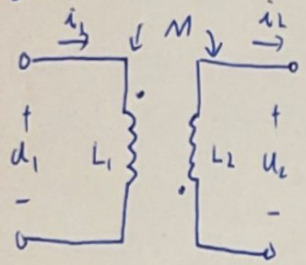
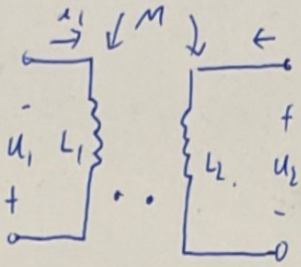
6-4.



$u_1 = L_1\frac{di_1}{dt} + M\frac{di_2}{dt}$

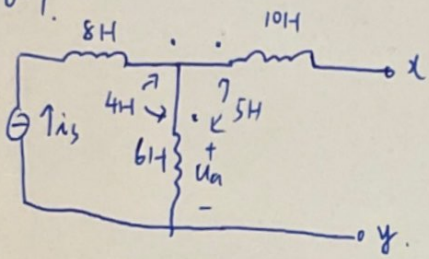
$u_2 = -L_2\frac{di_2}{dt} - M\frac{di_1}{dt}$.



$u_1 = -L_1\frac{di_1}{dt} - M\frac{di_2}{dt}$

$u_2 = L_2\frac{di_2}{dt} + M\frac{di_1}{dt}$.

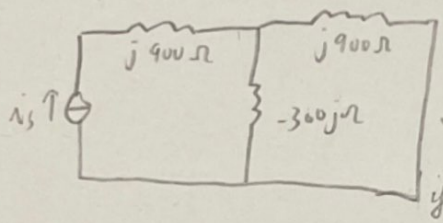
6-7.



(a) $\dot{u}_a = (j600 - j400)\dot{I}_s = 200\sqrt{2}\angle 90°\,V$.

$\therefore u_a = 400\sin(100t + 90°)\,V$.

(b) 等效去耦电路为



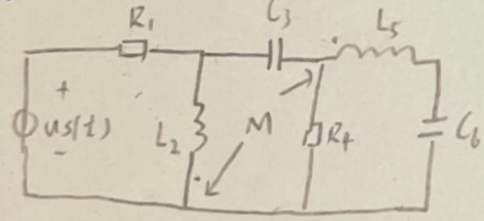
$\dot{i}_s = \frac{-300j}{600j}\dot{i}_s = -\frac{1}{\sqrt{2}}\angle 0°\,A$.

$\dot{u}_a = -400j\,\dot{i}_s + 500j\,\dot{i} + 600j(\dot{i}_s - \dot{i})$

$= 250\sqrt{2}\angle 90°\,V$

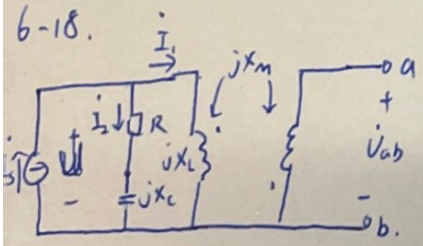
$\therefore u_a = 500\sin(100t + 90°)\,V$.

6-11



$$\begin{cases} (R_1 + jwL_2)\dot{I}_1 - jwL_2\dot{I}_2 - jwM\dot{I}_3 = \dot{u}_s \\ -jwL_2\dot{I}_1 + (jwL_2 + \frac{1}{jwC_3} + R_4)\dot{I}_2 + (jwM - R_4)\dot{I}_3 = 0 \\ -R_4\dot{I}_2 + (R_4 + jwL_5 + \frac{1}{jwC_6})\dot{I}_3 + jwM(\dot{I}_2 - \dot{I}_1) = 0 \end{cases}$$

6-18.

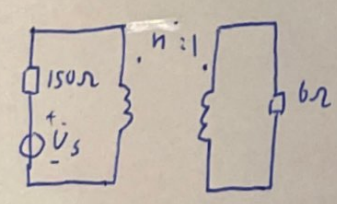


$$\begin{cases} \dot{u}_{ab} = -jwX_m\dot{I}_1 \\ \dot{u} = jwX_L\dot{I}_1 \end{cases} \Rightarrow \dot{u} = 10\angle 180°\,V.$$

$\dot{u} = \dot{I}_2(R + jX_C) \Rightarrow \dot{I}_2 = 2.24\angle -153°\,A$.

$\dot{u}_{ac} = \dot{u}_{ab} - \dot{I}_2 jX_C = 7.21\angle -33.7\,V$.

6-14.



$Z_{eq} = 6n^2\,\Omega$.

当 $6n^2 = 150\,\Omega$，即 $n = 5$ 时，有 $P_{max}$

$P_{max} = \frac{U_s^2}{4R} = 0.167\,W$.