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Quiz #20 MAE 3319 November 27, 2007

Name

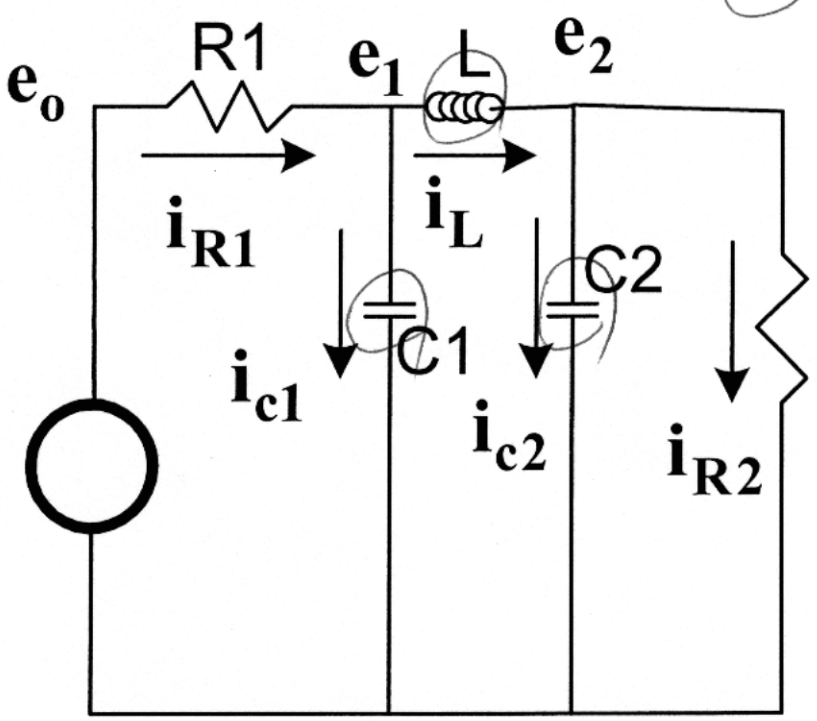
The input to the electrical circuit shown below is voltage $\mathbf{e_o}$. As a reminder, the impedance equations are

$$\mathbf{i = \frac{\delta e}{R}}$$

$$\mathbf{i = \frac{\delta e}{LD}}$$

$$\mathbf{i = CD\delta e}$$

To write state variable equations for this circuit, state variables must first be assigned. Assign the state variables for this system.



$x_1 = i_L = \frac{e_1 - e_2}{LD}$

$x_2 = e$

$x_1 = e_1$; voltage at C1

$x_2 = e_2$; " C2

$x_3 = i_L$; current at L

$i_{R_1} = \frac{e_o - e_1}{R_1}$ $\quad i_{R_2} = \frac{e_2}{R}$

$i_{C_1} = C_1 D \cdot (e_1 - 0)$ $\quad i_{C_2} = C_2 D (e_2)$

$i_L = \frac{e_1 - e_2}{LD}$