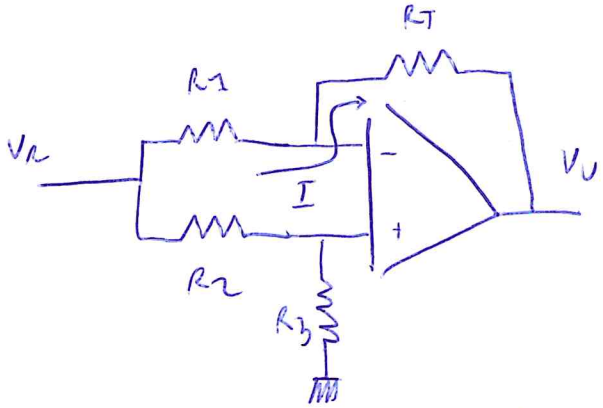
ESERCIZIO 1



RISOLUZIONE CIRCUITO → LEZIONE

$$V_U = I\left(\frac{R_1 R_3}{R_2} - R_T\right) = I(R_1 - R_T)$$

$$I = \frac{V_R}{R_1}\left(\frac{R_2}{R_1+R_3}\right) = \frac{V_R}{2R_1} = 2\ mA$$

$$R_T^{(T_S)} = R_0\, e^{\left(\beta\left(\frac{1}{T_S} - \frac{1}{T_0}\right)\right)} \longrightarrow \text{LINEARIZZO ATTORNO A } 37\,^\circ C \longrightarrow R_C(T_S)$$

$$R_C(T_S) = R_{C1}\left(1 + \alpha_1 (T_S - T_1)\right) \qquad T_1 = 37\,^\circ C$$

$$R_{C1} = R_0\, e^{\beta\left(\frac{1}{273+37} - \frac{1}{273+T_0}\right)} = 215.37\,^\circ C$$

$$\alpha_1 = -\frac{\beta}{(273+37)^2} = -0.0468\ ^\circ C^{-1}$$

$$V_U = I\left(R_1 - R_{C1} - R_{C1}\alpha_1 (T_S - T_1)\right) = -I R_{C1}\alpha_1 (T_S - T_1)$$

$R_1 = 215.37\,\Omega \Rightarrow R_1 \cong R_{C0}$

$$V_U = S\,\Delta T \qquad \Delta T = T_S - T_1$$

$$S = -I R_{C1}\alpha_1 = 0.02\ V/C$$

$$\Rightarrow \Delta T = \frac{V_U}{S} = \frac{0.04}{0.02} = 2\,^\circ C \Rightarrow \boxed{T_S = \Delta T + 1 = 39\,^\circ C}$$

$$|ERRORE| = \left|\frac{\Delta V}{S}\right| = \left|\frac{R_C(T_S) - R_C(T_S)}{S}\right|$$

$$\Delta V = (I R_1 - I R_C) - (I R_1 - I R_T) \qquad S = -I R_{C1}\alpha_1$$

$$\frac{\Delta V}{S} = \frac{-IR_{c} + IR_{T}}{IR_{c1}\alpha_1} = \frac{\Delta R}{R_{c1}\alpha_1}$$

$$\left|\frac{\Delta V}{S}\right| = \frac{R_T(39) - R_c(39)}{0.0468 \cdot 215.37} = 0.1\ ^\circ C$$

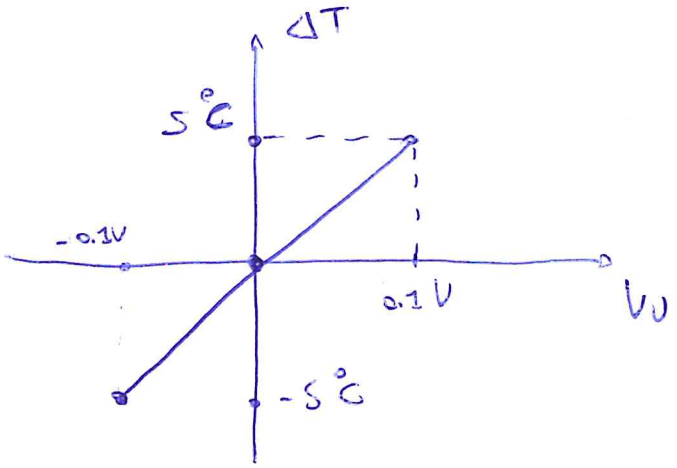
$$R_T(39) = R_0 e^{\beta\left(\frac{1}{273+39} - \frac{1}{273+b}\right)} = 196.24\ \Omega$$

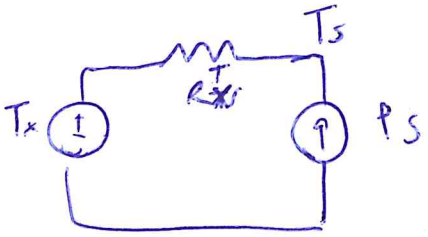
$$R_c(39) = R_{c1}(1 + \alpha_1 (2)) = 195.21\ \Omega$$

$$C = \frac{1}{S} = 50\ ^\circ C/V \qquad \Delta T = C V_u$$

$32\ ^\circ C \rightarrow \Delta T = -5\ ^\circ C \Rightarrow V_u = -0.1\ V$

$42\ ^\circ C \rightarrow \Delta T = 5\ ^\circ C \Rightarrow V_u = 0.1\ V$





$$P_S = R_T(T_S) I^2$$

$$\Delta T = T_S - T_x$$

CINGHIALE ATTORNO A $T_x = 40\ ^\circ C$

$$R_c^2 = R_{c2}\left(1 + \alpha_2 (T_S - T_x)\right)$$

$$R_{c2} = R_T(40^\circ C) = 180.40\ \Omega \qquad \alpha_2 = \frac{-\beta}{(273+40)^2} = -0.0453\ C^{-1}$$

$$\Delta T = \frac{R^T_{xs} R_{c2} I^2}{1 - \varphi_2 R^T_{xs} R_{c2} I^2} = 0.04\,^{\circ}C$$

$$T_s = 40\,^{\circ}C + \Delta T = 40.04\,^{\circ}C$$

$$|\text{ΕΛΛΟΣ}| = \left| \frac{R_T(T_s) - R_c(T_s)}{0.0681 \cdot 215.37} \right| = 0.23\,^{\circ}C$$

$$T_{\text{ΜΙΣΟΥΜΕΝΟ}} = T_s - \Delta T = 39.81\,^{\circ}C$$

ΤΕΟΡΙΑ ⟶ ΒΛΕΠΕ ΕΝΟΤΗΤΑ Β