Assignment 8
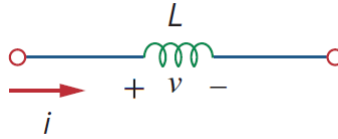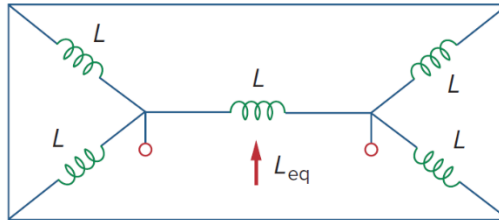
1. The voltage across a 50 mH inductor is given by
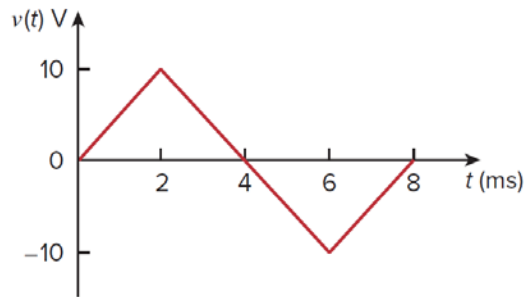

$$v(t) = (5e^{-2t} + 2t + 4)\ V\ for\ t > 0.$$

Determine the current $i(t)$ through the inductor. Assume that $i(0) = 0\ A$.

2. Find L_{eq} in each of the following circuit.

3. The voltage across a $4\ \mu F$ capacitor is shown in the following figure. Find the current waveform. (Assume the current passing through the capacitor is along the voltage drop on it.)

4. Find C_{eq} in the circuit shown below if all capacitors are $4\ \mu F$. (Note: around the sulotion to 2 decimal places)
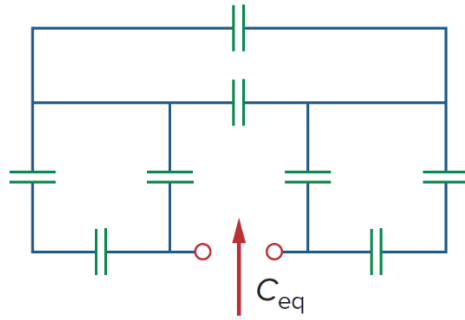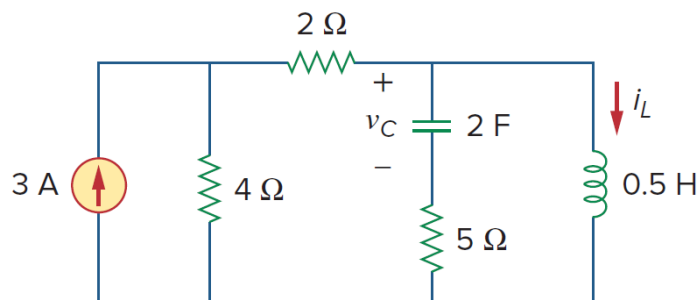
5. Find the voltages across the capacitors in the circuitbelow under dc conditions. (Hints: When capacitors are fully charged, the voltages across the capacitors are constant)
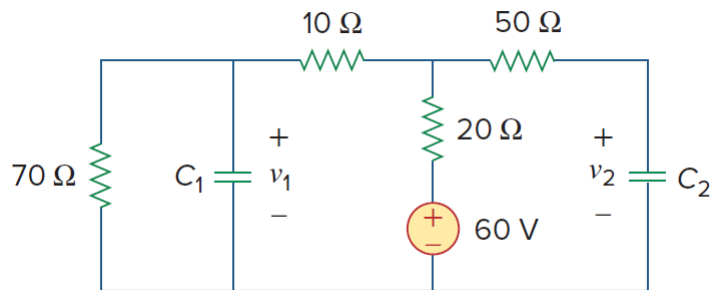
Answers: $v_1 = 42\ V, v_2 = 48\ V$

6. Find v_C, i_L, and energy stored in the capacitor and inductor in the following circuit under dc conditions. (Hint: 1. When capacitors are fully charged, the voltages across the capacitors are constant. 2. When inductors have been driven by dc sources for a long time, the currents in the inductors are constant).

Answers: $v_C = 0,\ i_L = 2\ A, w_c = 0\ J, w_l = 1\ J$