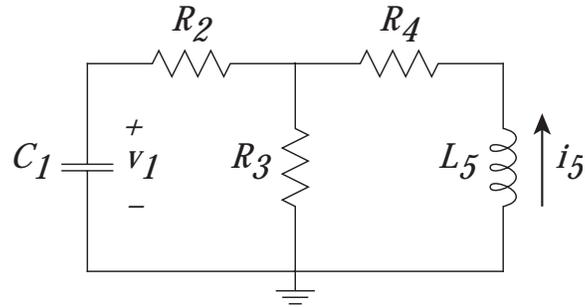


Problem S11 (Signals and Systems)



Consider the circuit of Problem S10 above, with

$$C_1 = 0.5 \text{ F}, \quad R_2 = 4 \, \Omega, \quad R_3 = 4 \, \Omega, \quad R_4 = 1 \, \Omega, \quad L_5 = 2 \text{ H}$$

Find the state-space equations that describe the evolution of the circuit, in the form

$$\frac{d}{dt} \underline{x}(t) = A \underline{x}(t)$$

where

$$\underline{x}(t) = \begin{bmatrix} v_1(t) \\ i_5(t) \end{bmatrix}$$