HACETTEPE UNIVERSITY
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
ELE 112 INTRODUCTION TO ELECTRICAL ENGINEERING LABORATORY

EXPERIMENT #4

EXPERIMENTAL EVALUATION OF SOURCE TRANSFORMATIONS, VOLTAGE AND CURRENT DIVIDER CIRCUITS AND THE SUPERPOSITION PRINCIPLE IN DC CIRCUITS

Objective: Source transformations, voltage and current divider circuits and superposition.

Theory: The details are given in the ELE110 Introduction to Electrical Engineering course notes.

2. EXPERIMENTAL WORK

2.1 Set up the circuit shown in *Fig. 1.* Connect a voltmeter between a and b, and measure the voltage V_{ab}. Also measure the equivalent resistance between a and b (R_{ab}).

2.2 Set up the circuit in *Fig. 2*, and measure the voltage V_{ab} and the current I_{ab} for V_{in} = 2V, 4V, 6V, 8V and 10V, respectively.

2.3 Set up the circuit in *Fig. 3*, and measure the current I_{in}, I_1, and I_2 for V_{in} = 0.66V, 1.32V, 1.98V, 3.3V, and 3.64V, respectively.

2.4 Set up the circuit in *Fig. 4.*
a) Connect current source only, and measure V_{ab}.
b) Connect voltage source only, and measure V_{ab}.
c) Connect both of the sources at the same time, and measure V_{ab}.

3. RESULTS AND CONCLUSION

3.1 Compare your results from the preliminary work with the measurement you obtained in step 2.1.
3.2 By using the measurements in step 2.2, sketch V_{ab} vs. V_{in}. Compare this plot to the one in your preliminary work and comment.
3.3 By using the measurements in step 2.3., Sketch I_{in} vs I_1 and I_{in} vs I_2. Compare these plots to the one in your preliminary work and comment.
3.4 By using the measured values in step 2.4, prove the superposition principle.

EQUIPMENTS AND COMPONENTS

DC power supply
10 mA. current source
AVO meter
Resistors: 100Ω (#1), 120Ω (#1), 220Ω (#2), 330Ω (#1)