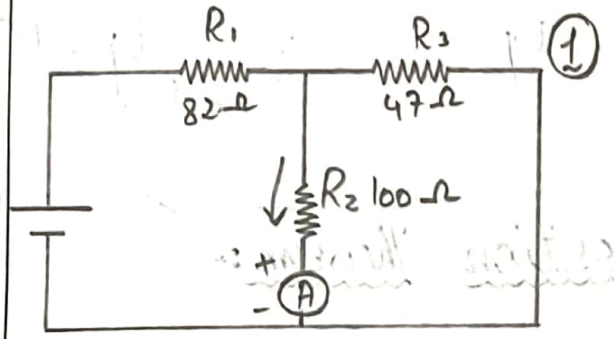
S.No	Equipment	Range	Type	Quantity
1.	Resistors	82Ω, 47Ω, 100Ω	Carbon	03
2.	Ammeter	(0-200mA)	Digital	01
3.	R.P.S	(0-30)	Digital	01
4.	Bread Board	-	-	01
5.	Connecting	-	-	As required

ROLL NUMBER :

Statement :-

In a linear, bilateral network the response in any element is equal to sum of individual responces while all sources are non-operative.





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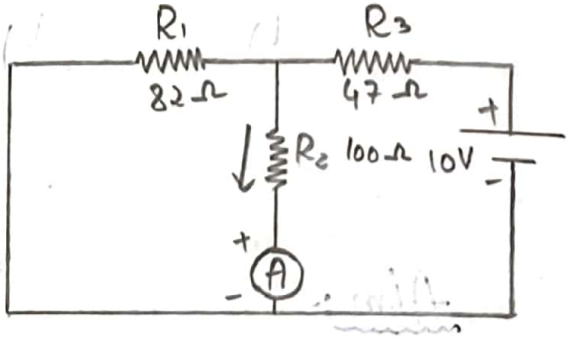

Observation :-

Parameters	When both V_1 and $V_2 \neq 0$ (I)	When $V_1 \neq 0$ and $V_2 = 0$ (Ω)	When $V_1 = 0$ and $V_2 \neq 0$ (Ω)
Current through R_3 (mA) (Theoritical Values)	0.088 A	0.040 A	0.048 A
Current through R_3 (mA) (Practical Values)	0.089 A	0.042 A	0.047

Procedure :-

1) Convert the circuit as shown in fig (1) and note down the current flowing through R_3 and let it be I.

2) Connect the circuit as shown in figure (2) and note down the ammeter reading and let it be I_1.

3) Connect the circuit as shown in figure (3) and note down the ammeter reading and let it be I_2.

4) Verify for $I = I_1 + I_2$

5) Compare the practical and Theoritical current.

Calculation :-

Case (i) :- $V_1 \neq 0$, $V_2 = 0$ $R_1 = 82\,\Omega$, $R_2 = 100\,\Omega$, $R_3 = 47\,\Omega$

$$R_{eq} = R_1 + R_2 // R_3 = R_1 + \frac{R_2 R_3}{R_2 + R_3} = 82 + \frac{100 \times 47}{100 + 47}$$

$$= 82 + \frac{4700}{147} = 82 + 31.9 = 113.9\,\Omega$$

$$I_T = \frac{V}{R_{eq}} = \frac{15}{113.9} = 0.13\,A$$

$$I_x = I_T \times \frac{R_3}{R_2 + R_3} = 0.13 \times \frac{47}{100 + 47} = 0.13 \times \frac{47}{147}$$

$$= 0.13 \times 0.31$$

$$\boxed{I_x = 0.040\,A}$$

Case (ii) :- $V_1 = 0$, $V_2 \neq 0$ $R_1 = 82\,\Omega$, $R_2 = 100\,\Omega$, $R_3 = 47\,\Omega$

$$R_{eq} = R_1 // R_2 + R_3 = \frac{R_1 R_2}{R_1 + R_2} + R_3 = \frac{82 \times 100}{82 + 100} + 47$$

$$= \frac{8200}{182} + 47 = 45.05 + 47 = 92.05\,\Omega$$

$$I_T = \frac{V}{R_{eq}} = \frac{10}{92} = 0.108\,A$$

$$I_y = I_T \times \frac{R_1}{R_1 + R_2} = 0.108 \times \frac{82}{182} = 0.108 \times 0.45 = 0.048\,A$$

$$\boxed{I_y = 0.048\,A}$$

Now current through $R_2 = I_x + I_y = 0.040 + 0.048$

$= 0.088$ A.

Precautions:-

* Check for proper connections before switching ON the supply.
* Make sure of proper colour of resistor.
* The terminal of the resistance should be properly connected.

Result:-

Hence Superposition Theorem is verified.