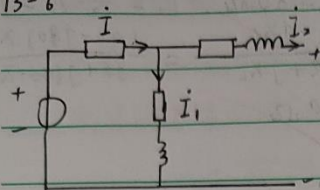


13-6



$$i_2 = 0, i = i_1$$

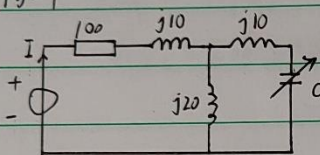
$$u_1 = j40i_1 + j30i_2 = j40i$$

$$u_2 = j30i_1 + j40i_2 = j30i$$

$$60\angle 0^\circ = 20i + 10i + j40i \Rightarrow i = \frac{6}{3+j4} \text{ A}$$

$$\therefore u_0 = -u_2 + u_1 + 10i = 16.97\angle -8.13^\circ \text{ V}$$

13-9



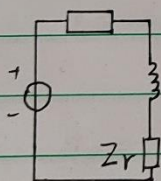
$$\frac{j20(j10 + X_C)}{j20 + j10 + X_C} = -j10 \Rightarrow X_C = \frac{1}{j\omega C} = \frac{500}{30j}$$

$$\therefore C = \frac{3}{500} \text{ F} = 6 \text{ mF}$$

$$i = \frac{u_s}{100} = \cos 10t \text{ A}$$

13-13

(1)



$$Z_r = \frac{(\omega M)^2}{z + j\omega L_2} = \frac{6^2}{10 + j10} = 1.8 - 1.8j (\Omega)$$

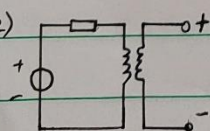
$$i_1 = \frac{u_s}{j10 + 10 + Z_r} = \frac{100\angle 0^\circ}{20 + j14.37\angle -34.8^\circ} = 6.96\angle -34.8^\circ$$

$$j10i_2 + j6i_1 + 10i_2 = 0 \Rightarrow i_2 = 2.95\angle -169.8^\circ \text{ A}$$

$$i_1 = 6.96 \cos(10^4 t - 34.8^\circ) \text{ A}$$

$$i_2 = 2.95 \cos(10^4 t - 169.8^\circ) \text{ A}$$

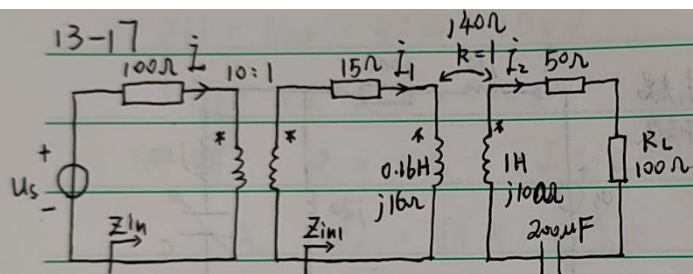
(2)



$$u_{oc} = j10 \times 0 - j6i_1 = -j6 \times \frac{u_s}{10 + j10} = -30 - j30 \text{ (V)}$$

$$Z_{eq} = j10 + \frac{6^2}{10 + j10} = \left(\frac{9}{5} + j\frac{41}{5}\right) \Omega$$

$$\text{当 } Z = Z_{eq}^* \text{ 时, 有 } P_{max} = \frac{1}{2} \times \frac{u_{oc}^2}{4 \times \frac{9}{5}} = 125 \text{ W}$$



$$Z_{in1} = 15 + j16 + \frac{40^2}{150 + j100 - j50} = \frac{123 + j64}{5} \Omega$$

$$Z_{in} = 100 + Z_{in1} \times 10^2 = (2560 + j1280) \Omega$$

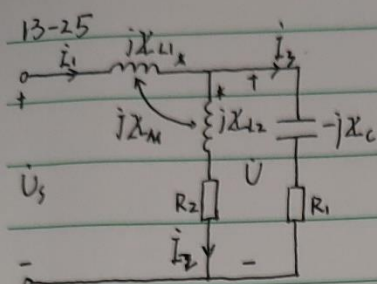
$$\dot{I} = \frac{\dot{U}_s}{Z_{in}} = \frac{5}{16 + j8} \text{ A}$$

$$\dot{I}_1 = 10\dot{I} = \frac{25}{8 + j4} \text{ A}$$

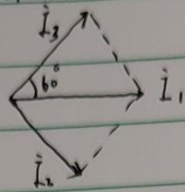
右边  $(j100\dot{I}_2 - j40\dot{I}_1) + 150\dot{I}_2 - j50\dot{I}_2 = 0$

$$\Rightarrow \dot{I}_2 = \frac{1+j}{2} \text{ A}$$

$$P_L = 100 \dot{I}_2^2 = 50 \text{ W}$$



由  $I_1 = I_2 = I$ ,  $\dot{I}_1 = \dot{I}_2 + \dot{I}_3$



可令  $\dot{I}_1 = I \angle 0^\circ$

$\dot{I}_2 = I \angle -60^\circ$

$\dot{I}_3 = I \angle 60^\circ$

有  $RI^2 + \frac{R}{2}I^2 = 60$

$(R - jX_c) \times I \angle 60^\circ = 40 \angle 0^\circ$

$(R + jX_m - jX_c) \times I \angle 60^\circ = (\frac{R}{2} + jX_{L2} - jX_m) \times I \angle 60^\circ$

$\Rightarrow R = 10 \Omega, X_c = 10\sqrt{3} \Omega, I = 2 \text{ A}$

$X_m = \frac{10\sqrt{3}}{3} \Omega$

$X_{L2} = \frac{35\sqrt{3}}{3} \Omega$

A+