

EASTERN MEDITERRANEAN UNIVERSITY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC  
ENGINEERING

EENG223

CIRCUIT THEORY I

EXPERIMENT 2

NETWORKS

Student Name & Student Number

1.....

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**Object:** To investigate what happens when resistors are interconnected in a circuit.

Construct the circuit in Fig. 2.1.

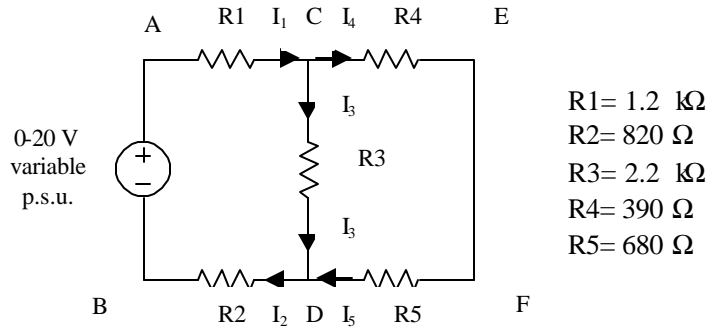


Fig. 2.1.

- Set power supply to 20 V.
- Measure the voltages across each resistor. Then measure the current at each branch by taking care of the directions and tabulate the results in Table 2.1. Calculate actual value of R by using Ohm's law ( $V=IR$ ).

**Table 2.1**

Component	Voltage (V)	Current (mA)	Calculate actual value of R
R1			
R2			
R3			
R4			
R5			

- Kirchoff's current law (KCL): The algebraic sum of all currents at any junction is zero.  
 $\sum I = 0.$
- Kirchoff's voltage law (KVL): In a closed circuit, the algebraic sum of all the voltages around the circuit is zero.  
 $\sum V = 0.$
- Ohm's law:  $V=IR$ .

**Questions:**

1. With reference to Fig. 2.1, can you notice any relationship between the voltages round the loop ABCD ? (Remember the polarities)
2. Does the sum of the voltages around loop CEFD give the same relationship ?

3. What about the loop ACEFDB ?
4. Are the directions of the currents shown in Fig. 2.1 correct ?
5. What can you say about the currents  $I_1$ ,  $I_3$  and  $I_4$  at node C ? ('node' means junction)
6. Does the same apply for currents  $I_2$ ,  $I_3$  and  $I_5$  at node D ?
7. What is the algebraic sum of the voltages round a loop in a circuit ?
8. What is the algebraic sum of the currents at a node in a circuit ?
9. How do your measured values correspond with the theoretical values ?
10. By what percentage do the actual values differ from the marked values ?
  
11. Do you think that these differences could account for the variation between measured and calculated values of current and voltage ?