Verification of Superposition Theorem

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Verification of Superposition Theorem

Procedure:

Set all the resistances R_1, R_2 and R_3 and choose any arbitrary values of V_1 and V_2.

Experiment Part Select:

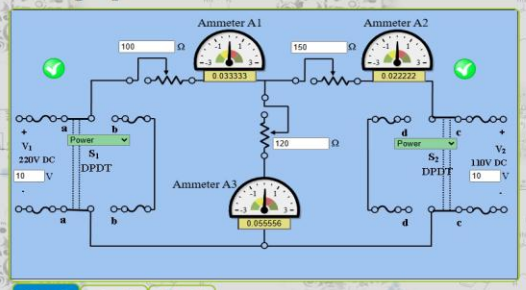
Case 1: In presence of both the sources
Select switch of S_1 and S_2 to power and Simulate the program. Observe the result from case 1 tab.

Case-2: In presence of V_1 only
Apply switch S_1 to power and S_2 to short. Simulate the program. Read ammeter values from Case 2 tab.

Case-3: In presence of V_2 only
Apply switch S_1 to short and S_2 to power. Simulate the program. Read ammeter values from Case 3 tab. Click on 'Fill data to the table' to update the observation table.

Repeat the above steps to take other observations.

MC-Moving Coil.
DPDT- Double pole Double throw.
N.B.:- All the resistances are in ohms.



Case 1 | Case 2 | Case 3

Determination of branch currents in presence of both the sources:

Select both the switches, S_1 and S_2 to power.

And then click on Simulate.

Simulate

A1 ammeter reading (in Amp)	A2 ammeter reading (in Amp)	A3 ammeter reading (in Amp)
0.033333	0.022222	0.055556

Observation Table:

Serial no. of Observation	In presence of both V_1 and V_2			In presence of V_1 only			In presence of V_2 only		
	Brach current I_1 (in amps)	Brach current I_2 (in amps)	Brach current I_3 (in amps)	Brach current I_1 (in amps)	Brach current I_2 (in amps)	Brach current I_3 (in amps)	Brach current I_1 (in amps)	Brach current I_2 (in amps)	Brach current I_3 (in amps)
1st									
2nd									

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Experiment Part Select:

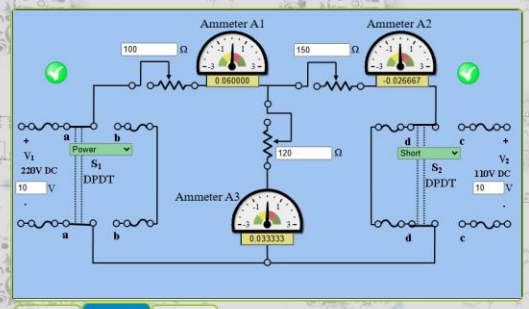
Case 1: In presence of both the sources
Select switch of S_1 and S_2 to power and Simulate the program. Observe the result from case 1 tab.

Case-2: In presence of V_1 only
Apply switch S_1 to power and S_2 to short. Simulate the program. Read ammeter values from Case 2 tab.

Case-3: In presence of V_2 only
Apply switch S_1 to short and S_2 to power. Simulate the program. Read ammeter values from Case 3 tab. Click on 'Fill data to the table' to update the observation table.

Repeat the above steps to take other observations.

MC-Moving Coil.
DPDT- Double pole Double throw.
N.B.:- All the resistances are in ohms.



Case 1 | Case 2 | Case 3

Determination of branch currents in presence of V_1 source only:

Select the switch S_1 to power and S_2 to short.

And then click on Simulate.

Simulate

A1 ammeter reading (in Amp)	A2 ammeter reading (in Amp)	A3 ammeter reading (in Amp)
0.060000	-0.026667	0.033333

Observation Table:

Serial no. of Observation	In presence of both V_1 and V_2			In presence of V_1 only			In presence of V_2 only		
	Brach current I_1 (in amps)	Brach current I_2 (in amps)	Brach current I_3 (in amps)	Brach current I_1 (in amps)	Brach current I_2 (in amps)	Brach current I_3 (in amps)	Brach current I_1 (in amps)	Brach current I_2 (in amps)	Brach current I_3 (in amps)
1st									
2nd									

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Verification of Superposition Theorem

Procedure:

Set all the resistances R_1, R_2 and R_3 and choose any arbitrary values of V_1 and V_2.

Experiment Part Select:

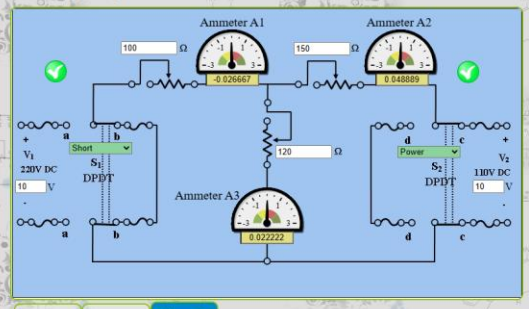
Case 1: In presence of both the sources
Select switch of S_1 and S_2 to power and Simulate the program. Observe the result from case 1 tab.

Case-2: In presence of V_1 only
Apply switch S_1 to power and S_2 to short. Simulate the program. Read ammeter values from Case 2 tab.

Case-3: In presence of V_2 only
Apply switch S_1 to short and S_2 to power. Simulate the program. Read ammeter values from Case 3 tab. Click on 'Fill data to the table' to update the observation table.

Repeat the above steps to take other observations.

MC-Moving Coil.
DPDT- Double pole Double throw.
N.B.:- All the resistances are in ohms.



Case 1 | Case 2 | Case 3

Determination of branch currents in presence of V_2 source only:

Select the switch S_1 to short and S_2 to power.

And then click on Simulate.

Simulate

A1 ammeter reading (in Amp)	A2 ammeter reading (in Amp)	A3 ammeter reading (in Amp)
-0.026667	0.048889	0.022222

Fill data to the table

Observation Table:

Serial no. of Observation	In presence of both V_1 and V_2			In presence of V_1 only			In presence of V_2 only		
	Brach current I_1 (in amps)	Brach current I_2 (in amps)	Brach current I_3 (in amps)	Brach current I_1 (in amps)	Brach current I_2 (in amps)	Brach current I_3 (in amps)	Brach current I_1 (in amps)	Brach current I_2 (in amps)	Brach current I_3 (in amps)
1st	0.033333	0.022222	0.055556	0.060000	-0.026667	0.033333	-0.026667	0.048889	0.022222
2nd									

Verification of Thevenin's Theorem

Procedure:

Keep all the resistances (R_1, R_2, R_3, R_L) close to their respective maximum values. Choose any arbitrary values of V_1 and V_2.

Experiment Part Select:

Case 1:
Select switch of S_1 to Power and S_2 to load. Simulate the program. Observe the result from Table 1.

Case-2:
a)Thevenin Voltage analysis:
Apply switch S_1 to power and S_2 to intermediate. Simulate the program.Read Thevenin voltage (V_{th}) from Case 2 tab.

b)Thevenin Resistance analysis:
Apply switch S_1 to short and S_2 to power. Simulate the program. Read Thevenin resistance (R_{th}) from Case 2 tab.

Case-3: Using V_{th} and R_{th} determine Load Current:
Specify the load resistance in case of the result table as the same load resistance entered in the main circuit. Simulate the program. Read Load current (I_L) from Case 3 tab. Compare the load currents (I_L) obtained from above two cases.

MC-Moving Coil.
DPDT- Double pole Double throw.
N.B. - All the resistances are in ohms.

Case 1 | Case 2(a) | Case 2(b) | Case 3

Circuit analysis to determine **Load Current (I_L)**

To get the load current select switches S_1 to Power and S_2 to Load.

And then click on Simulate.

Load current (I_L): 0.011765

Simulate

Observation Table:

Serial no. of Observation	Load Current(I_L) from case 1	Load Voltage(V_L)	Load Resistance (R_L)=V_L/I_L	Thevenin Voltage(V_{th}) from case 2(a)	2nd Voltage source(v) for case 2(b)	Ammeter Reading(I) from case 2(b)	Thevenin Resistance R_{th}=V/I	Load current (I_L)=V_{th}/(R_{th}+R_L)

Verification of Thevenin Theorem

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Verification of Thevenin's Theorem

Procedure:

Keep all the resistances (R_1, R_2, R_3, R_L) close to their respective maximum values. Choose any arbitrary values of V_1 and V_2.

Experiment Part Select:

Case 1:
Select switch of S_1 to Power and S_2 to load. Simulate the program. Observe the result from Table 1.

Case-2:
a)Thevenin Voltage analysis:
Apply switch S_1 to power and S_2 to intermediate. Simulate the program.Read Thevenin voltage (V_{th}) from Case 2 tab.

b)Thevenin Resistance analysis:
Apply switch S_1 to short and S_2 to power. Simulate the program. Read Thevenin resistance (R_{th}) from Case 2 tab.

Case-3: Using V_{th} and R_{th} determine Load Current:
Specify the load resistance in case of the result table as the same load resistance entered in the main circuit. Simulate the program. Read Load current (I_L) from Case 3 tab. Compare the load currents (I_L) obtained from above two cases.

MC-Moving Coil.
DPDT- Double pole Double throw.
N.B. - All the resistances are in ohms.

Case 1 | Case 2(a) | Case 2(b) | Case 3

Circuit analysis to determine **Thevenin Resistance (R_{th})**

To get the Thevenin Resistance select switches S_1 to Short and S_2 to Power. And then click on Simulate.

Voltage V_2 : 10.000 and Current : 0.03846

Thevenin Resistance (R_{th}): 260.00

Simulate

Observation Table:

Serial no. of Observation	Load Current(I_L) from case 1	Load Voltage(V_L)	Load Resistance (R_L)=V_L/I_L	Thevenin Voltage(V_{th}) from case 2(a)	2nd Voltage source(v) for case 2(b)	Ammeter Reading(I) from case 2(b)	Thevenin Resistance R_{th}=V/I	Load current (I_L)=V_{th}/(R_{th}+R_L)

Verification of Thevenin Theorem

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Verification of Thevenin's Theorem

Procedure:

Keep all the resistances (R_1, R_2, R_3, R_L) close to their respective maximum values. Choose any arbitrary values of V_1 and V_2.

Experiment Part Select:

Case 1:
Select switch of S_1 to Power and S_2 to load. Simulate the program. Observe the result from Table 1.

Case-2:
a)Thevenin Voltage analysis:
Apply switch S_1 to power and S_2 to intermediate. Simulate the program.Read Thevenin voltage (V_{th}) from Case 2 tab.

b)Thevenin Resistance analysis:
Apply switch S_1 to short and S_2 to power. Simulate the program. Read Thevenin resistance (R_{th}) from Case 2 tab.

Case-3: Using V_{th} and R_{th} determine Load Current:
Specify the load resistance in case of the result table as the same load resistance entered in the main circuit. Simulate the program. Read Load current (I_L) from Case 3 tab. Compare the load currents (I_L) obtained from above two cases.

MC-Moving Coil.
DPDT- Double pole Double throw.
N.B. - All the resistances are in ohms.

Case 1 | Case 2(a) | Case 2(b) | Case 3

Circuit analysis to determine **Thevenin Voltage (V_{th})**

To get the Thevenin voltage select switches S_1 to Power and S_2 to Intermediate.

And then click on Simulate.

Thevenin Voltage (V_{th}): 6.0000

Simulate

Observation Table:

Serial no. of Observation	Load Current(I_L) from case 1	Load Voltage(V_L)	Load Resistance (R_L)=V_L/I_L	Thevenin Voltage(V_{th}) from case 2(a)	2nd Voltage source(v) for case 2(b)	Ammeter Reading(I) from case 2(b)	Thevenin Resistance R_{th}=V/I	Load current (I_L)=V_{th}/(R_{th}+R_L)

Verification of Thevenin's Theorem

Procedure:

Keep all the resistances (R_1, R_2, R_3, R_L) close to their respective maximum values. Choose any arbitrary values of V_1 and V_2.

Experiment Part Select:

Case 1:
Select switch of S_1 to Power and S_2 to load. Simulate the program. Observe the result from Table 1.

Case-2:
a)Thevenin Voltage analysis:
Apply switch S_1 to power and S_2 to intermediate. Simulate the program.Read Thevenin voltage (V_{th}) from Case 2 tab.

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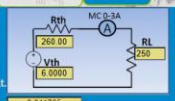
Apply switch S_1 to short and S_2 to power. Simulate the program. Read Thevenin resistance (R_{th}) from Case 2 tab.

Case-3: Using V_{th} and R_{th} determine Load Current:
Specify the load resistance in case of the result table as the same load resistance entered in the main circuit. Simulate the program. Read Load current (I_L) from Case 3 tab. Compare the load currents (I_L) obtained from above two cases.

MC-Moving Coil.
DPDT- Double pole Double throw.
N.B.:- All the resistances are in ohms.

Case 1 | Case 2(a) | Case 2(b) | Case 3

Click on simulate to get the Load Current(I_L) from the Thevenin equivalent parameter of the above circuit.



Simulate

Load Current(I_L) : 0.011765

Fill data to the table

Observation Table:

Serial no. of Observation	Load Current(I_L) from case 1	Load Voltage(V_L)	Load Resistance (R_L)=V_L/I_L	Thevenin Voltage(V_{th}) from case 2(a)	2nd Voltage source(v) for case 2(b)	Ammeter Reading(I) from case 2(b)	Thevenin Resistance R_{th}=V/I	Load current (I_L)=V_{th}/(R_{th}+R_L)