UNIVERSIDADE TECNOLÓGICA FEDERAL DO PARANÁ

RELATÓRIO PRÁTICO DE CIRCUITOS ELÉTRICOS 1

Prática 2

Ponte de Wheatstone

Guilherme Rodrigues do Santos - RA: 2199580

Luiz Eduardo Caldas Kramer - RA: 2199661

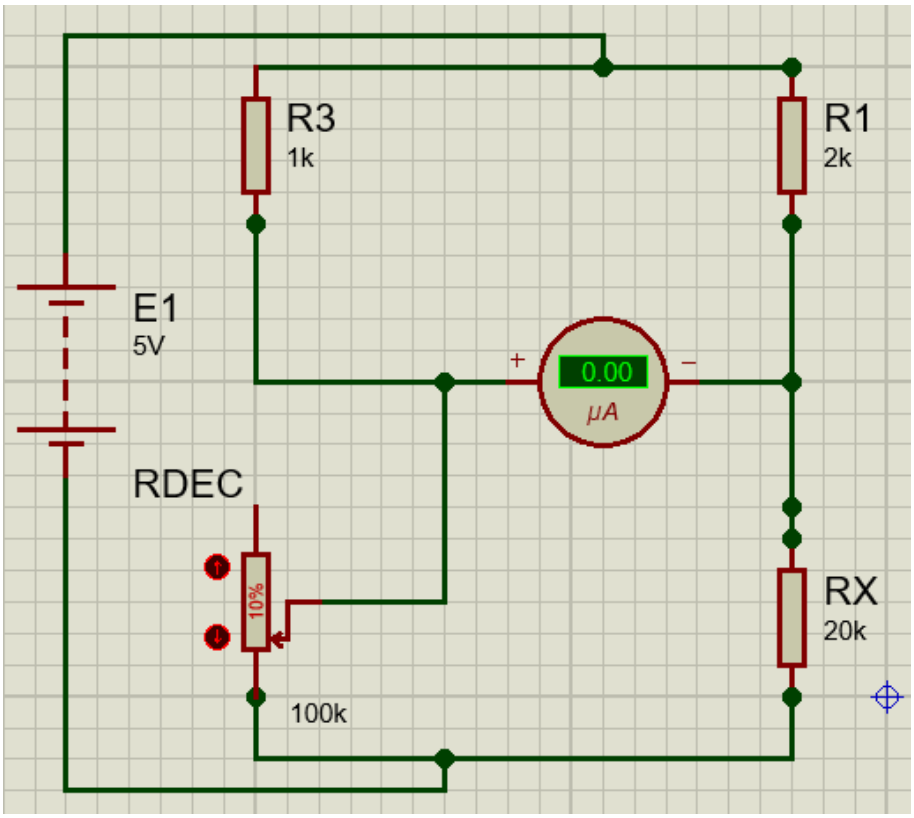
CAMPUS Cornélio Procópio, 2021

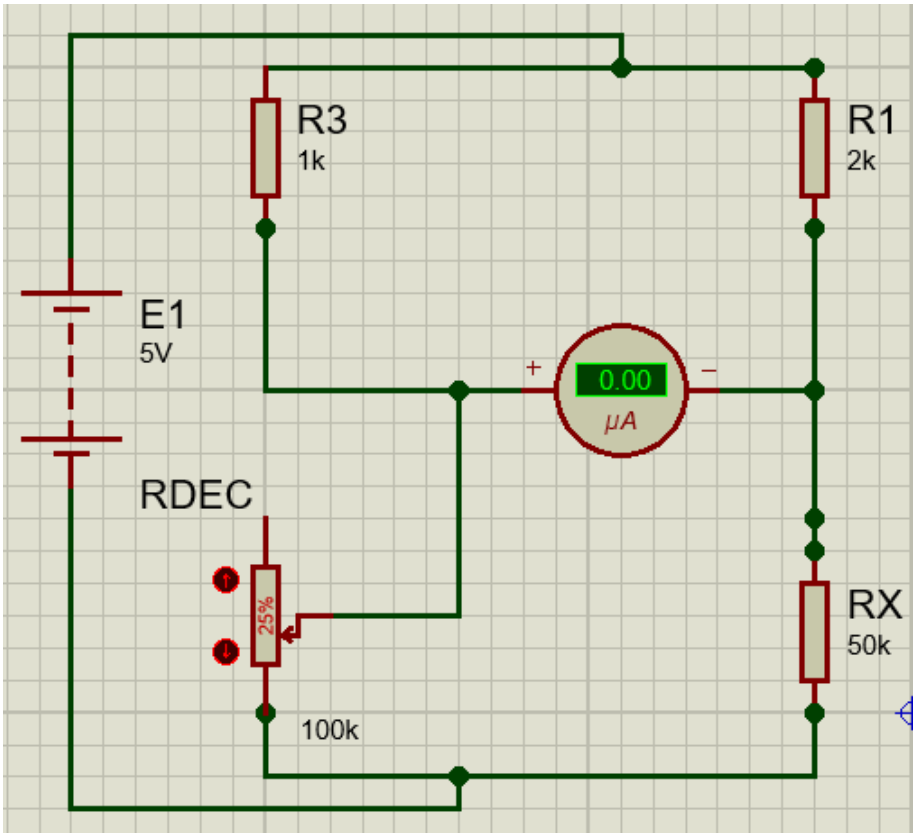
1)

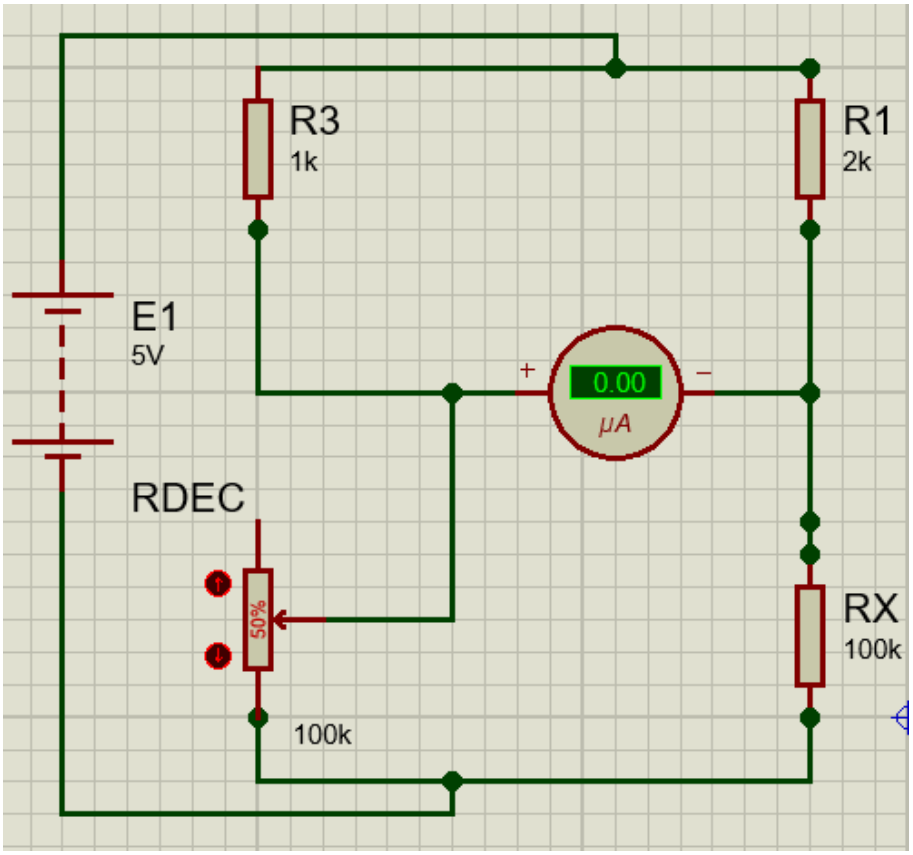
R	R1	R2	Rx	RDec
V	0.83	0.83	4.17	4.16

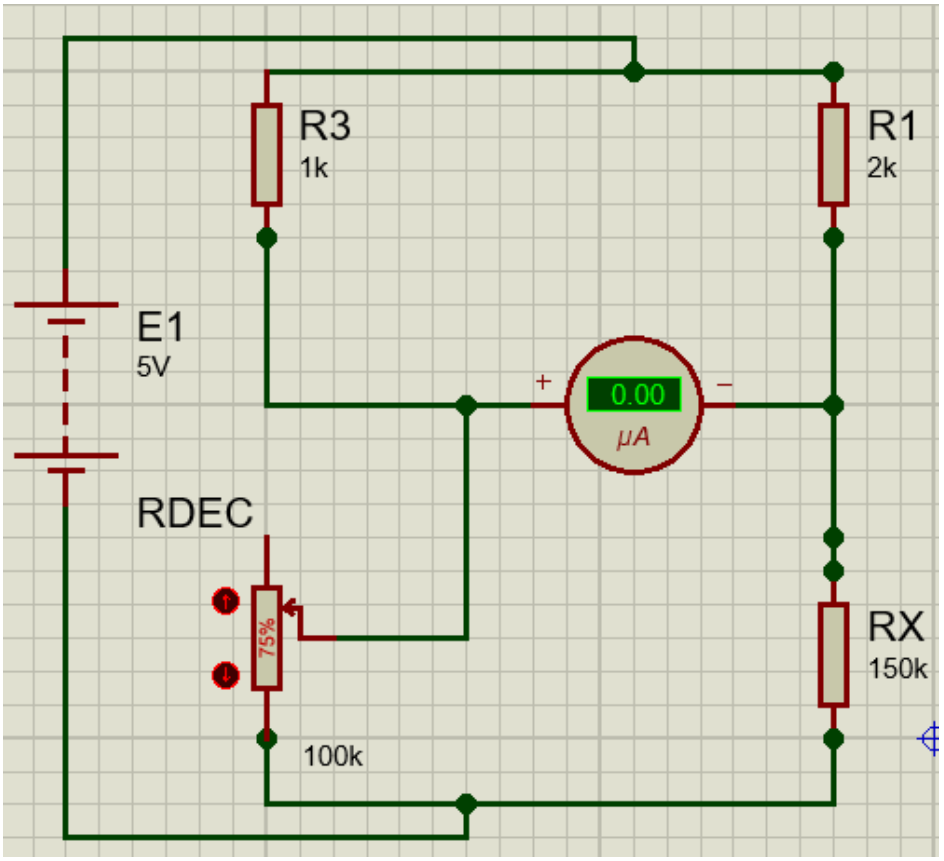
2)

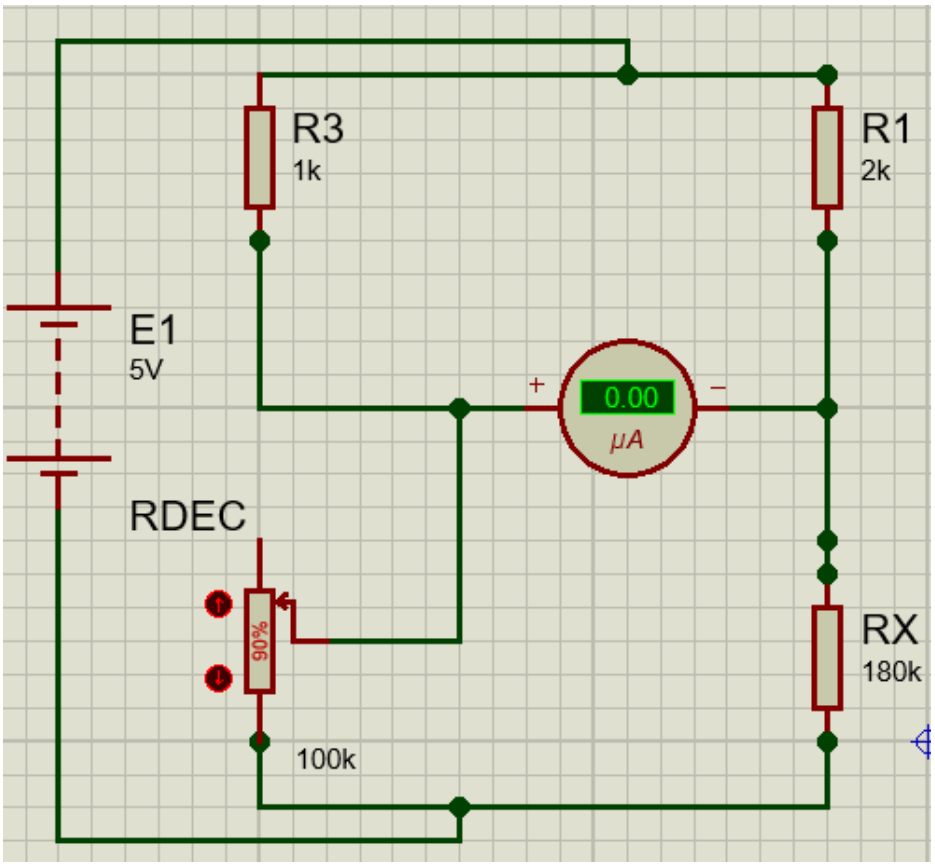
RX	RDec
20kΩ	10kΩ
50kΩ	25kΩ
100kΩ	50kΩ
150kΩ	75kΩ
180kΩ	90kΩ




R3
1k
R1
2k
E1
5V
0.00
μA
RDEC
25%
RX
50k
100k

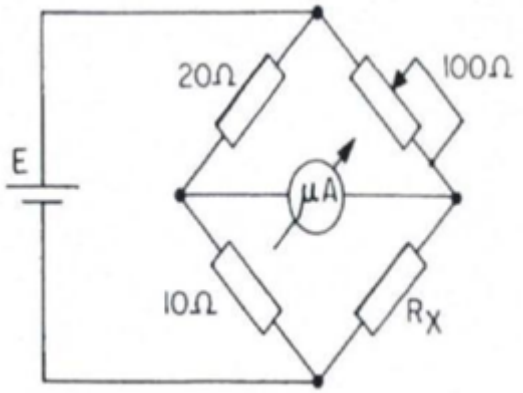

R3
1k
R1
2k
E1
5V
0.00
μA
RDEC
50%
RX
100k
100k


R3
1k
R1
2k
E1
5V
+
0.00
µA
−
RDEC
75%
RX
150k
100k


R3
1k
R1
2k
E1
5V
+
0.00
µA
−
RDEC
90%
RX
180k
100k

Questões:

1)

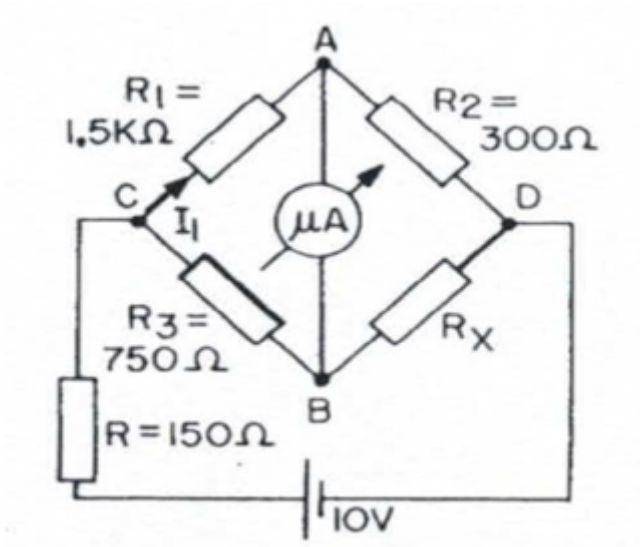


Sabendo que **Rx =($\frac{R1}{R3}$).Rdec**, e R1 = 20Ω, R3 = 100Ω,

RDec = 10Ω, temos:

Rx = ($\frac{20\Omega}{100\Omega}$).10Ω = 5Ω.10Ω = **50 Ω**

2)

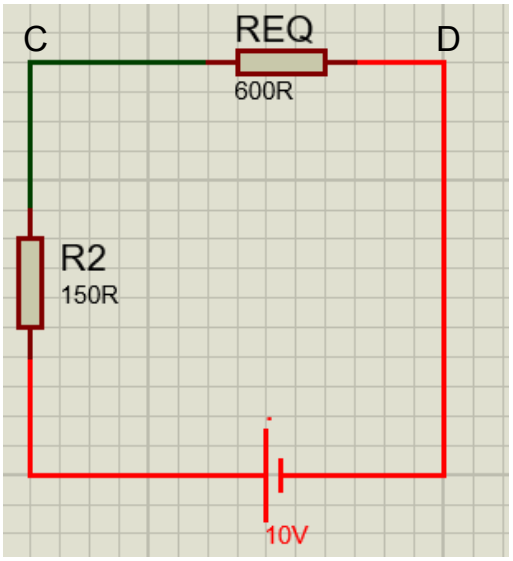


Sabendo que **Rx =($\frac{R1}{R3}$).R2**, e R1 = 1.5kΩ, R2 = 300Ω, R2 = 750Ω, temos:

Rx = ($\frac{750\Omega}{1500\Omega}$).300Ω = **150Ω**, assim a Resistencia equivalente em ABCD:

Req = 1.5kΩ + 300Ω || 750Ω + 150Ω = 1.8kΩ || 900Ω, sabendo que:

Req = $\frac{R1R2}{R1+R2}$ = $\frac{1.8k\Omega * 900\Omega}{2.7k\Omega}$ = 600Ω de modo que o circuito pode ser representado conforme a figura abaixo:



Como os resistores estão em série:
Req = 600Ω + 150Ω = 750Ω, portanto é possível conseguir a corrente.

$I = \frac{U}{R} = \frac{10V}{750\Omega}$ = 13.3 mA

Vcd = 13.3 mA * 600Ω = **8V**

Voltando no circuito inicial, logo após realizar a primeira associação de resistores:

$I_{1,8k\Omega} = I_1$ e $I_{900\Omega} = I_2$

1.8k * I_1= 900 * I_2 = 8V

I_1 = 4.4 mA e I_2 = 8.9 mA

Vr3 = I2 * R3 -> Vr3 = 8,9mA * 750 = **6.67V**

Rx = **150Ω**
Vab = **0V**
Vdc = **8V**
Vr3 = **6.67V**
I1 = **4.4 mA**