# Homework 8 on Lectures on Power Electronics and *EV* Charger Design

Date due: **April 14, 2023**

1.   **Identify** a similarity and a difference between levels 1 and 2 chargers.

2.   The circuit below depicts a Zeta converter. Recall that for the periodic steady-state conditions, the following relations hold: $<v_L> = 0$ and $<i_C> = 0$. Note also that Kirchhoff's voltage law applies for the average conditions equally well. **Determine** $<V_t>$, the average of the voltage across the capacitor C_t.
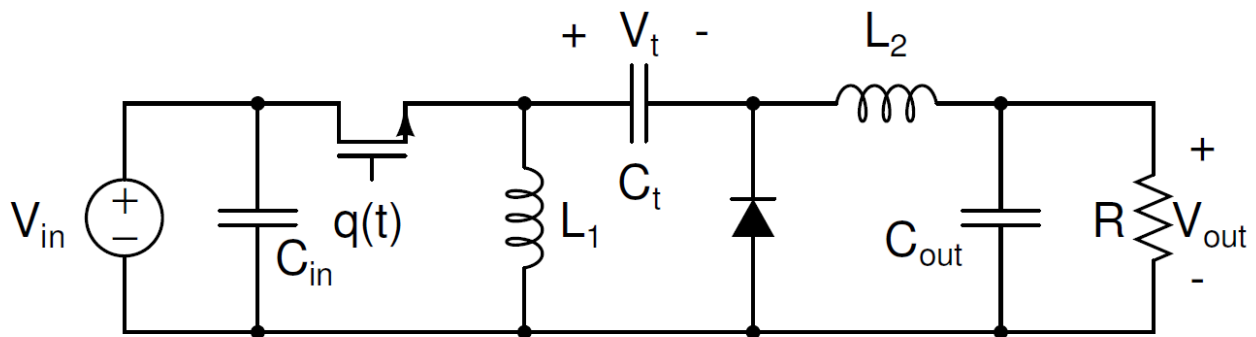
3.   Consider an energy buffer for a 6-*kW*, level 2 onboard charger. The battery has a 400-*V* nominal voltage. The distribution grid operates at a frequency of 60 *Hz* and a peak voltage ripple of 8 *V*. **Determine** how large of a capacitor is needed to buffer the twice line-frequency power.