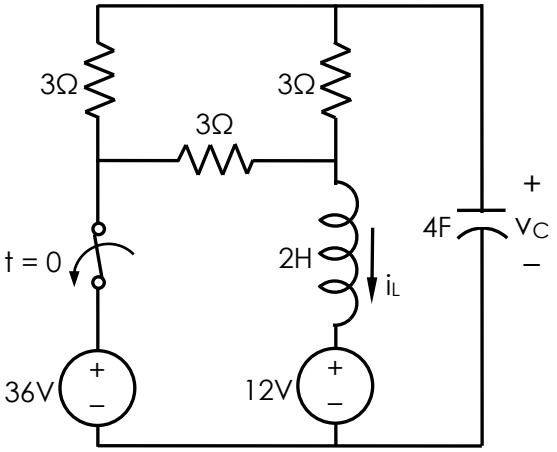
EEE 33 1st Semester AY 2011-2012: Homework 4

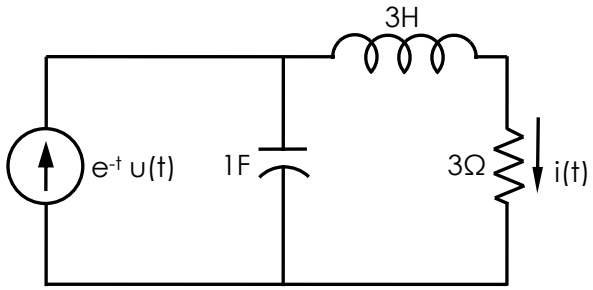
Problem 1: Evaluating Initial Conditions

Solve for i_L, i_L', v_C, and v_C' at $t=0^+$.



Problem 2: The Steady-State Response

Find the steady-state response of i(t)for t>0.

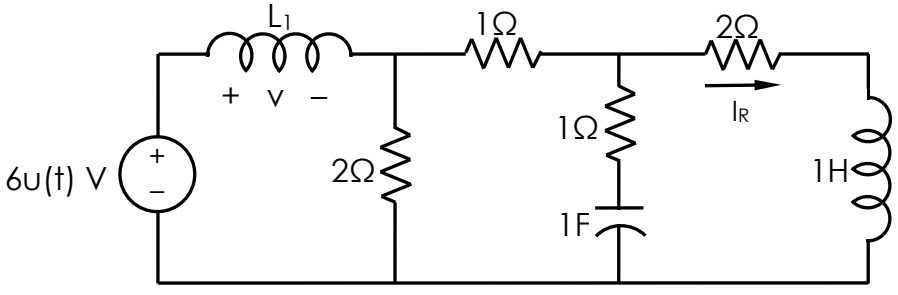


Problem 3: Solving the Differential Equation

The voltage across the inductor L_1 is given by:

$$\frac{d^3v}{dt^3}+4\frac{d^2v}{dt^2}+5\frac{dv}{dt}+2v=0$$

Find $i_R(t)$ for $t > 0$ if $i_R(0^+)=0$, $i_R'(0^+)=0$, and $i_R''(0^+)=-2$ A/s^2.



Problem 4: Second-Order Transients

1. Formulate the state equations describing the circuit for t > 0.
2. Solve for $i_L(0^+)$, $v_C(0^+)$, $i_L'(0^+)$, and $v_C'(0^+)$.
3. Solve for $v_C(t)$ for t > 0.
4. Solve for $i_R(t)$ at t = 0.2s.