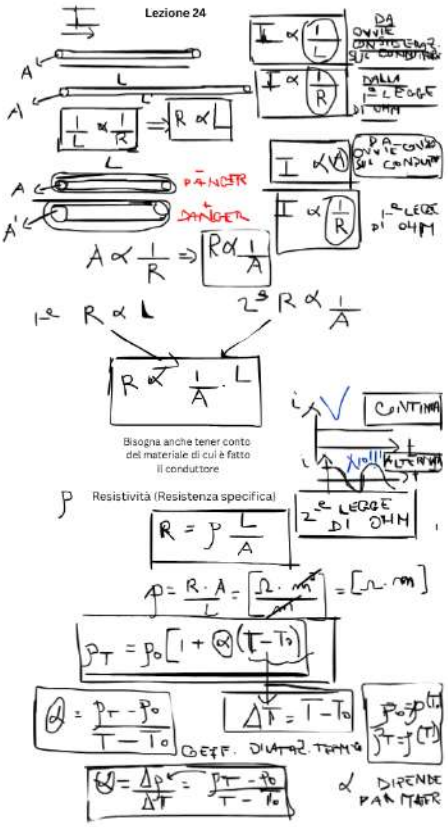
Lezione 24

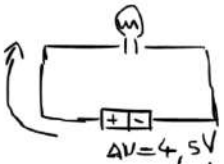

DA DOVE DIPENDE?
DALLA 1ª LEGGE DI OHM
DA CUI DIPENDE?
1ª LEGGE DI OHM
PARAMETER
DANGER
1ª
2ª
Bisogna anche tener conto del materiale di cui è fatto il conduttore
CONTINUA
ALTERNATA
Resistività (Resistenza specifica)
2ª LEGGE DI OHM
COEFF. DILATAZ. TERMICA
DIPENDE

$$P = \frac{U}{\Delta t} = \frac{q \cdot \Delta V}{\Delta t} = i \Delta V$$

$$= i \cdot V = i \cdot Ri = Ri^2 = R \cdot \frac{V^2}{R^2} = \frac{V^2}{R}$$

$V_f = V$

$V_0 = 0$



$i = 0,1\ A$
$\Delta V = 4,5\ V$
$R = ?$
$E = L = ?$
$\Delta t = 1\ h$

$R = \frac{\Delta V}{i} = \frac{4,5\ V}{0,1\ A} = 45\ \Omega$

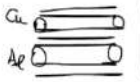
$P = \frac{L}{\Delta t} \Rightarrow L = P \cdot \Delta t = i \cdot \Delta V \cdot \Delta t$
$= 0,1\ A \cdot 4,5\ V \cdot 3600\ s$
$= 1620\ J$

$1\ Kwh = 1\ €$

$= 0,1\ A \cdot 4,5\ V \cdot 1\ h =$
$= 0,45\ W \cdot 1\ h$
$= 4,5 \cdot 10^{-1}\ W \cdot h$
$= 4,5 \cdot 10^{-4}\ Kw\,h$

0,0108 Kwh
0,324 Kw mensili

$X = 4,5 \cdot 10^{-4}$



$L_1 = 200m \quad R_1 = 2\Omega$

$L_2 = 200m \quad R_2 = 2\Omega$

$A_1 = ?$

$A_2 = ?$

$P_1 = ?$

$P_2 = ?$

$\rho_{Cu} = 1,7 \cdot 10^{-8}\ \Omega \cdot m$

$\rho_{Al} = 2,8 \cdot 10^{-8}\ \Omega \cdot m$

$\rho_{S(Cu)} = 8900\ kg/m^3$

$\rho_{S(Al)} = 2700\ kg/m^3$

$R = \rho \cdot \frac{L}{A}$

$R_1 = \rho_{Cu} \cdot \frac{L_1}{A_1}$ $\qquad R_2 = \rho_{Al} \cdot \frac{L_2}{A_2}$

$A_1 = \rho_{Cu} \cdot \frac{L_1}{R_1}$ $\qquad A_2 = \rho_{Al} \cdot \frac{L_2}{R_2}$

$A_1 = 1,7 \cdot 10^{-8}\ \Omega m \cdot \frac{200\ m}{2\ \Omega} = 1700 \cdot 10^{-8}\ m^2$

$A_2 = 2,8 \cdot 10^{-8}\ \Omega m \cdot \frac{200\ m}{2\ \Omega} = 280 \cdot 10^{-8}\ m^2$

$d_{Cu} = \frac{m_1}{V_1} \Rightarrow m_1 = d_{Cu} V_1$ $\quad V_1 = A_1 l_1$

$= 8900\ kg \cdot 1700 \cdot 10^{-8}\ m^2 \cdot 200\ m$

$= 302\,600\,000 \cdot 10^{-8}\ kg$

$m_1 = 3026\ kg$

$d_{Al} = \frac{m_2}{V_2} \Rightarrow m_2 = d_{Al} V_2$ $\quad V_2 = A_2 l_1$

$m_2 = 2700\ kg \cdot 280 \cdot 10^{-8}\ m^2 \cdot 200\ m$

$= 19\,120\,000 \cdot 10^{-8}\ kg$

$= 1,51\ kg$

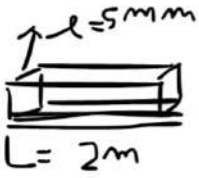
$P_1 = m_1 g = 3,026\ kg \cdot 9,81\ \frac{m}{s^2} = 29,68\ N$

$\approx 29,7\ N$

$\approx 1,30\ N$

$P_2 = m_2 g = 1,51\ kg \cdot 9,81\ \frac{m}{s^2} \approx 14,81\ N$

$\approx 15\ N$



R = ?

$\rho_{Al} = 2.8 \cdot 10^{-8}\ \Omega m$

l = 5 mm

L = 2 m

$$R = \rho \frac{L}{A}$$

$$A = l^2 = (5 \cdot 10^{-3}\ m)^2 = 25 \cdot 10^{-6}\ m^2$$

$$R = 2.8 \cdot 10^{-8}\ \Omega \cdot m \cdot \frac{2\ m}{25 \cdot 10^{-6}\ m^2}$$

$$R = \frac{2.8 \cdot 2 \cdot 10^{-8} \cdot 10^{6}}{25}\ \Omega =$$

$$R = 0{,}224 \cdot 10^{-2}\ \Omega = 2{,}24 \cdot 10^{-3}\ \Omega$$