

CDE laboratory_01

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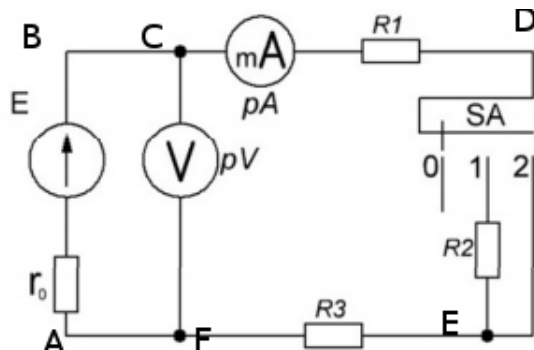


**UNIVERSITATEA TEHNICĂ
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L^AT_EX

1 Verificarea îndeplinirii legilor lui Ohm si Kirchhoff pentru circuitele electrice neramificate si ramificate.



1.1

$R_1(\Omega)$	$R_2(\Omega)$	$R_3(\Omega)$	$I_1(mA)$	$I_2(mA)$	$U_{t1}(V)$	$U_{t2}(V)$
99.8	198	53.7	42.1	96.0	15.01	15.01

1.2

$$r_0 = \frac{U_{t2} - U_{t1}}{I_1 - I_2} = \frac{0}{I_1 - I_2} = 0$$

Aparatele nu au fost destul de fixe si r_0 este o valoare prea mica pentru a fi masurata exact.

1.3

$$I = \frac{E}{R_1 + R_2 + R_3 + r_0} = \frac{15}{351.5} = 42.67 \text{ mA}$$

$$U_1 = IR_1 = 42.67 \cdot 99.8 = 4.26 \text{ V}$$

$$U_2 = IR_2 = 42.67 \cdot 198 = 8.45 \text{ V}$$

$$U_3 = IR_3 = 42.67 \cdot 53.7 = 2.29 \text{ V}$$

1.4

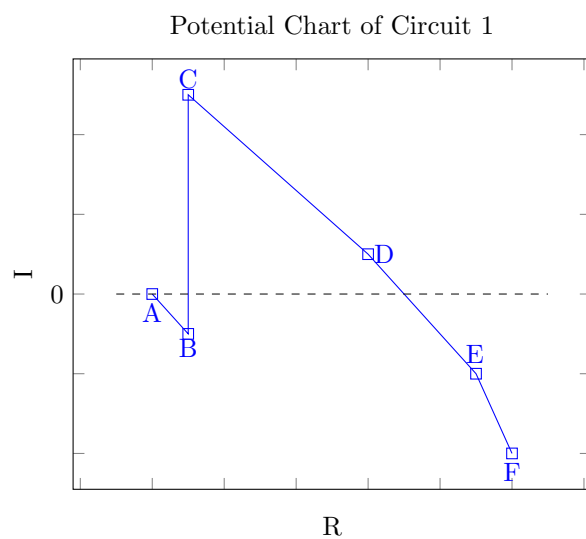
R (Ω)	$I_c(mA)$	U_c (V)	I_m (mA)	U_m (V)
R_1 99.8	42.67	U_1 4.26	42.1	U_1 4.24
R_2 198		U_2 8.45		U_2 8.43
R_3 53.7		U_3 2.29		U_3 2.26

1.5

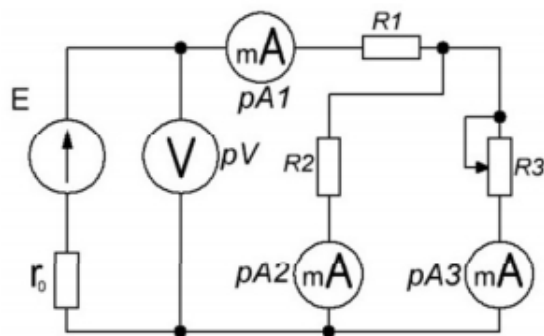
$$U_{c1} + U_{c2} + U_{c3} = 4.26 + 8.45 + 2.29 = \mathbf{15 \text{ V}}$$

$$U_{m1} + U_{m2} + U_{m3} = 4.24 + 8.43 + 2.26 = \mathbf{14.93 \text{ V}}$$

1.6



1.7



$$R_E = R_1 + \frac{R_2 R_3}{R_2 + R_3} = 99.8 + \frac{198 \cdot 473}{198 + 473} = 239.37 \text{ } \Omega$$

$$I_1 = \frac{E}{r_0 + R_E} = \frac{15}{0 + 239.37} = 62.66 \text{ mA}$$

$$U_2 = U_3 = I_1 \frac{R_2 R_3}{R_2 + R_3} = 62.66 \cdot \frac{198 \cdot 473}{198 + 473} = 8.75 \text{ V}$$

$$U_1 = I_1 \cdot R_1 = 61.7 \cdot 99.8 = 6.16 \text{ V}$$

$$I_2 = \frac{U_2}{R_2} = \frac{8.75}{198} = 44.19 \text{ mA}$$

$$I_3 = \frac{U_3}{R_3} = \frac{8.75}{473} = 18.50 \text{ mA}$$

R (Ω)		$I_c(\text{mA})$		$U_c(\text{V})$		$I_m(\text{mA})$		$U_m(\text{V})$	
R_1	99.8	I_1	62.66	U_1	6.16	I_1	61.7	U_1	6.66
R_2	198	I_2	44.19	U_2	8.75	I_2	43.2	U_2	8.69
R_3	473	I_3	18.50	U_3	8.75	I_3	18.6	U_3	8.69