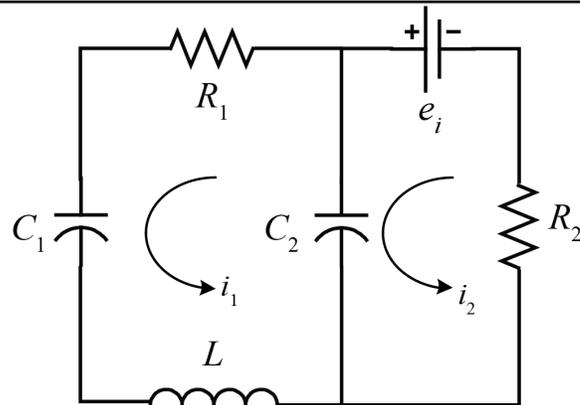


Quiz #4
ENGR 4220/5220: Control Systems
Professor Hill
University of Detroit Mercy, Summer 2013



1. In the circuit shown, define $i_1 = \dot{q}_1$ and $i_2 = \dot{q}_2$, where q_1 and $q_2 - q_1$ are the charges in the capacitors C_1 and C_2 , respectively. Write the equation(s) governing the behavior of the given circuit.

2. Rewrite your equations from Part 1 in state-space matrix form by letting i_1 be the output and choosing the state variables x_1 , x_2 , and x_3 as follows:

$$x_1 = q_1$$

$$x_2 = \dot{q}_1$$

$$x_3 = q_2$$