Faculty of Engineering and Technology
Department of Electrical and Computer Engineering
CIRCUITS AND ELECTRONICS LABORATORY
ENEE 2103

Experiment _ 2
Pre-Lab _ 1
" Circuit Laws and Theorems "

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Section: 1

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Teaching assistant: Eng. Esmail

Date: 20/9/2021

Part A : KVL, KCL

- Rx = 1 k Ω

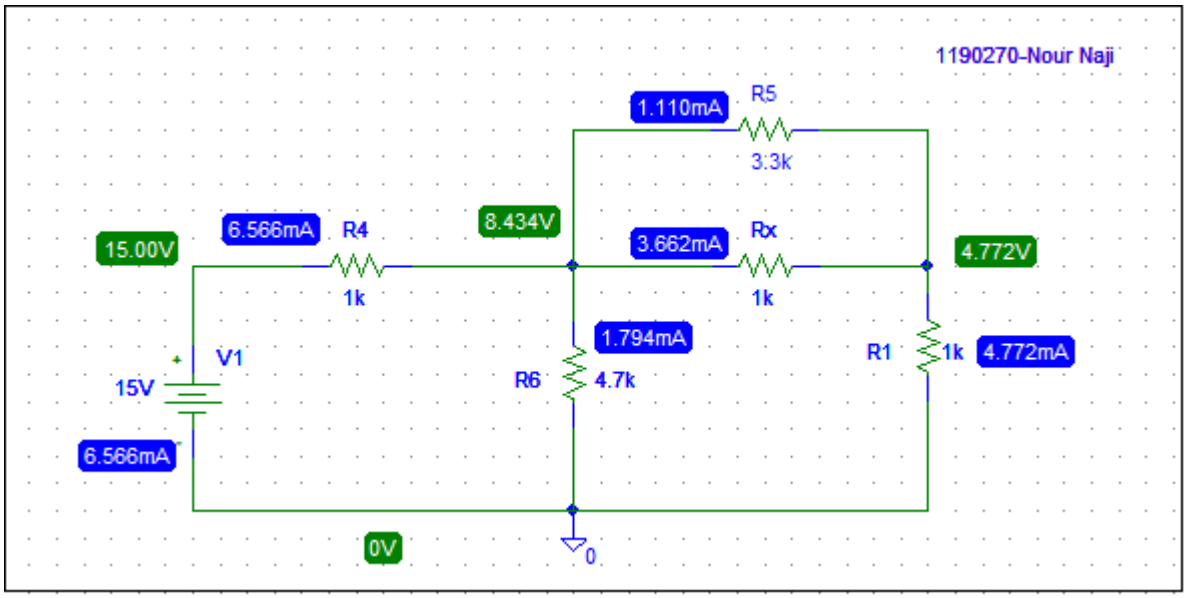

Fig 1 : RX = 1 kΩ

- Rx = 0.5 k Ω

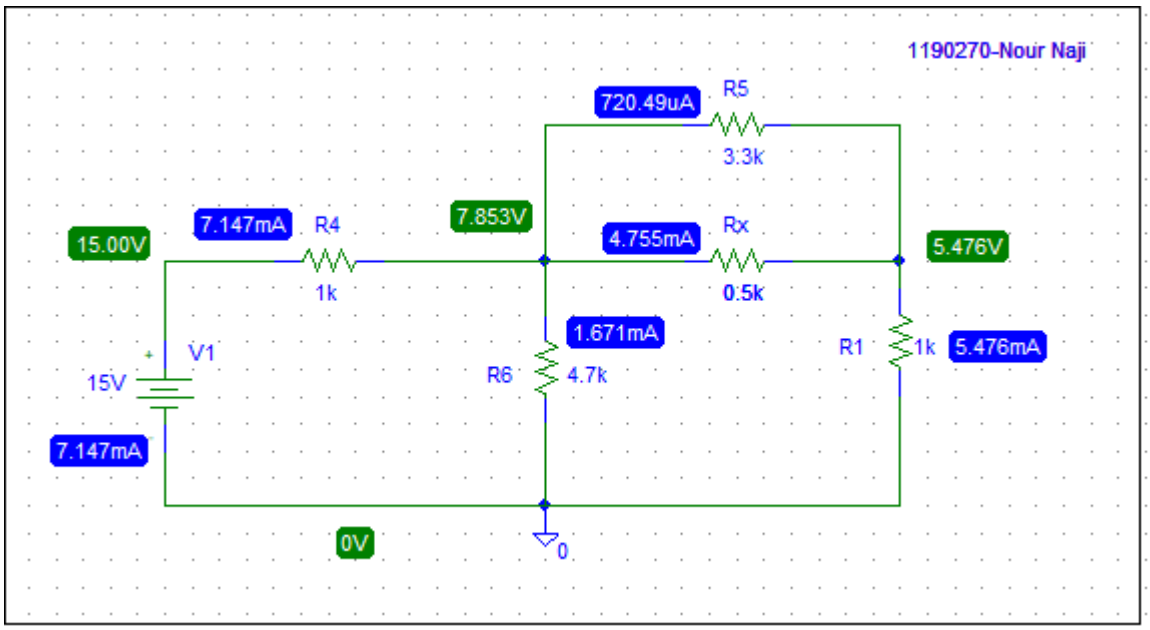

Fig 2 : RX = 0.5 kΩ

VS	POT	R1		R4	
		V1(v)	I1(mA)	V4	I4
15v	Rx	4.772	4.722	6.566	6.566
15v	0.5Rx	5.476	5.476	7.147	7.147

R5		R6		Rx	
V5	I5	V6	I6	Vx	Ix
1.109	1.110	8.434	1.794	3.662	3.662
0.72	0.72	7.853	1.671	4.754	4.775

Part B: Voltage & Current Division:

- Voltage division

- Rx = 1 k Ω

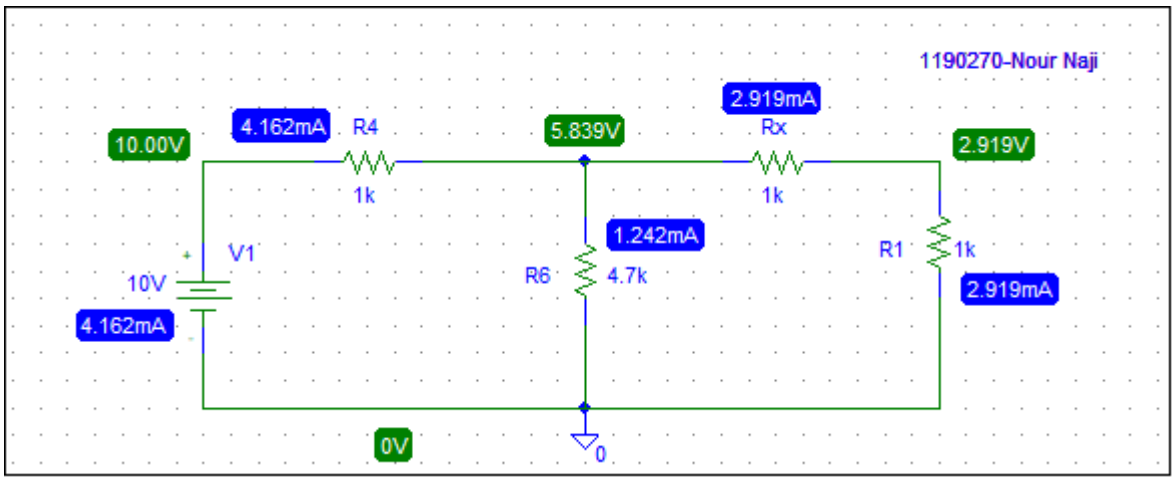

Fig 3 : RX = 1 kΩ

- Rx = 0.5

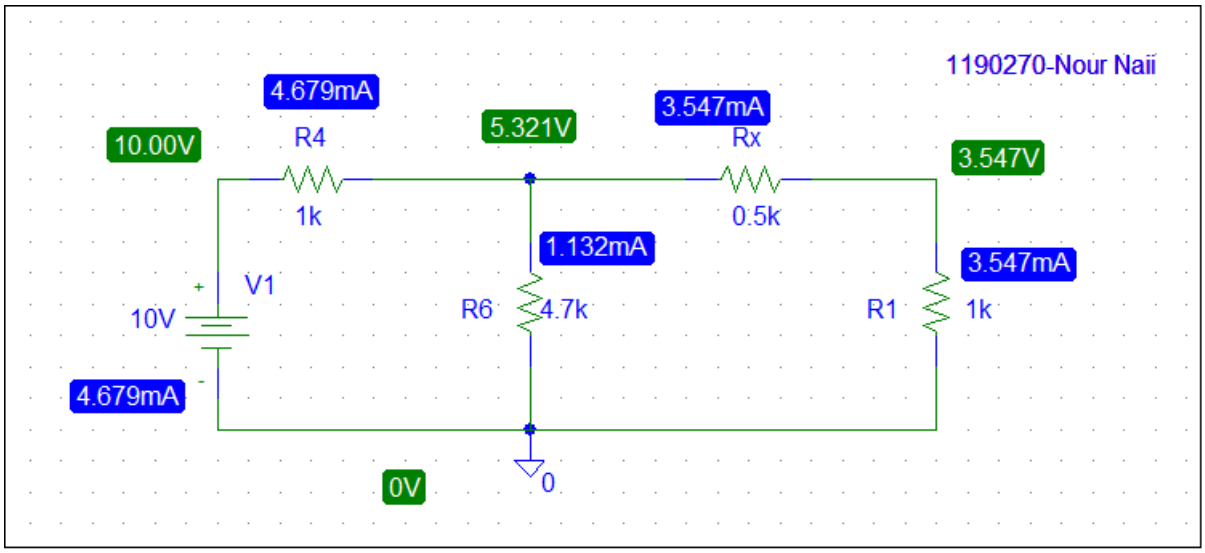

Fig 4 : RX = 0.5 kΩ

VS (VOLT)	POT	V1	V4	V6	VX
10 V	Rx	2.919	4.161	5.839	5.84
10 V	0.5Rx	3.547	4.679	5.321	1.774

- II. Current division

- Rx = 1 k Ω

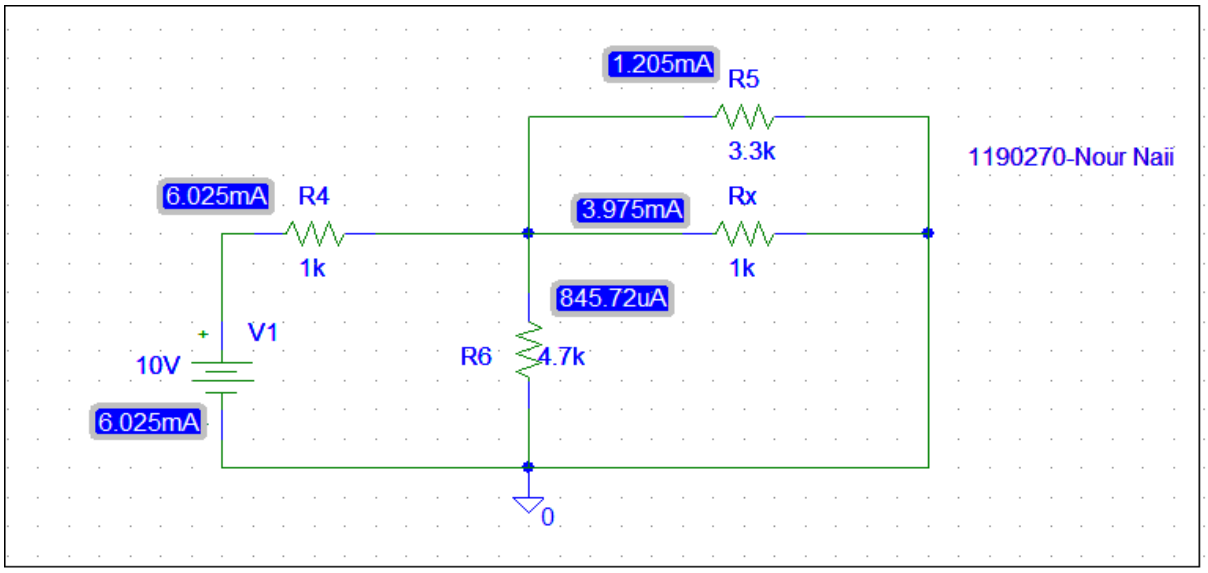

Fig 5 : RX = 1 kΩ

- Rx = 0.5 k Ω

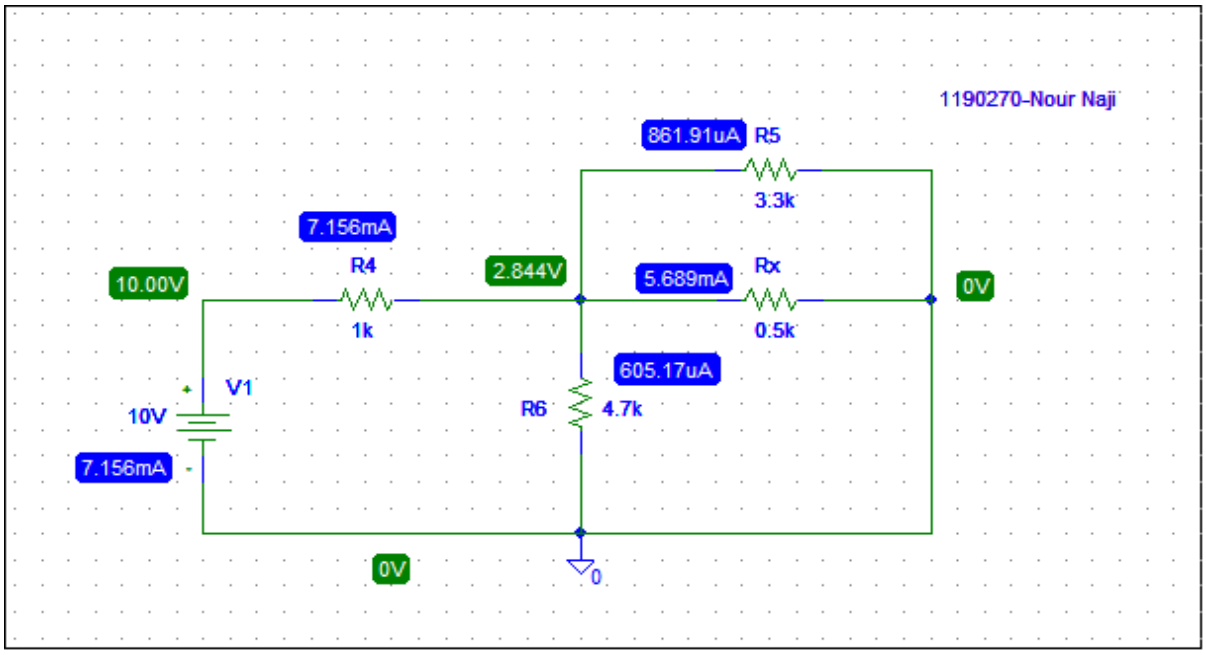

Fig 6 : RX = 0.5 kΩ

VS (VOLT)	POT	I4	I5	I6	IX
10 V	Rx	6.025	1.205	0.845	3.975
10 V	0.5Rx	7.156	0.8619	0.60517	5.689

Part C : Superposition:

- Vs1 = 5v, Vs2 = 10v

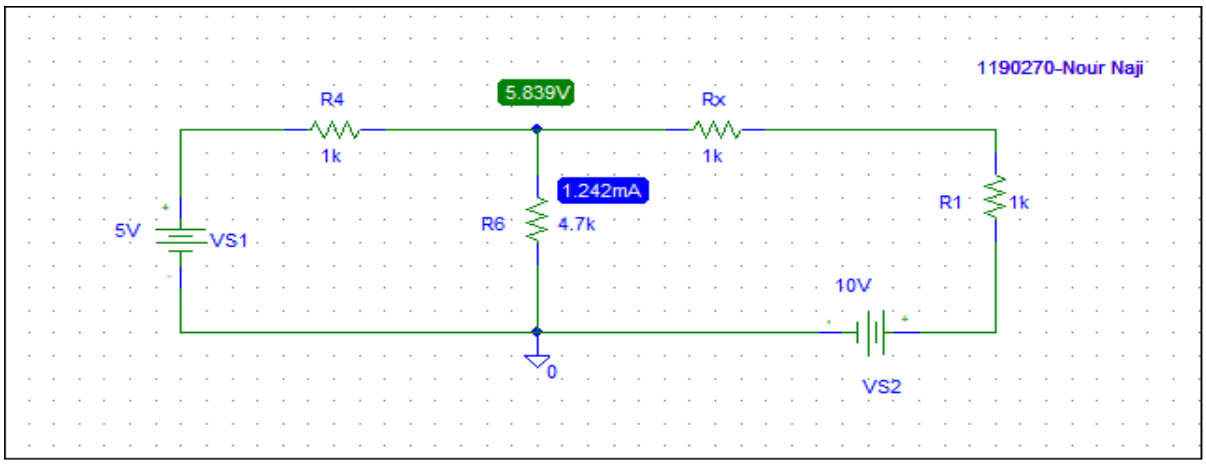

Fig 7 : Vs1 = 5v, Vs2 = 10v

- Vs1 = 0v, Vs2 = 10v

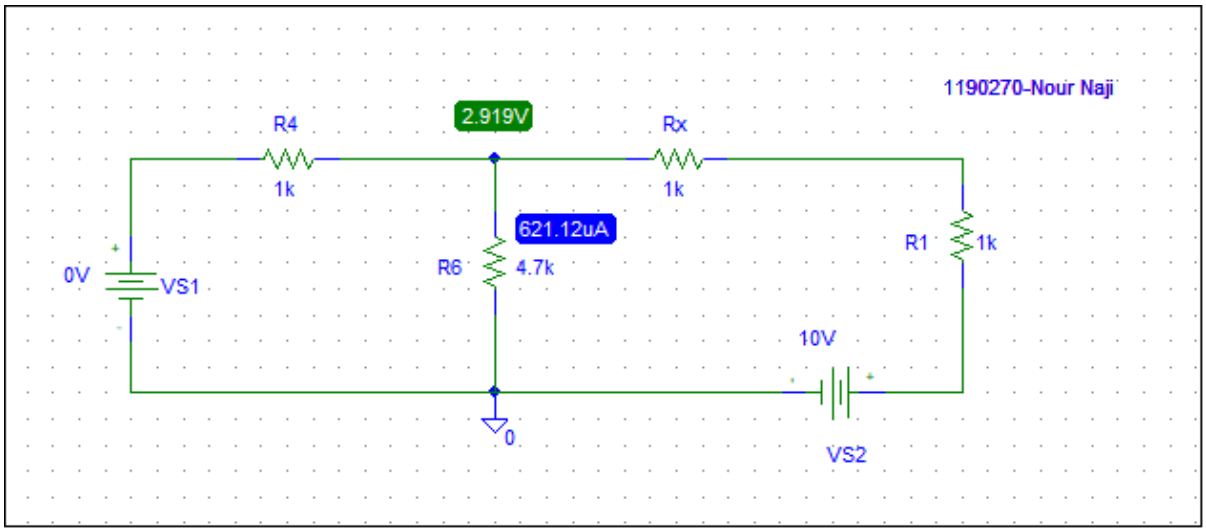

Fig 8 : Vs1 = 0v, Vs2 = 10v

- Vs1 = 5v, Vs2 = 0v

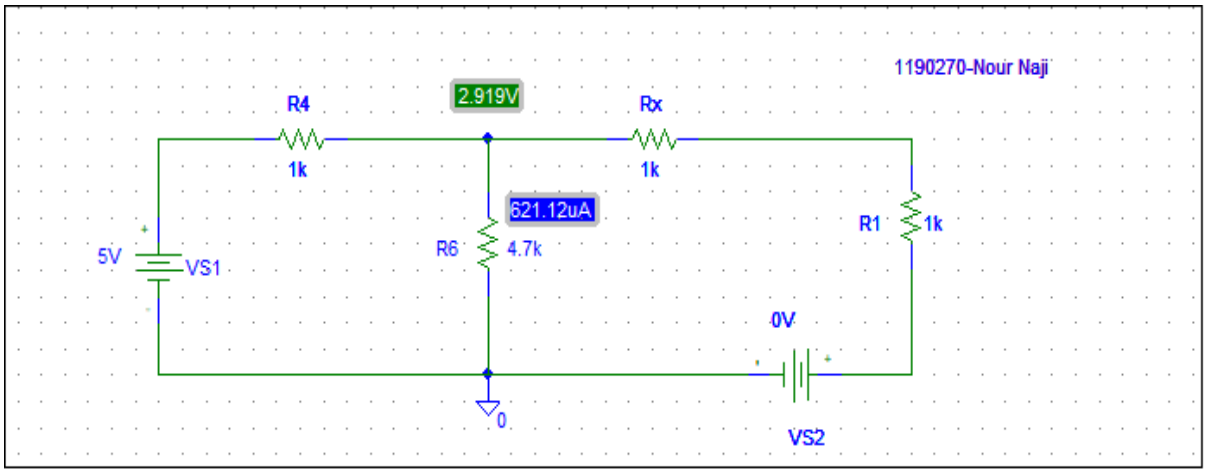

Fig 9 : Vs1 = 5v, Vs2 = 0v

VS1 (VOLT)	*VS2 (VOLT)*	*V6 (VOLT)*	*I6 (MA)*
5	*10*	*8.839*	*1.242*
0	*10*	*2.919*	*0.62112*
5	*0*	*2.919*	*0.62112*

Part D: Thevenin and Norton equivalent circuits:

2-

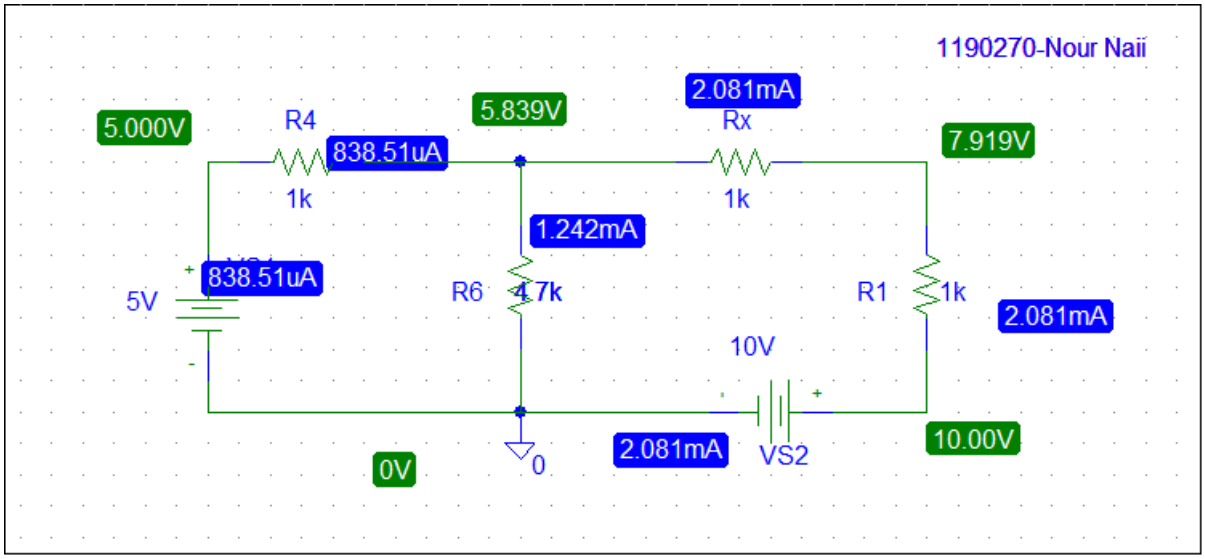

Fig 10

✓ I Rx = 2.081 mA , V Rx = (10 – 7.919) /1 = 2.081 v

3-

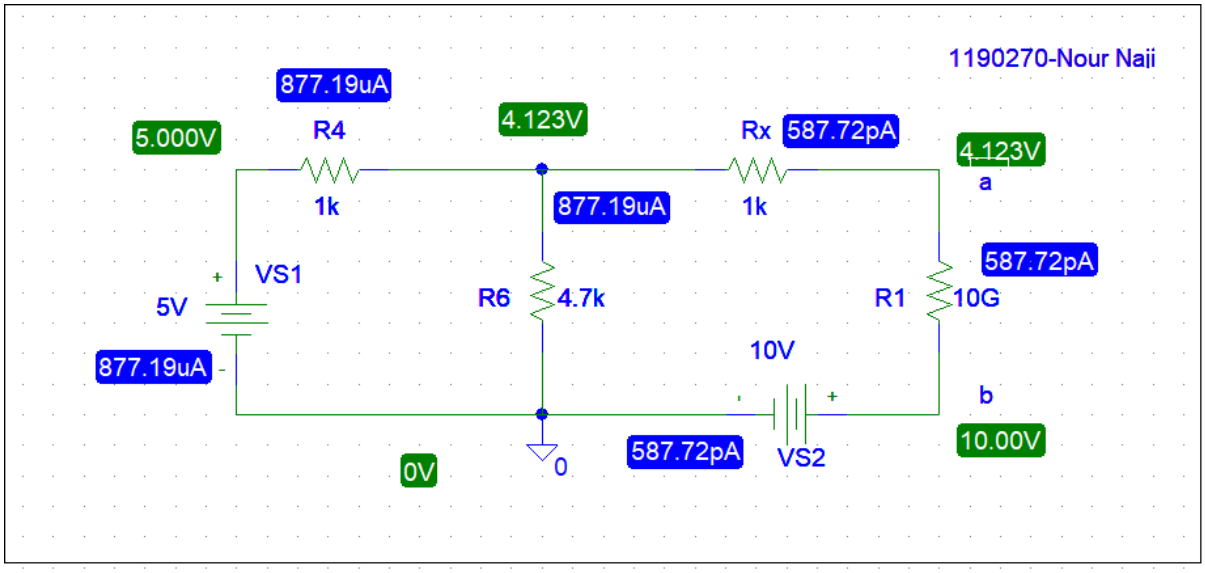

Fig 11

✓ *V_open = V(ab) = 4.123-10 = -5.877 v*

4-

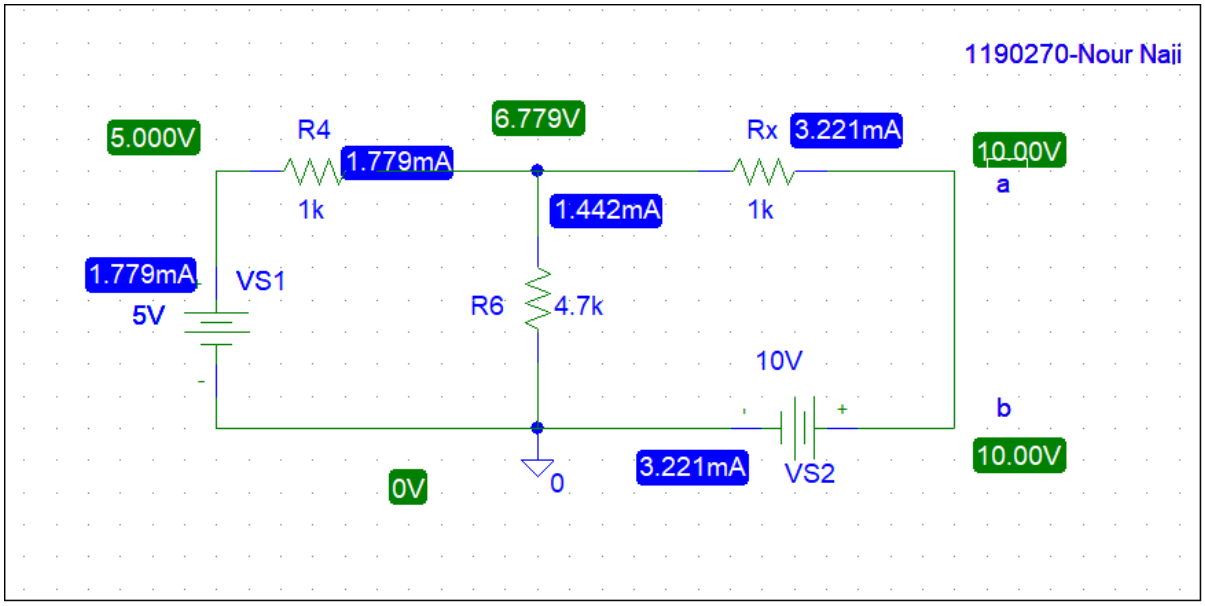

Fig 12

- ✓ Isc = 3.221 mA

5-

Rth = (4.7 // 1) +1 = 1.824 kΩ

7-

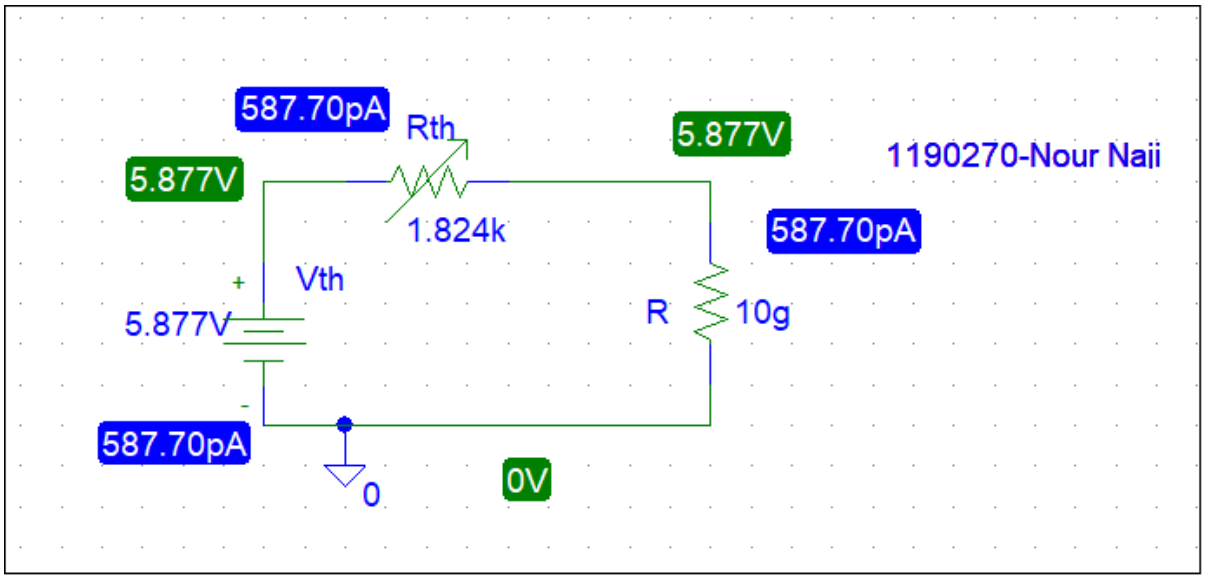

Fig 13

10-

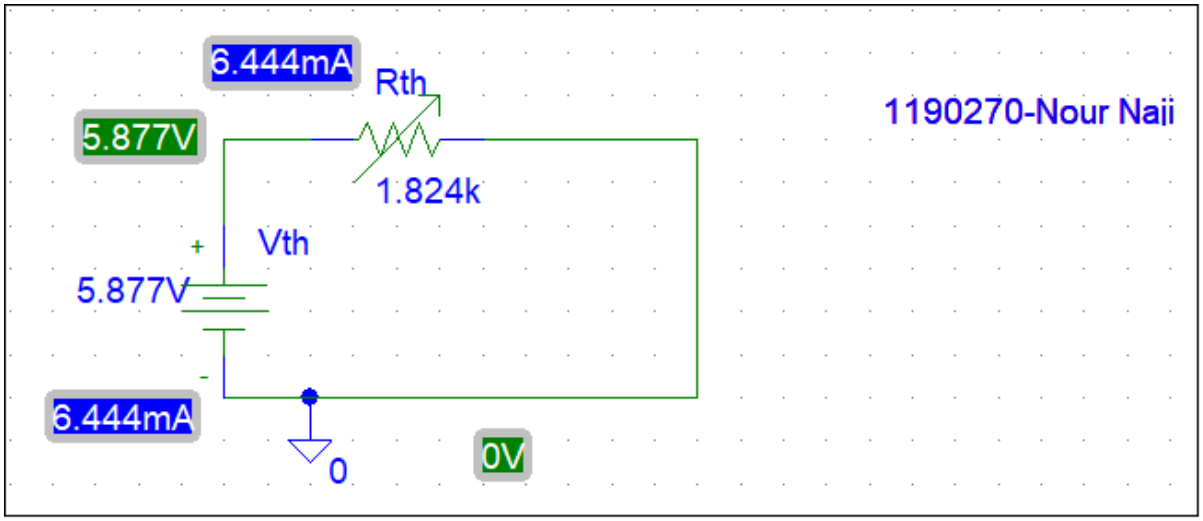

Fig 14

15-

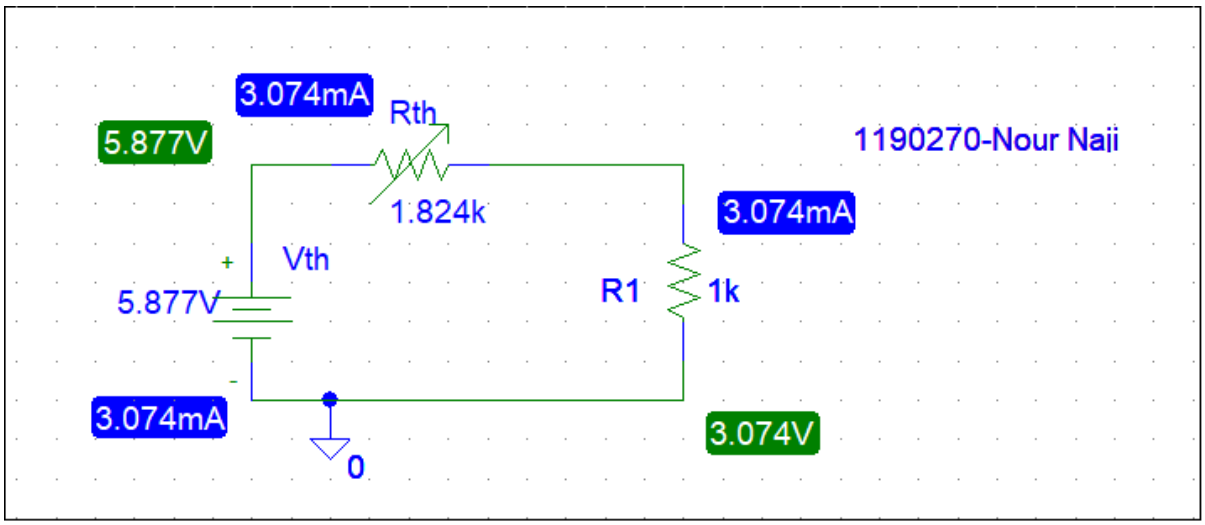

Fig 15