CMPE226 Electronics Lab Report

Experiment # 2

Superposition Theorem

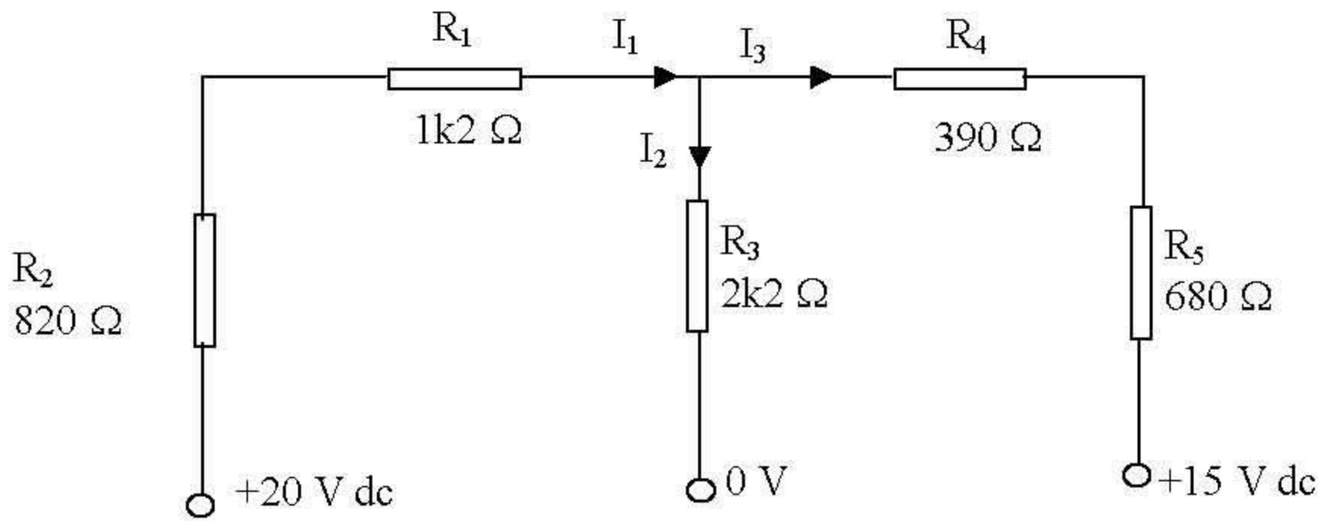
	Std. No	Name	Group
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

Date _____

Aim of the Experiment: *To investigate the effects of more than one voltage source in a network.*

Step1 :Connect up the following circuit as below

Fig.1



- Previous experiments have shown what currents and voltages are present in a resistive network with one voltage source. We know wish to investigate networks which have more than one source, and to formulate some expressions for the resultant currents.
- This is a similar network to the one used to investigate Kirchhoff's Laws, except that two voltage sources are used.

Step2: Monitor the variable d.c. voltage. Switch on the psu and set the variable d.c voltage to 20 V.

Step3: Measure the current in each branch of the network. This will give the current in R_1 and R_2, R_3, R_4 and R_5 respectively.

Step4: Note both the magnitude and the polarity of each current, and tabulate them.

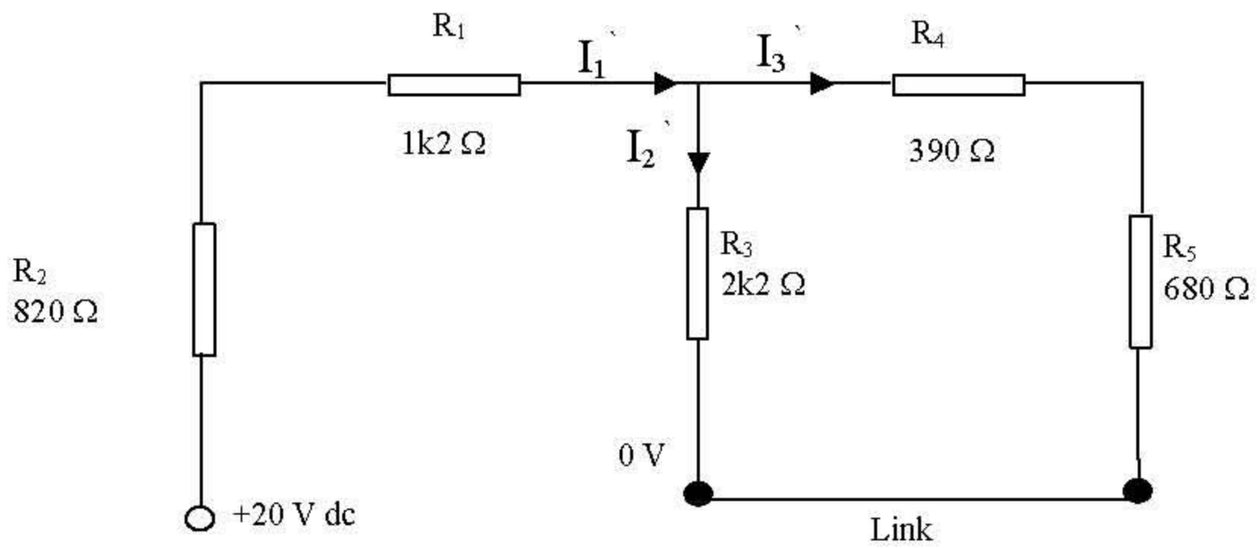
Component Branch	Polarity of the current	Current (mA)
R1and R2		
R3		
R4 and R5		

Q1) Do the current directions agree with those shown in Figure 1?

- If the answer to Question 1 is No, Do not alter the directions of the arrows, but mark the current as negative

Step5: Now disconnect the 15 V source and link the resistors R3 and R5, as shown below

Fig.2



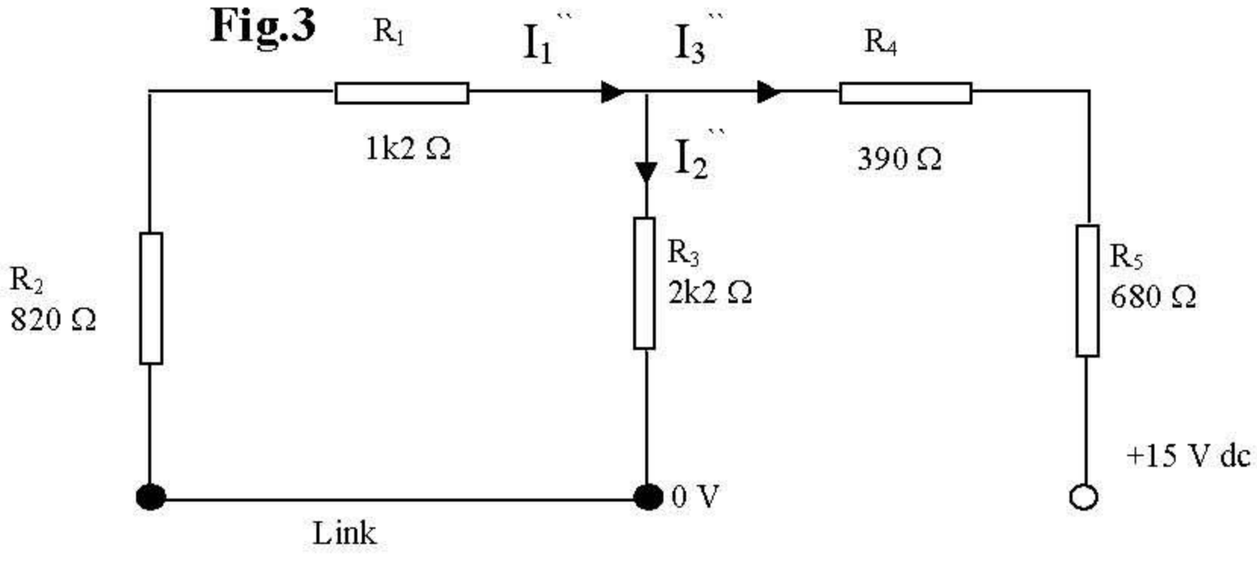
Step6 : Measure and tabulate the magnitude and the polarity of the currents I_1`, $I_2$` and I_3`

Component Branch	Polarity of the current	Current (mA)
R1and R2		
R3		
R4 and R5		

Q2) Again do the directions of the currents agree with those shown on the diagram?

Step7: Remove the link between R_3 and R_5 and replace the +15V source connections as they are initially. Disconnect the 20V source, and link R_2 and R_3 like the circuit is shown below and fill following table for the currents $I_1^{``}$ , $I_2^{``}$ and $I_3^{``}$.

Fig.3



Component Branch	Polarity of the current	Current (mA)
R1and R2		
R3		
R4 and R5		

Q3) Can you notice any relationship between I_1, I_1`and I_1`` ?

Q4) Does the same relationship hold for I_2 with $I_2^{`}$ and $I_2^{``}$, also $I_3$ with $I_3^{`}$ and $I_3^{``}$?

Q5) Calculate currents I_1 I_2 and I_3 (Consider Figure 1) Mesh-Current Analysis and compare your this theoretical solution with experimental one which you have found in Step 4. (*Use back of the page if space is not enough*)

Conclusions