AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH

Faculty of Science and Technology

Assignment Cover Page

Assignment Title:	Observation of Superposition Theorem in DC circuit.		
Assignment No:	10	Date of Submission:	29 November 2021
Course Title:	Introduction To Electrical Circuits		
Course Code:	Click here to enter text.	Section:	L
Semester:	Fall 2021-22	Course Teacher:	Click here to enter text.

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Title: Observation of Superposition Theorem in DC circuit.

Objectives: -

The main objectives of this experiment are to

- Analyze the superposition theorem's use to multiple DC source circuits in terms of voltage and current measurements.
- Can Calculate the power direction.

Equipment:

- Trainer board
- Digital multimeter
- DC source: 15v, 20v
- Resistors: 6k, 8k, 7k, 25k, 35k
- Connecting wire

Procedure: -

1. At we used superposition theorem to solve this circuit.
2. Then we used multisim to complete the circuit.
3. After that we used multimeter to measure the current and voltage or a particular resistor.
4. Using necessary formulas, we solved the circuit.
5. we match multimeter result and theoretical result.
6. There is little bit derivation occur in your calculation. we put it into the table.
7. after that we calculate the power by using current and voltage.

Data: -

Source	I_{R2} Theory	I_{R2} Experimental	Deviation
E1 only	342uA	343.725uA	1.725 Deviation
E2 only	-333uA	-333.067 uA	0.067 Deviation
E1 & E2	10uA	8.882uA	1.11 Deviation

Table:1

Simulation and Measurement: -

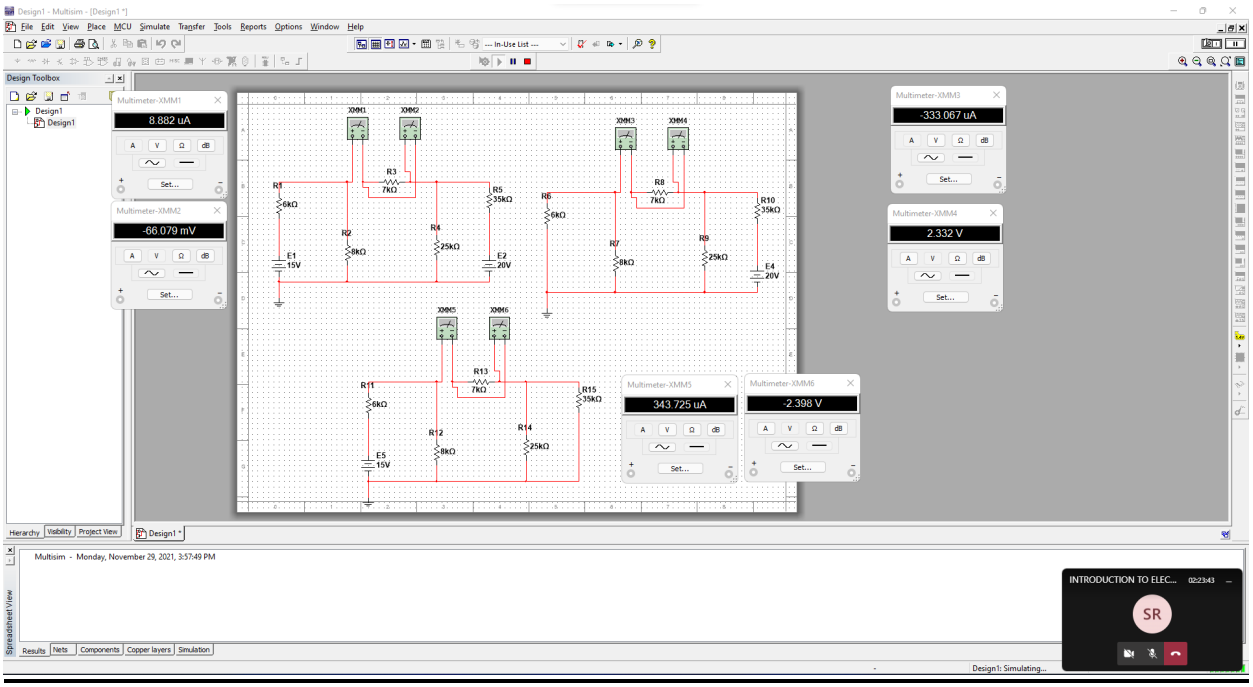

Figure:1

Calculation and Result Analysis: -

when E_2 active.

$$I_2 = \frac{E_2}{R_2} = -\frac{20}{35} = -0.57 \text{ mA}$$

$\therefore R = 25.013 \text{ k}\Omega$ [because the circuit remain same

$$\therefore I''_{R_3} = \frac{-0.57 \times (R_5 \| R_4)}{25.013}$$

$$= -0.332 \text{ mA}$$

$$= -332 \text{ } \mu\text{A}$$

when E_1 and E_2 active.

$$I_{R_3} = (342 - 332) \text{ } \mu\text{A}$$

$$= 10 \text{ } \mu\text{A}.$$

wher E_1 active,

$$I_1 = \frac{E}{R_1} = \frac{15}{6} = 2.5 \text{ mA}$$

$$\therefore R_4 \,||\, R_5 = 25\,k\Omega \,||\, 35\,k\Omega$$

$$= 14.583\,k\Omega$$

$$R_1 \,||\, R_2 = 6\,k\Omega \,||\, 8k\Omega$$

$$= 3.43\,k\Omega$$

$$\therefore R = (R_4 \,||\, R_5) + (R_1 \,||\, R_2) + R_3$$

$$= (14.583 + 3.43 + 7)\,k\Omega$$

$$= 25.013\,k\Omega$$

$$\therefore I_{R_3}' = \frac{2.5 \times \text{~~R+H~~} 3.428}{25.013}$$

$$= 0.342\,mA = 342\,\mu A$$

Discussion: -

The data/findings of the experiment were verified and observed that the experiment was successful. The strategy of the study was improved, investigated, and described by calculating the circuit of super position theorem.