ELECTROTECHNICH LAB.

PART 1 EXPERIMENTS

Yrd. Doç. Dr. Taha İMECİ

Arş. Gör. Ezgi YAMAÇ

Arş. Gör. Ufuk ŞANVER

İSTANBUL COMMERCE UNIVERSITY

Contents

EXPERIMENT: 1.1
COLOUR CODES OF RESISTORS

EXPERIMENTAL PROCEDURE:

Plug the Y-0016/001 module to the relevant place. Take a digital avometer and adjust it to measure resistance.

1- R1 resistance is four bands and its reading is shown in module. Read the R3-R4-R5-R6 resistances in the same way and write it to figure 1.15

RESISTANCE CODE	DISPLAYED VALUE	THE VALUE ON THE MULTIMETER
R3		
R4		
R5		
R6		

Figure 1.15

2- Measure every resistance with ohmmeter. Write the measured values to figure 1.15 Calculate if these values are in the tolerance limits?

Note: This value is not written in figure 1.15. Calculate and compare according to the chapter 1.

3- R2 resistance is five bands and its reading is shown in module. Read the R7-R8-R9-R10 resistances in the same way and write it to figure 1.16

RESISTANCE CODE	DISPLAYED VALUE	THE VALUE ON THE MULTIMETER
R7		
R8		
R9		
R10		

Figure 1.16

4- Measure every resistance with ohmmeter. Write the measured values to figure 1.16 Calculate if these values are in the tolerance limits?

Not: This value is also not written in figure 1.16. Calculate and compare according to the chapter 1.

EXPERIMENT: 3.1
EXAMINATION OF OHM'S LAW

EXPERIMENTAL PROCEDURE:

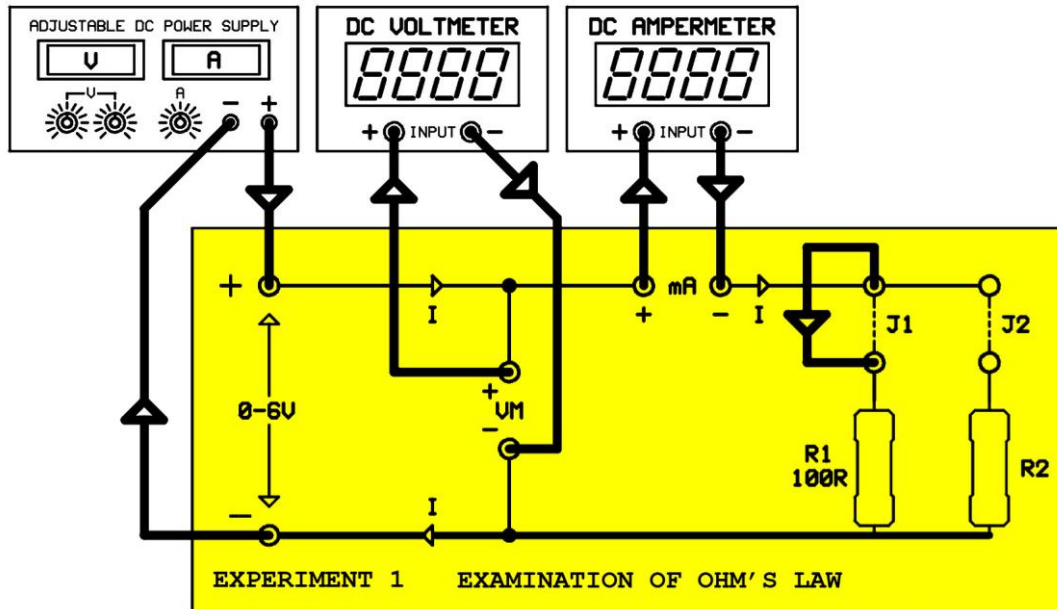Plug the Y-0016/002 module. Make the circuit connections as in figure3.3

Figure 3.3

Adjust the power supply's voltage potentiometers to minimum (**to left**), and the current potentiometers to maximum (**to right**). Apply the power to the circuit.

1- Adjust the power to the values in figure 3.4 and write the current values at every stage respectively.

NUMBER	E (VOLT)	I (mA)	V / A
1	1.0	10	100
2	2.0		
3	3.0		
4	4.0		
5	5.0		
6	6.0		

Figure 3.4

2- Calculate the V/A ratio at every step and write them to the table at figure 3.4 What is this value (**100**) which is the same at every stage?

3- Cut the power of circuit and open the J1 short circuit. This time short circuit J2. Calculate the mathematical value of R2 resistance.

NOTE=This experiment can be repeated with various voltage levels below 6,0Volt.

EXPERIMENT: 4.1
EXAMINATION OF KIRCHHOFF'S VOLTAGE LAW

EXPERIMENTAL PROCEDURE:

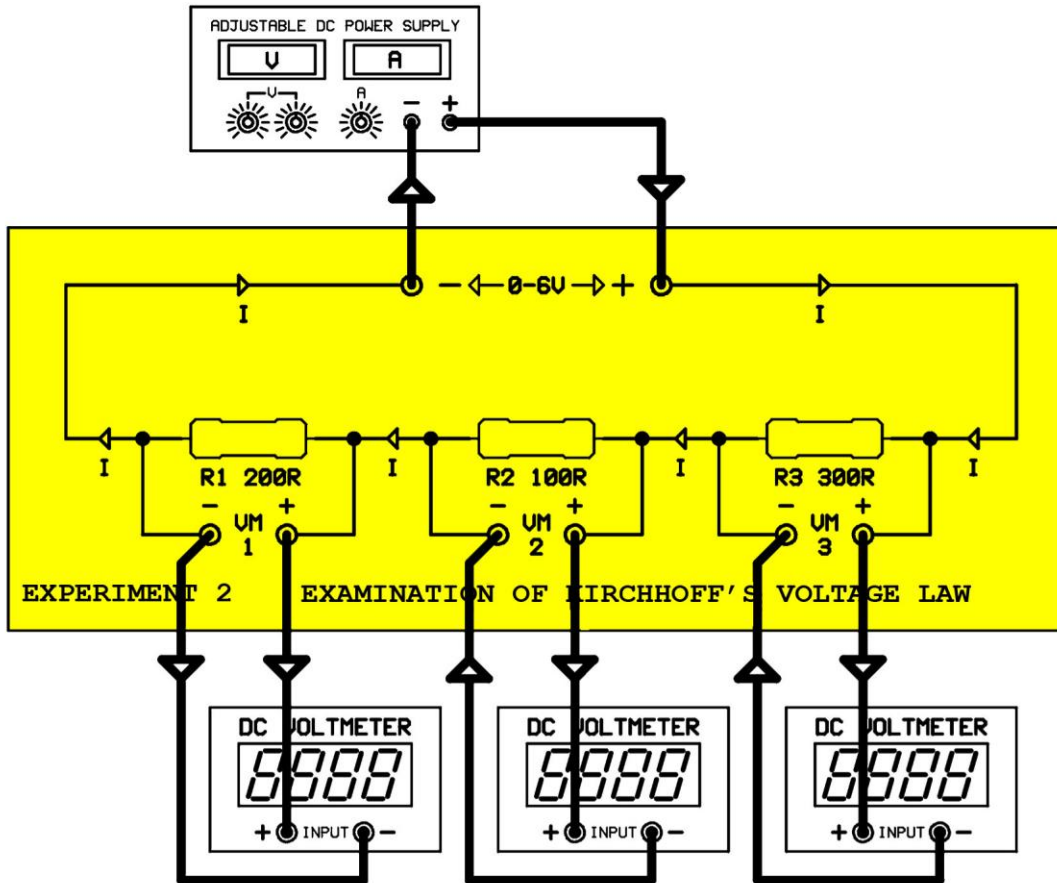Plug the Y-0016/002 module make the circuit connections as in figure 4.2

Figure 4.2

Adjust the power supply's voltage potentiometers to minimum (**to left**), and the current potentiometers to maximum (**to right**). Apply the power to the circuit.

1- Adjust the power to the values in figure 4.3 and write the voltage values at every stage respectively.

NUMBER	E (VOLT)	E1 (VOLT)	E2 (VOLT)	E3 (VOLT)
1	3			
2	6			

Figure 4.3

2- Does the Kirchhoff' voltage law equation is maintained at every stage? Calculate.

3- Calculate the total resistance of circuit.

4- Unplug the adjustable power supply from the circuit. Measure the total resistance (**between the sockets**) with the help of an ohmmeter. Compare it with the value you previously calculated.

NOTE= The result may be approximate. The reason for this is the tolerances of resistors.

EXPERIMENT: 4.2
EXAMINATION OF KIRCHHOFF'S CURRENT LAW

EXPERIMENTAL PROCEDURE:

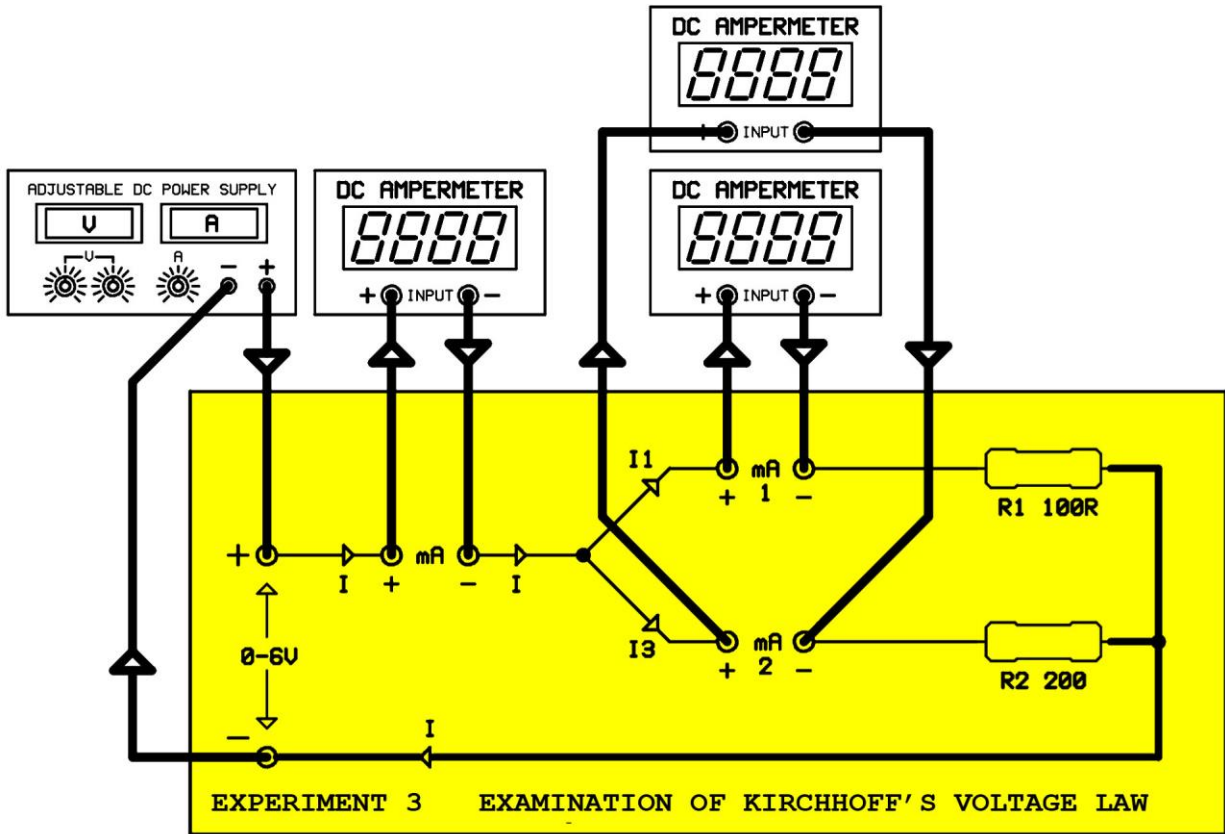Plug the Y-0016/002 module make the circuit connections as in figure 4.5

Figure 4.5

Adjust the power supply's voltage potentiometers to minimum (**to left**), and the current potentiometers to maximum (**to right**). Apply the power to the circuit.

1- Adjust the power to the values in figure 4.6 and write the current values at every stage respectively.

NUMBER	E (VOLT)	I1 (mA)	I2 (mA)	I (mA)
1	2			
2	4			
3	6			

Figure 4.6

2- Is the total current flowing into node (**I**) equal to the total current flowing out of the node (**I1-I2**)? Calculate for every step.

3- Calculate the total resistance (**R**) of circuit.

4- Calculate the circuit current from Ohm's Law for every step. Compare the results with the results of Kirchhoff's current law.

EXPERIMENT: 4.3
EXAMINATION OF SERIAL CONNECTED RESISTORS

EXPERIMENTAL PROCEDURE:

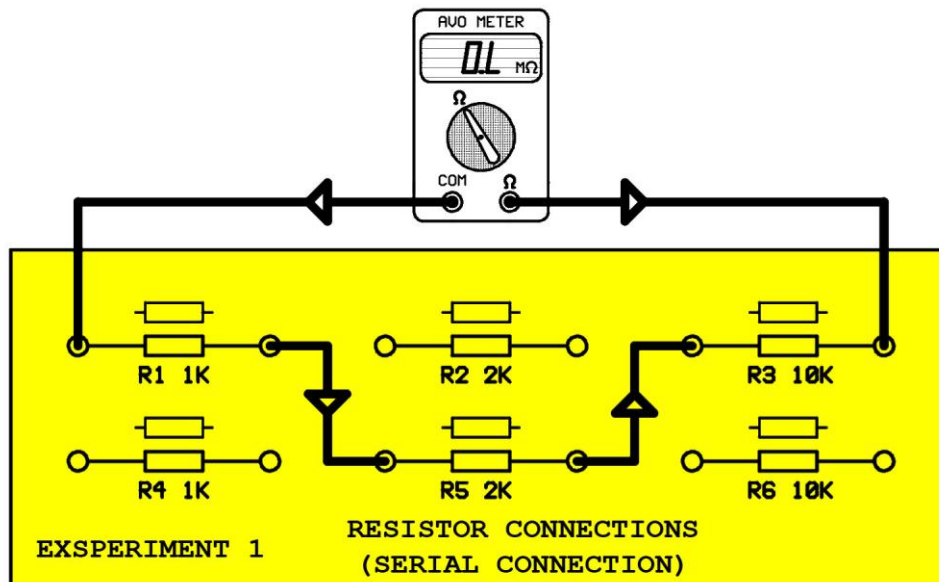Plug the Y-0016/003 module. Make the circuit connections like in figure 4.9

Figure 4.9

1- Write the value of resistance displayed by Ohmmeter.

2- R1=1K, R5=2K and R3=10K. So calculate the total resistance (**R**).

3- Compare the value you calculated and the value displayed by Ohmmeter. Why is there a difference?

NOTE: You can do new experiments by making different serial connections with the six resistors in the module.

EXPERIMENT: 4.4
EXAMINATION OF PARALLEL CONNECTED RESISTORS

EXPERIMENTAL PROCEDURE:

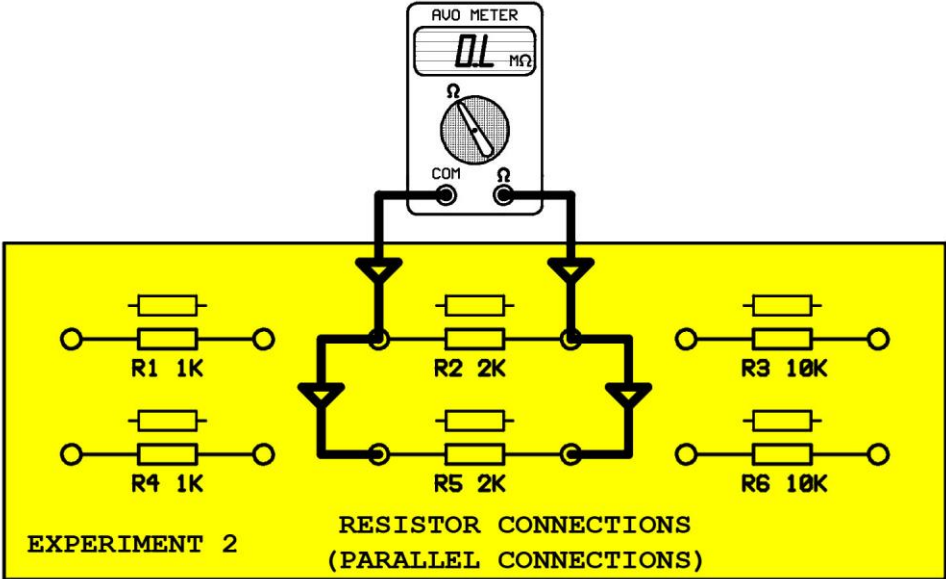Plug the Y-0016/003 module. Make the circuit connections as in figure 4.12

Figure 4.12

1- Write the resistance value displayed by the Ohmmeter.

2- R2=2K and R5=2K, calculate the total resistance (**R**).

3- Compare the value you calculated and the value Ohmmeter displayed. Why is there a difference?

NOTE: You can do new experiments by making different parallel connections with the six resistors in the module.

EXPERIMENT: 4.5
EXAMINATION OF MIXED CONNECTED RESISTORS

EXPERIMENTAL PROCEDURE:

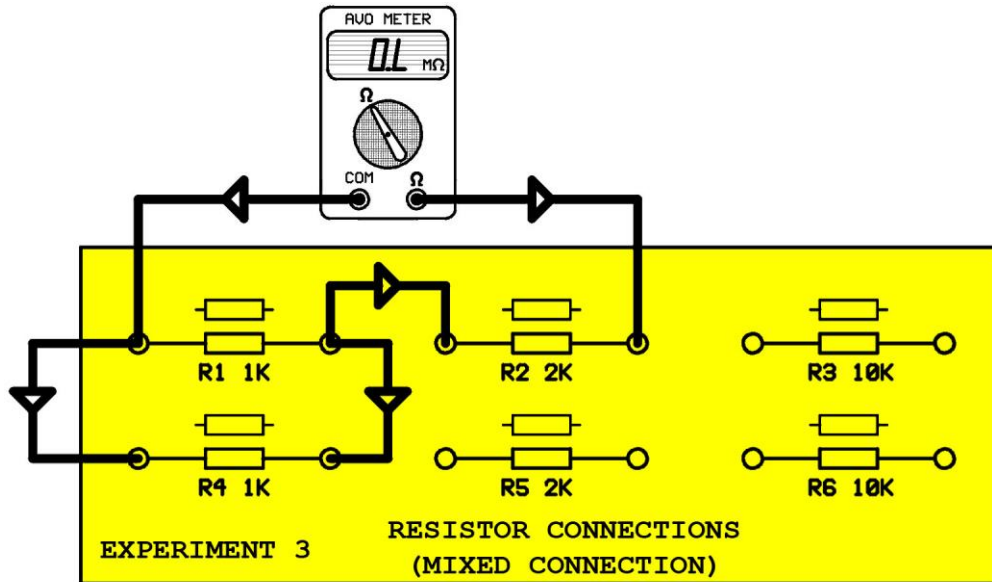Plug the Y-0016/003 module. Make the circuit connections as in figure 4.16

Figure 4.16

1- Write the resistance value displayed by Ohmmeter.

2- R1=1K, R4=1K and R2=2K. Calculate the total resistance of circuit.

3- Compare the value you calculated and the value Ohmmeter displayed. Why is there a difference?

NOTE: You can do new experiments by making different mixed connections with the six resistors in the module.