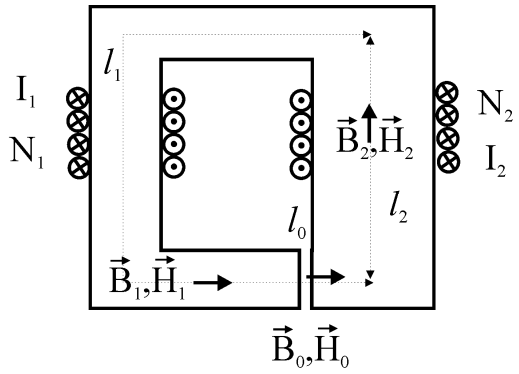
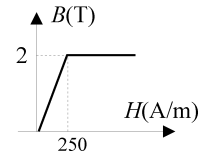
Rešenje ispita iz predmeta: Osnovi elektrotehnike 2

Odsek: Mehatronika 22. 09. 2007.

1 a = 1cm, b = 3cm, c = 2cm, l_0 = 1mm, N_1 = 200, N_2 = 300, I_2 = 1A, ($\mu_0 = 4\pi 10^{-7}$ H/m), B_0 = 1T





$$\mu = \frac{\Delta B}{\Delta H} = \frac{2}{250} H/m$$

$$l_1 = 3b + 2a + c = 13cm$$

$$l_2 = b + a = 4cm$$

1) $B_1 = B_0 = 1T$

2) $B_1 S_1 = B_2 S_2 \Rightarrow B_1 S_1$

3) $H_0 = \frac{B_0}{\mu_0} = 796{,}18\ kA/m$

4) $H_1 = \frac{B_1}{\mu} = 125A/m$

5) $H_2 = \frac{B_2}{\mu} = 62{,}5A/m$

6) $H_1 l_1 + H_0 l_0 + H_2 l_2 = N_1 I_1 + N_2 I_2$

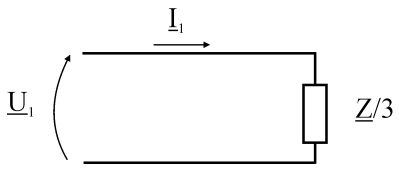
6) $16{,}25 + 796 + 2{,}5 = 200 I_1 + 300, \quad \Rightarrow I_1 = 2{,}57A$

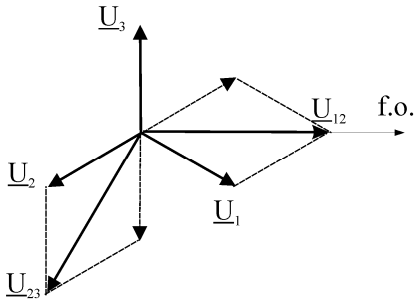
$$W_{mj} = \int \omega dv = \frac{1}{2} B_1 H_1 S_1 l_1 + \frac{1}{2} B_2 H_2 S_2 l_2 = 875\mu J$$

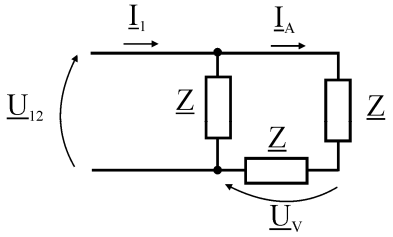
$$W_{m0} = \int \omega dv = \frac{1}{2} B_0 H_0 l_0 S_1 = 40mJ$$

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2. $\underline{Z}$=(90+j210)Ω, $u_{12}(t) = 380\sqrt{2}\cos(314t)V$







$$\underline{I}_1 = \frac{\underline{U}_1}{\underline{Z}/3} = \frac{220e^{-j30}V}{(30 + j70)} = 2{,}88e^{-j97}A$$

$$I_A = \frac{|\underline{I}_1|}{\sqrt{3}} = 1{,}66A$$

$$U_V = |\underline{U}_{23}| = 380V$$

$$P_W = \mathrm{Re}\left\{\underline{U}_{23} \cdot \underline{I}_1^*\right\} = 380 \cdot 2{,}88 \cdot \cos(-120 + 97)$$
$$= 1006W$$

$$I_A = \frac{|\underline{U}_{12}|}{2|\underline{Z}|} = \frac{380}{2 \cdot 228} = 0{,}833A$$

$$\underline{I}_{12} = \frac{\underline{U}_{12}}{2\underline{Z}/3} = \frac{380}{2 \cdot 228e^{j67}/3} = 2{,}5e^{-j67}A$$

$$U_V = |\underline{I}_A| \cdot |\underline{Z}| = 190V$$

$$P_W = \mathrm{Re}\left\{\underline{U}_{23} \cdot \underline{I}_{12}^*\right\} = 380 \cdot 2{,}5 \cdot \cos(-120 + 67)$$
$$= 569W$$