

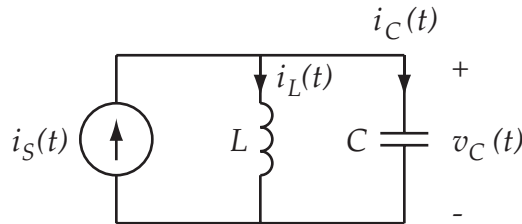
Inter American University of Puerto Rico
Bayamón Campus
School of Engineering
Department of Electrical Engineering

ELEN 3301 – Electric Circuits I

Problem Set 7

Due Wednesday, October 20

Problem 1: For the circuit below, $v_C(0) = 0$ and $i_L(0) = 0$.



- (A) Let $i_S(t) = I_S u(t)$. Find an algebraic expression and sketch $i_L(t)$ for $-\pi\sqrt{LC} < t < 2\pi\sqrt{LC}$.
- (B) Let $i_S(t) = I_S u(t)$. Find an algebraic expression and sketch $i_C(t)$ for $-\pi\sqrt{LC} < t < 2\pi\sqrt{LC}$.
Hint: Use KCL and the expression for $i_L(t)$ found in part (A).
- (C) Let $i_S(t) = I_S u(t)$. Find an algebraic expression and sketch $v_C(t)$ for $-\pi\sqrt{LC} < t < 2\pi\sqrt{LC}$.
Hint: Use KVL and the expression for $i_L(t)$ found in part (A).
- (D) Let $i_S(t) = Q\delta(t)$. Repeat parts (A), (B) and (C) using this new input. Remember to sketch all three responses.

Problem 2: For the circuit below, $v_C(0) = 0$ and $i_L(0) = 0$. If $v_S(t)$ is as shown in the figure below, find an algebraic expression and sketch $v_C(t)$ for $-\pi\sqrt{LC} < t < 3\pi\sqrt{LC}$.

