

Zadaci za vježbu

28.04. 2009.

Pomočni svitak

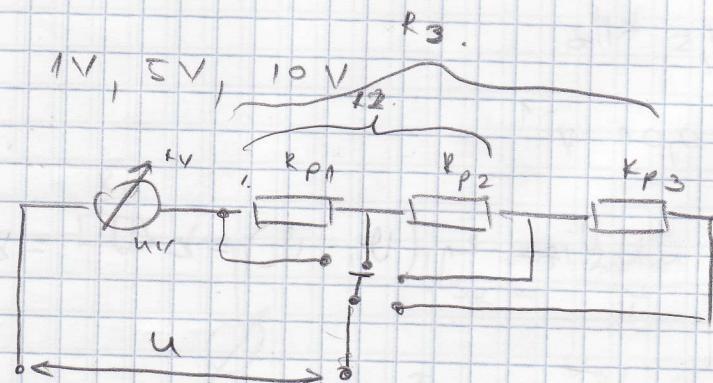
$$R_{P1}$$

$$R_{P2}$$

$$R_{P3}$$

$$I_v = 1 \mu A$$

$$R_V = 100 \Omega$$



$$u_v = I_v \cdot R_V = 100 \mu V$$

$$\frac{1}{I_v} = \frac{R_V}{u_v} = 1000$$

$$R_{P1} = \frac{R_V}{u_v} (U_1 - u_v) = 900 \Omega$$

$$R_2 = \frac{R_V}{u_v} (U_2 - u_v) = 4900 \Omega$$

$$R_{P2} = R_2 - R_{P1} = 4k \Omega$$

$$R_3 = \frac{R_V}{u_v} (U_3 - u_v) = 3900 \Omega$$

$$R_{P3} = R_3 - R_2 = 5k \Omega$$

3.

Termo prenávnik

$$U_{m1} = 5V$$

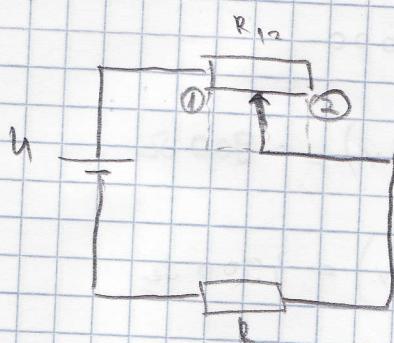
$$f = 1,5 \text{ kHz}$$

$$k = 0,09 \text{ V}^{-1}$$

$$U_{12} = k_n (U_1 - U_2) = k \cdot U^2 = k \cdot \left(\frac{U_m}{\sqrt{2}}\right)^2 = k \cdot \frac{U_m^2}{2}$$

$$= 125 \text{ mV}$$

4. Klinový odporník



$$R_{12} = k$$

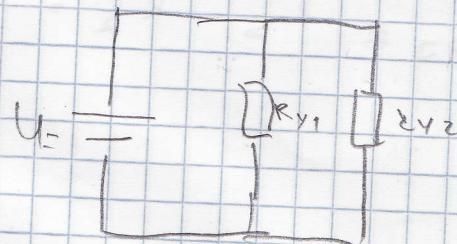
- A) U do U_{12}
 B) 0 do U
 C) 0 do U_{12}
 D) U_{12} do U_{12}
 E) U do U_{12}

$$5. R_{Y1} = 25 \text{ k}\Omega$$

$$R_{Y2} = 50 \text{ k}\Omega$$

$$U = 10 \text{ V}$$

Pokaždé isto: 10 V



6. Farní použitie?

$$f = 10 \text{ kHz}$$

$$R = 10 \Omega$$

$$C < 100 \text{ pF}$$

$$L = 20 \mu\text{H}$$

$$\text{točno } \tan \phi = \frac{1_n(z)}{R_e(z)} = \omega \left[\frac{L}{C} (1 - \omega^2 L^2) - RC \right]$$

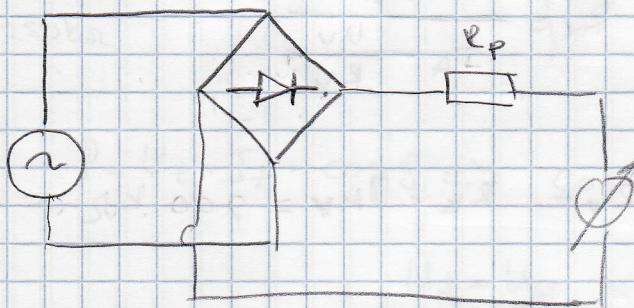
$$\text{priблиžne: } \phi = \omega \tau = \omega \left(\frac{L}{R} - R \cdot C \right) = 0,1256$$

7.

$$R_y = 200 \Omega$$

$$I_y = 0,5 \text{ mA}$$

$$R_p = 3612,7 \Omega$$



$$U_{SR} = \frac{2U_m}{\pi}$$

$$I_{SR} = \frac{U_m}{R_L} = \frac{2U_m}{\pi(R_p + R_L)}$$

$$I_{SR\text{MAX}} = I_y$$

$$U_m = \frac{I_y \cdot \pi(R_p + R_L)}{2} = 3V$$

Zadaci - predavanja

Pr. 1)

$$U_i = 12V$$

$$U_i = U_{SR} \cdot \xi_0$$

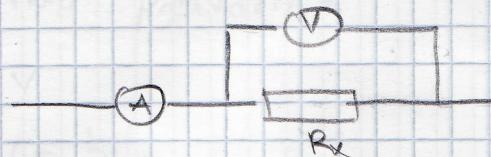
pravoučni oblik:

$$U_{SR} = U_{ef} = U_m$$

$$U_{ef} = U_{SR} = \frac{U_i}{\xi_0} = \frac{12}{\pi} = 10,8V$$

$$\text{Pogreška: } \frac{U_{SR} \cdot \xi_0 - U_{SR} \xi}{U_{SR} \cdot \xi} = \frac{\xi_0 - \xi}{\xi} = 1/3$$

Pr. 2



$$R_k = 2 \text{ k}\Omega / V$$

$$U_{MV} = 100 \text{ V}$$

$$I_{MA} = 1 \text{ A}$$

$$R_A = 1 \Omega$$

$$U_V = 57 \text{ V}$$

$$I_A = 0,85 \text{ A}$$

$$R_X = \frac{U_V}{I_A - \frac{U_V}{R_V}}$$

$$R_V = R_k \cdot U_{MV} = 200 \text{ k}\Omega$$

$$R_X = 67,1 \Omega$$

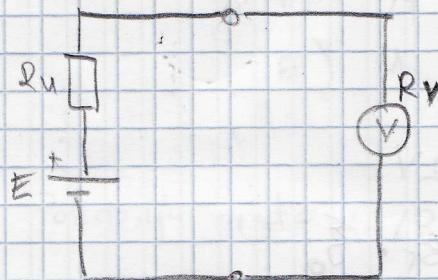
Pr. 3

$$R_k = 2 \text{ k}\Omega / V$$

$$U_{MV} = 10 \text{ V}$$

$$U_V = 6,25 \text{ V}$$

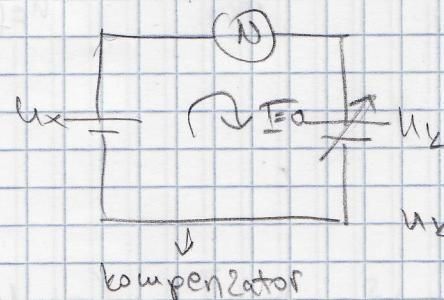
$$\underline{R_u = ?}$$



$$U_V = E \cdot \frac{R_V}{R_u + R_V}$$

$$U_V (R_u + R_V) = E \cdot R_V$$

$$R_u = R_V \cdot \frac{E - U_V}{U_V}$$



$$E = U_X$$

$$R_V = U_{MV} \cdot R_k$$

$$R_u = R_V \cdot \frac{U_X - U_V}{U_V}$$

$$= R_k \cdot U_{MV} \cdot \frac{U_k - U_V}{U_V}$$

$$R_u = 512 \Omega$$

4. Pr

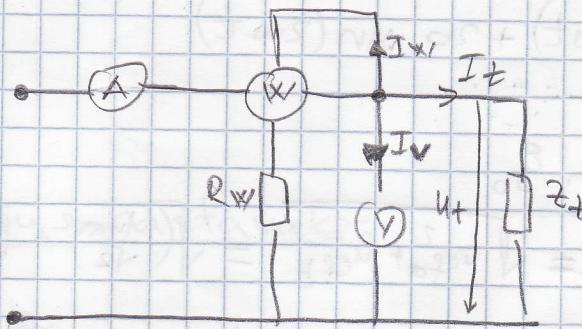
$$P = 74 \text{ kW}$$

$$U_V = 232 \text{ V}$$

$$I_A = 0,65 \text{ A}$$

$$L_V = 65 \text{ kJL}$$

$$R_V = 250 \text{ k} \Omega$$



$$P = U_t \cdot I_t \cdot \cos \varphi \Rightarrow \cos \varphi = \frac{P_t}{U_t \cdot I_t}$$

$$U_t = U_V$$

$$I_t = I_A - I_V - I_W$$

$$I_t = I_A - \frac{U_V}{R_V} - \frac{U_V}{R_W}$$

$$P_t = P_W - \left(\frac{U_V^2}{R_V} + \frac{U_V^2}{R_W} \right)$$

$$\cos \varphi = \frac{P_W - \left(\frac{U_V^2}{R_V} + \frac{U_V^2}{R_W} \right)}{U_V \cdot \left(I_A - \frac{U_V}{R_V} - \frac{U_V}{R_W} \right)}$$

$$= 0,487$$

S. Pr

$$u = 200 \sin(\omega t) + 20 \sin(2\omega t)$$

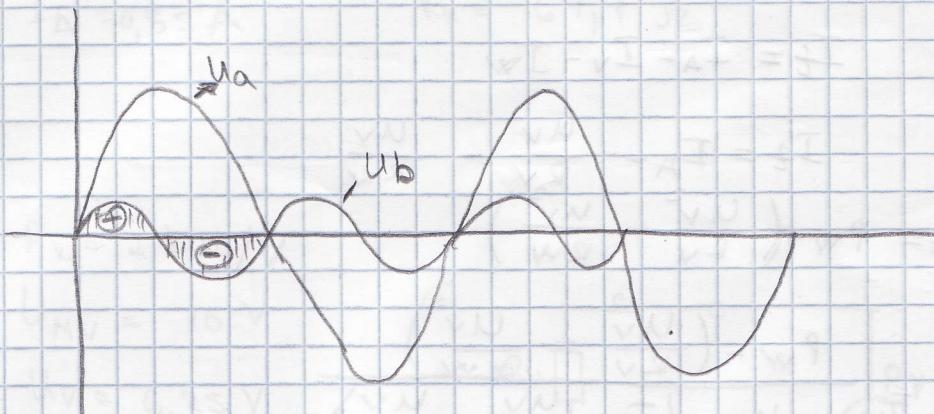
$$U_{V1} = U_{sr} \cdot \xi_0$$

$$U_{V2} = U_{eff} = \sqrt{U_{effa}^2 + U_{effb}^2} = \sqrt{\left(\frac{U_{max}}{\sqrt{2}}\right)^2 + \left(\frac{U_{mb}}{\sqrt{2}}\right)^2} =$$

$$U_{max} = 200 \text{ V}$$

$$U_{mb} = 20 \text{ V}$$

$$U_{V2} = 142,127 \text{ V}$$



$$U_{sr} = U_{sr,a} = \frac{2 U_{mb}}{\pi}$$

$$U_{V1} = U_{sr} \cdot \xi_0 = \frac{2 U_{mb}}{\pi} \cdot \xi_0 = 141,421 \text{ V}$$

$$\Delta u = |U_{V1} - U_{V2}| = 0,71 \text{ V}$$

6. Pr] Rijesen

7. Pr] Rijesen

Prijenj za vježbu - nastavak:

8. uverenje snage

9. $C = 1 \text{ nF}$

$$\operatorname{tg} \delta = 0,003$$

$$U = 150 \text{ V}$$

$$f = 1 \text{ kHz}$$

$$P = U^2 \cdot C \cdot \omega \cdot \delta = 0,42 \text{ mW}$$

10.) $U_V = E \frac{R_V}{R_U + R_V}$

1.) $I = 80 \text{ A}$

$$B = 1,1 \text{ T}$$

$$R_H = 400 \text{ cm}^3/\text{A s}$$

$$\delta = 1,5 \text{ mm}$$

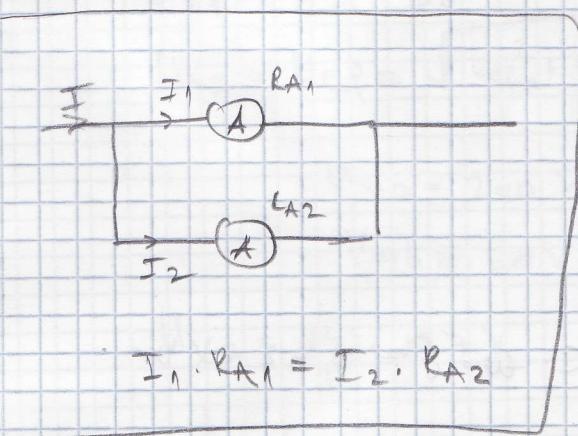
$$U_H = 50 \text{ mV}$$

$$I_H = ?$$

$$U_H = R_H \frac{B \cdot I_H}{\delta}$$

$$I_H = \frac{U_H \cdot \delta}{R_H \cdot B} = 170,4 \text{ mA}$$

12



$$I_1 \cdot R_{A1} = I_2 \cdot R_{A2}$$

I/k	0,5	1	1,5	2,0	2,5	3
I_2/A	0,52	1,01	1,47	2,05	2,53	2,97
$\Delta I/A$	-0,02	-0,01	0,03	-0,05	-0,03	0,03

$$(\Delta I = 0,08 A)$$

$$\frac{\Delta I}{I_{\text{MAX}}} = \frac{0,08}{3} = 0,017$$