

LAB NO: 09

TO ANALYZE A DC CIRCUIT USING SUPERPOSITION THEOREM

OBJECTIVE:

THEORY:

SUPERPOSITON THEOREM:

The superposition theorem for electrical circuits states that for a linear system the response (voltage or current) in any branch of a bilateral linear circuit having more than one independent source equals the algebraic sum of the responses caused by each independent source acting alone, where all the other independent sources are replaced by their internal impedances.

To ascertain the contribution of each individual source, all of the other sources first must be "turned off" (set to zero) by:

1. Replacing all other independent voltage sources with a short circuit (thereby eliminating difference of potential i.e. $V=0$; internal impedance of ideal voltage source is zero (short circuit)).
2. Replacing all other independent current sources with an open circuit (thereby eliminating current i.e. $I=0$; internal impedance of ideal current source is infinite (open circuit)).

APPARATUS:

- Digital multi-meter
- DC power supply
- Resistors
- Connecting wires

SCHEMATIC DIAGRAM:

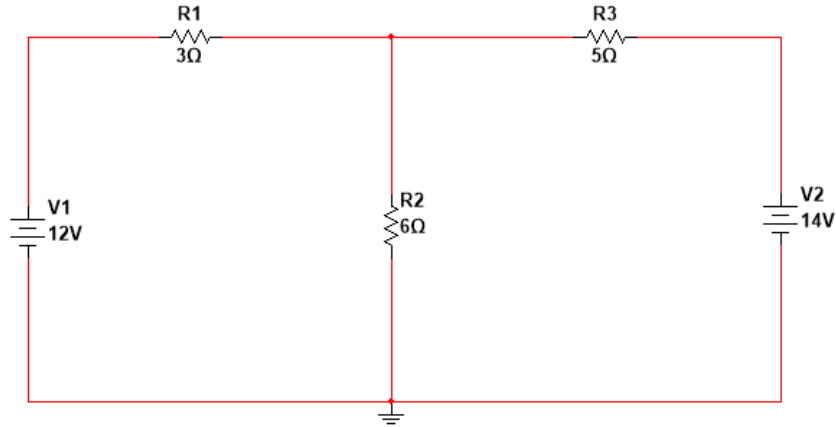


Figure 9.1: Circuit Diagram

PROCEDURE:

CALCULATIONS:

Source	I_{R2} (Theoretical)	I_{R2} (Practical)
V_1 only		
V_2 only		
V_1 and V_2		

Table 9.1

CONCLUSION:

POST LAB QUESTIONS:

1. In superposition theorem, when we consider the effect of one current source, what should be done to all other current sources?

2. In superposition theorem, when we consider the effect of one current source, what should be done to all other voltage sources?

3. In superposition theorem, when we consider the effect of one voltage source, what should be done to all other voltage sources?

Teacher Remarks:

Obtained Marks: _____ / 10