

Experiment No. 3
Date:

VERIFICATION OF SUPERPOSITION THEOREM

Aim: Verification of the Superposition Theorem.

Equipment Required:

1. Superposition & Reciprocity Theorems trainer kit.
2. Milliammeter – (0-200mA)
3. Voltmeter-(0-20V)
4. Connecting wires

Theory:

“In any bilateral linear network which contains more than one energy source, the current flowing through any element is the vectorial sum of currents that are caused to flow in the element due to individual energy sources at a time setting all other sources to zero.”

Procedure:

1. Connect the circuit as shown in the circuit diagram figure (1).
2. Set $V_1=15V$, for this connect fixed 15V supply.
3. Set $V_2=10V$, for this adjust the variable supply to 10V.
4. Note the current (I) through E & F, when both V_1 and V_2 are applied.
5. For the same circuit apply voltage V_1 and make sure that the V_2 to be shorted ($V_2 = 0$) and note down the current (I_1) through E & F.
6. For the same circuit apply voltage V_2 and make sure that the V_1 to be shorted ($V_1 = 0$) and note down the current (I_2) through E & F.
7. The Superposition Theorem is verified i.e. $I = I_1 + I_2$.
8. Repeat the above procedure for different variable supplies.

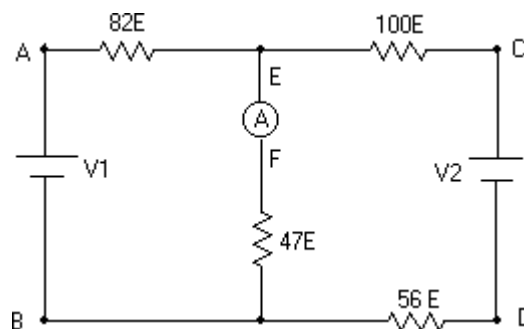


Figure 1

TABULAR COLUMNS

Theoretical Values

	Source		Ammeter Reading (I) mA
	1	2	
Both sources are acting	10 V	10 V	I =
Source 1 is acting	10 V	0 V	I' =
Source 2 is acting	0 V	10 V	I'' =

$$I = I' \square I'' =$$

Practical Values

	Source		Ammeter Reading (I) mA
	1	2	
Both sources are acting	10 V	10 V	I =
Source 1 is acting	10 V	0 V	I' =
Source 2 is acting	0 V	10 V	I'' =

$$I = I' \square I'' =$$

Model Calculations:

Precautions:

1. Voltage control knob should be kept at minimum position
2. current control knob of RPS should be kept at maximum position

Result:

Superposition theorem have been verified theoretically and practically.

VIVA QUESTIONS:

1. State Superposition theorem.
2. How to find power using Superposition theorem?
3. Write applications of super position theorem.
4. Is it possible to apply Superposition theorem to nonlinear circuit?
5. is it possible to apply Superposition theorem to ac as well as dc circuit?

Virtual lab link:

<http://vlabs.iitkgp.ernet.in/asnm/exp5/index.html>