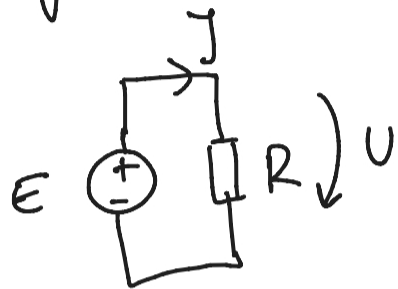


# Seminar electronica I (29.09.2020).

## Legea lui Ohm



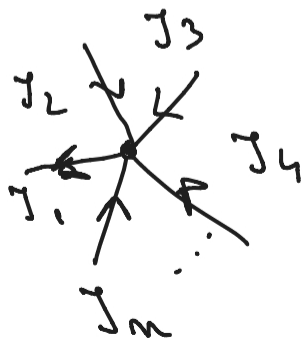
$$U = R \cdot I$$

$$I = \frac{U}{R}$$

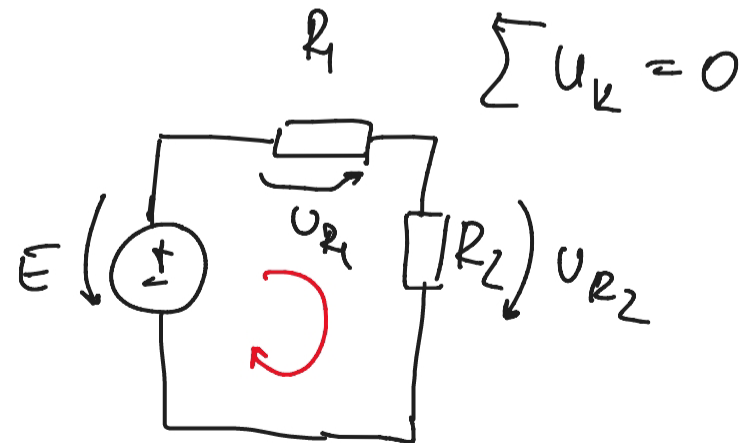
$$\underline{U_{RMS}} = R \cdot \underline{I_{RMS}}$$

$$\underline{U_{pk-pk}} = R \cdot \underline{I_{pk-pk}}$$

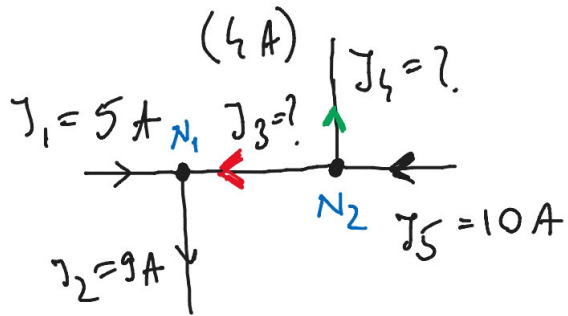
## Legile lui Kirchhoff:



$$\sum I_{in} = \sum I_{out}$$



ex. (1)



$$N_1: J_1 + J_3 = J_2$$

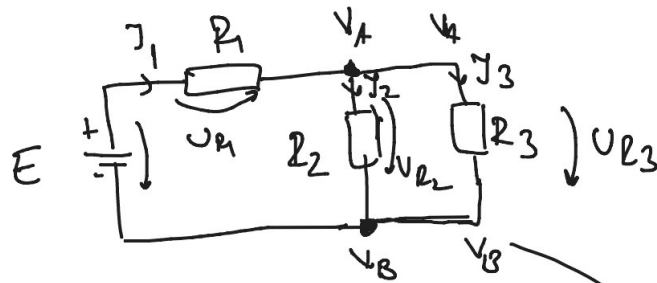
$$J_3 = J_2 - J_1 = 9 - 5 = 4A$$

$$J_1 = J_2 + J_3 \leftarrow \text{presupunem ca } J_3 \text{ iese din } N_1.$$

$$J_3 = J_1 - J_2 = 5 - 9 = \underline{\underline{-4A}}$$

$$J_5 = J_3 + J_4 \Rightarrow 10 = 4 + J_4 \Rightarrow \underline{\underline{J_4 = 6A}}$$

ex. (2)



$$R_1 = R_2 = R_3 = 1k\Omega$$

$$E = 10V$$

$$J_1 = ? \quad J_2 = ? \quad J_3 = ?$$

$$U_{R1}, U_{R2}, U_{R3} = ?$$

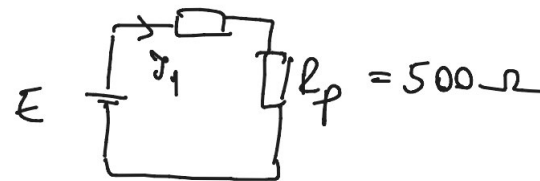
$$J_1 = J_2 + J_3$$

$$R_p = R_2 \parallel R_3 = 500\Omega$$

$$U_{R2} = U_{R3}$$

schemă echivalentă

$$R_1 = 1k\Omega = 1000\Omega$$



$$E = J_1 \cdot (R_1 + R_p) = J_1 \cdot 1500\Omega \Rightarrow J_1 = \frac{10V}{1500\Omega} = 0.00667A = 6.67mA$$

$$\left. \begin{array}{l} R_2 = R_3 \\ U_{R2} = U_{R3} \end{array} \right\} \Rightarrow J_2 = J_3 \quad J_1 = 2J_2 \Rightarrow J_2 = \frac{J_1}{2} = 3.34mA$$

$$U_{R2} = R_2 J_2 = 1000\Omega \cdot 3.34mA = 3.34V = U_{R3}$$

$$U_{R1} = R_1 J_1 = 1000\Omega \cdot 6.67mA = 6.67V$$

# Impedanta:

$$z \text{ [}\Omega\text{]}$$

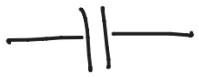
z - rezistența  
x - reactanța.

$$z = R + j \cdot X$$

ideale



$$z_R = R$$



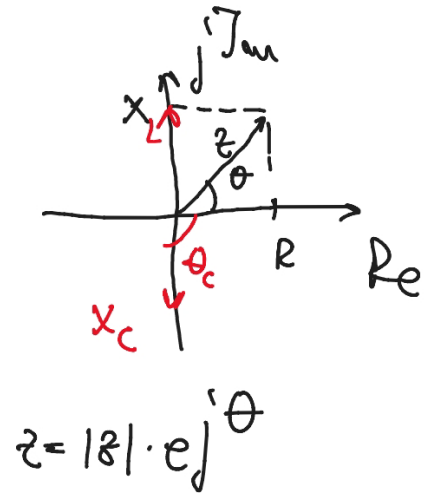
$$z_C = j \cdot X_C$$



$$z_L = j \cdot X_L$$

$$X_C = -\frac{1}{\omega C} = -\frac{1}{2\pi f C}$$

$$X_L = \omega L = 2\pi f L$$



$U = z \cdot I$

pt. C:  $U = |z| e^{j\theta} \cdot I = |z| e^{j \cdot (-\frac{\pi}{2})} \cdot I$

pt. L:  $U = |z| e^{j\theta} \cdot I = |z| e^{j \cdot \frac{\pi}{2}} \cdot I$

$$P = U \cdot I = I^2 \cdot R = \frac{U^2}{R}$$

$$S = P + j \cdot Q$$

$$S = j^2 \cdot z = j^2 (R + j \cdot X) = \underbrace{j^2 R}_P + \underbrace{j \cdot j^2 X}_Q$$

[VA]                      [W]                      [VAR]