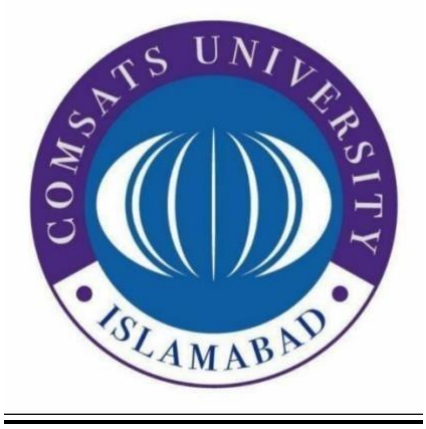
Electric Circuits Analysis

Lab Report # 3



Submitted by:

Haider Ali (FA21-BEE-053)

Muhammad Ahmad (FA21-BEE-095)

Abdul Jalil (FA21-BEE-091)

Submitted To:

Ma’am Rabia Naseem

Lab 03: Experimental Validation of Resistor Combinations - Series andParallel

Resistance in series

The circuit in which the current remaining parts as before and the voltage is diverse across every resistor is known as an arrangement circuit, as demonstrated in Figure 3.1. In an arrangement circuit the complete obstruction is the amount of individual opposition esteems. On the off chance that k number of resistors is associated in arrangement, the same obstruction Req is given by,

$$Req=R1+R_2+R_k$$

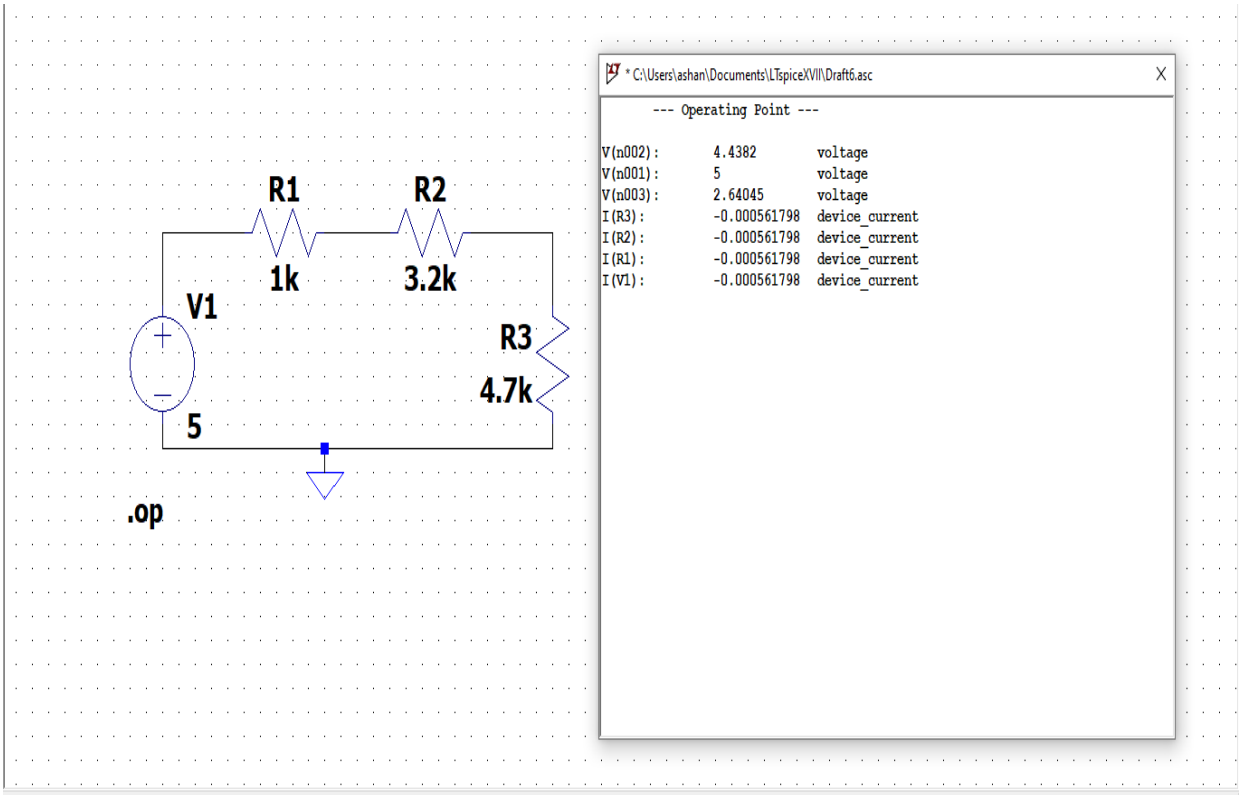


Table 1:

Value of R1 (Ω)	Value of R2 (Ω)	Value of R3 (Ω)	Reqcalculated(Ω)	Reqmeasured(Ω)
1K	3.2k	4.7K	9K	8.78K
iT (mA) calculated	iT (mA) measured	V1 (V) measured	V2 (V) measured	V3 (V) measured
0.556	0.55	0.552	1.823	2.58
iT (mA) Simulated		V1 (V) Simulated	V2 (V) Simulated	V3 (V) Simulated
0.561		0.562	1.798	2.64

Resistances in parallel

In an equal circuit voltage across every one of the resistors stays as before and the inventory current or absolute current is the amount of the individual flows in various equal ways. The amount of the proportional of equal protections associated in the circuit is equivalent to the corresponding of the same obstruction associated in the circuit. On the off chance that k number of resistors is associated in equal, the same opposition Req is given **by,$1/Req=1/R_1+1/R_2+1/R_k$**

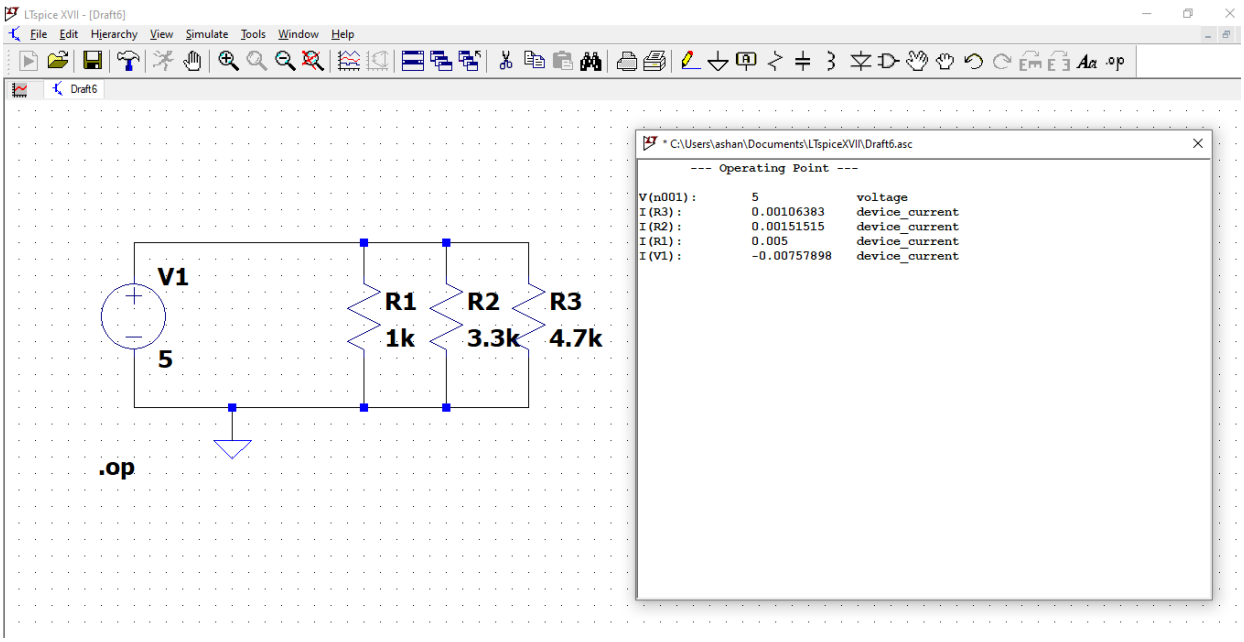


Table 2:

Value of R1 (Ω)	Value of R2 (Ω)	Value of R3 (Ω)	Reqcalculated(Ω)	Reqmeasured(Ω)
1K	3.3K	4.7K	0.6597k	0.656k
iT (mA)calculated	iT (mA)measured	I1 (mA)measured	I2 (mA)measured	I3 (mA)measured
7.58	7.32	4.98	1.52	1.07
iT (mA) Simulated		I1 (mA) Simulated	I2 (mA) Simulated	I3 (mA) Simulated
7.5		5	1.51	1.06

Post lab

Questions

1. **Assume that you have a 100 Ω resistor. You want to add aresistor in series with this 100 Ω resistor in order to limit thecurrent to 0.5 amps when 110 volts is placed across the tworesistors in series. How much resistance should you use?**

Ans:

Req=100+R

V=110V I=0.5amp

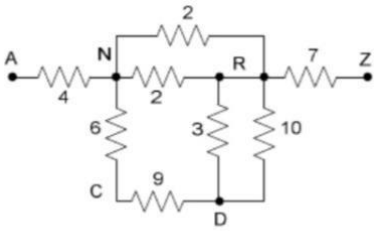
V=IR ;Req=V/I

100+R=110/0.5=220

R=220-100

R=120ohm

2. **Identify the resistances pairs that are in parallel in the following circuit:**

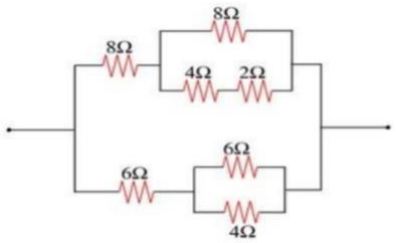


Ans: 3 and 10are in parallel making a 2.3ohm resistor

2 and 2 are in parallel making 1ohm resistor

17.3 and 1 ohm are in parallell

3. **What is the equivalent resistance of the following resistancecombination?**



Ans:

Step1: 2+4=6 (series)

Step2: 6//8= 3.4 (parallel)

Step3: 8+3.4=11.4 (series)

Step4: 4//6= 2.4 (parallel)

Step5: 6+2.4= 8.4 (series)

Step6: 11.4//8.4=4.8 (parallel)

Req=4.8ohm

Critical Analysis/Conclusion:

In this lab, we worked with arrangement and equal circuits. In the first place, we utilized resistors of various qualities to ascertain the same obstruction in arrangement, with voltage animated and current also utilizing LTSpice. We played out the equivalent for equal too and noticed the readings. We likewise understood that the current remaining parts same in arrangement while voltage partitions and the other way around for equal circuits.