CMPE 226 Electronics Lab Report

Experiment # 3

Thevenin's Theorem

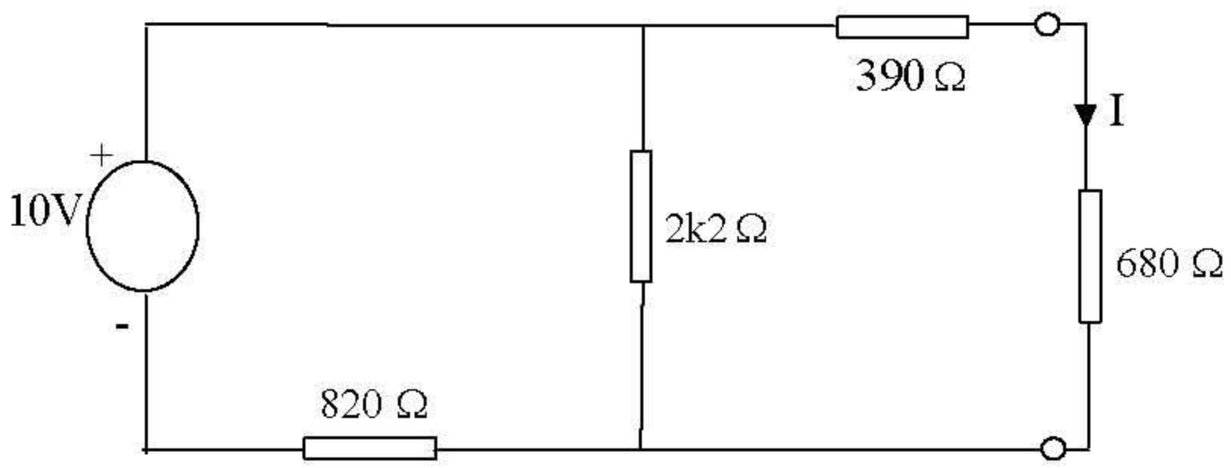
	Std. No	Name	Group	Date
1.	_____	_____	_____	_____
2.	_____	_____	_____	
3.	_____	_____	_____	

Aim of the Experiment: *To find a method of simplifying a network in order to obtain the current flowing in one particular branch of the network*

Step1: Connect the power supply unit to the mains supply line. Ensure that the variable d.c. Control is at minimum. DO NOT switch on yet.

Step2 :Connect up the following circuit as below and apply 10V dc from variable supply

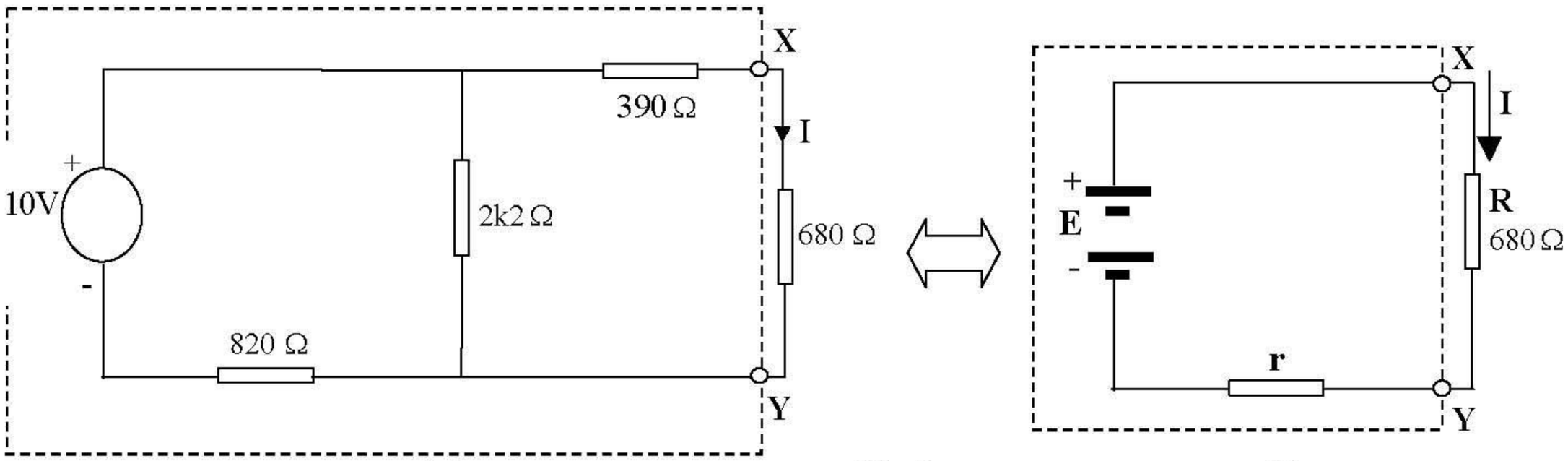
Fig.1



Step3: Measure the current in 680 Ω resistor I=……mA

Q1) Calculate the theoretical value of I using mesh-current law. Does the measured value of current correspond with the calculated value?

Step4:Consider the Thevenin equivalent with open-circuited terminals as shown in Fig 2b



(a) **Fig 2** **(b)**

E represents open circuit voltage of the source, **r** its internal resistance.

Step5: Lets us measure open circuit voltage **E** of the source, and it resistance **r**,

- To measure the voltage, disconnect the 680Ω resistor from the circuit, and measure the voltage between **X** and **Y** as shown in Fig2a.

Q2) The magnitude of **E** was found to be …… volts?

- Now we wish to determine the internal resistance **r** of the equivalent source. The internal resistance of a source is the resistance seen between the terminals of the source (**X** and **Y** in this case) with the source **E** is removed. This gives the network shown in Fig 3.

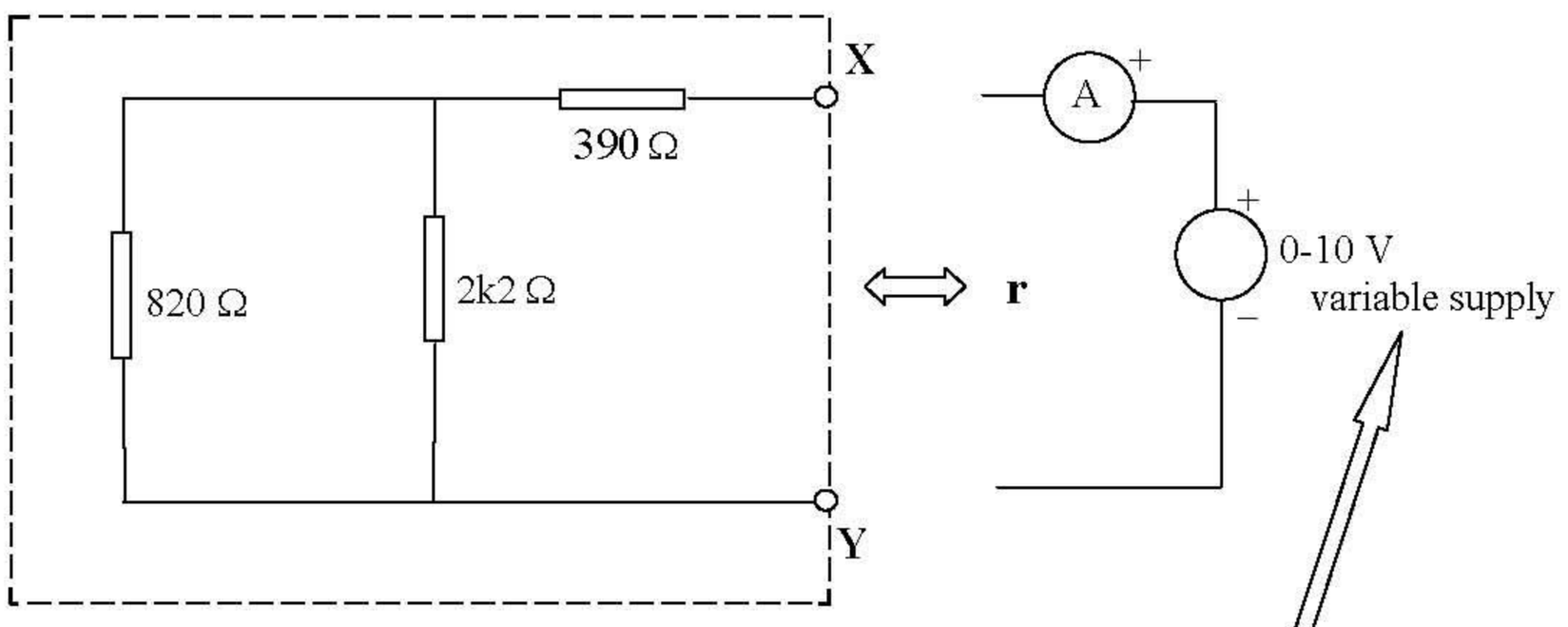


Fig.3

Q3) The magnitude of **r** was found to be …… Ω.

Step6) Or the resistance of the above network may be found by connecting a voltages 2V, 4V, 6V and 8V to points X and Y, and measuring the resultant current, copy these result to following table.

Voltage (V)	Current (mA)	Resistance, **r** (Ω)
2V		
4V		
6V		
8V		
Average value of **r**=		

It can be seen from Fig2b that required Current I, can easily be found by dividing the E by the total resistance

$$I = \frac{E}{R + r}$$ where R is the resistance of required branch

Q4) Calculate the resistance using Ohm's Law, and take the average of the values is found. (insert the average values to above table)

Q5) Calculate $I = \frac{E}{R + r}$ and compare the value with the current measured (in Step3) initially in the 680Ω resistor

Conclusions