

Question 1

For the circuit shown in Fig. 1, all the elements have unit values and the initial conditions are $i_2(0^-) = i_4(0^-) = v_1(0^-) = v_3(0^-) = 1$ and $i_5(0^-) = 0$.

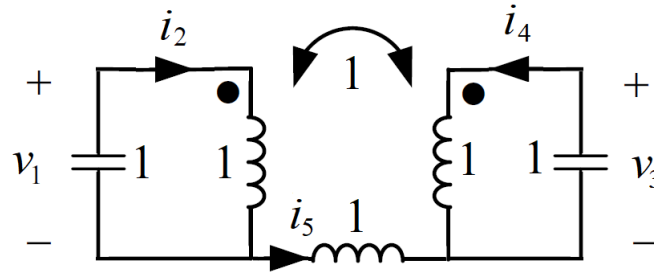


Figure 1: A coupled LTI circuit.

(a) Find the state equations.

(b) Solve the state equation.

(c) Find the natural frequencies of $i_5(t)$.

(d) Find the natural frequencies of the circuit.