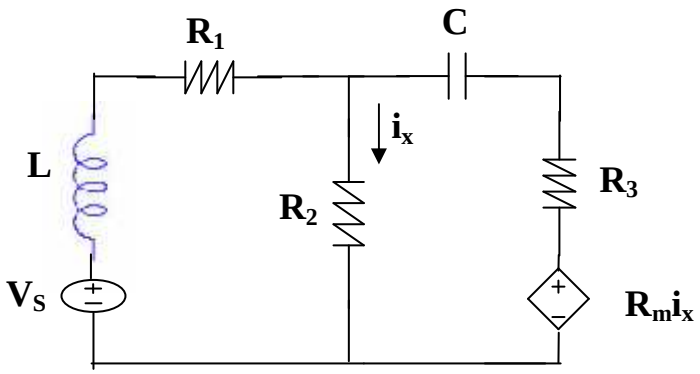
EE 202
Middle East Technical University

Homework #1
(Due: March 6, 2008)

Problem 1

For the circuit shown below, write the node and modified node equations. Assume $I_L(0) = I_0$ and $V_C(0) = V_0$.



Problem 2 (Chua, Pr. 12.6)

For the circuit shown below, find node equations. Assume $I_{L1}(0) = I_1$, $I_{L2}(0) = I_2$ and $V_C(0) = V_0$.

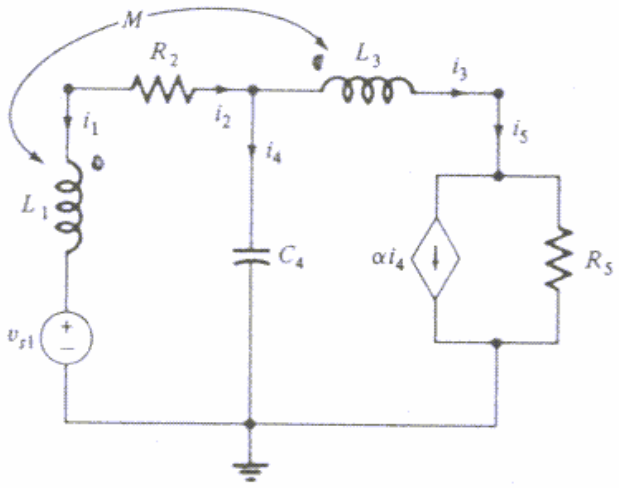


Figure P12.6

Problem 3 (Chua, Pr. 12.12)

The circuit given below contains a mutual inductor with the following defining equation.

$$\begin{bmatrix} V_{L_1} \\ V_{L_2} \\ V_{L_3} \end{bmatrix} = \begin{bmatrix} 4 & 2 & 1 \\ 2 & 4 & 2 \\ 1 & 2 & 4 \end{bmatrix} \frac{d}{dt} \begin{bmatrix} i_1 \\ i_2 \\ i_3 \end{bmatrix}$$

The reference directions for i_1, i_2 and i_3 are given on the circuit diagram. The other components are $C_1 = 0.5$ F, $C_2 = 0.25$ F, $g_m = 2$, $R_1 = 1\ \Omega$, $R_1 = 2\ \Omega$.

Write mesh equations. Assume zero initial conditions.

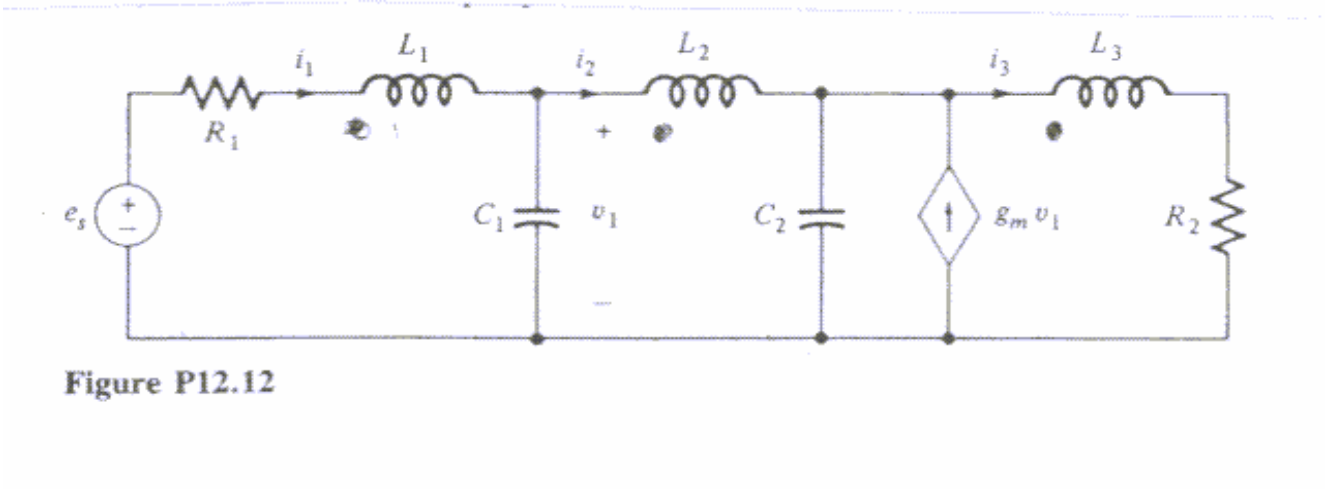


Figure P12.12