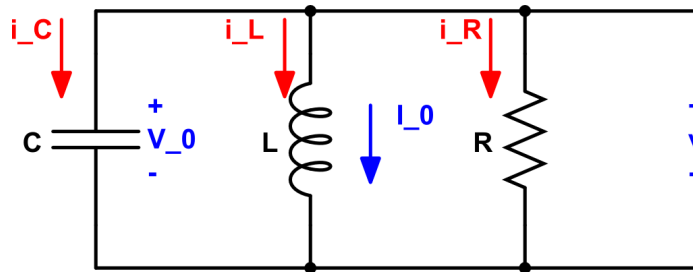


Question 1 [5]

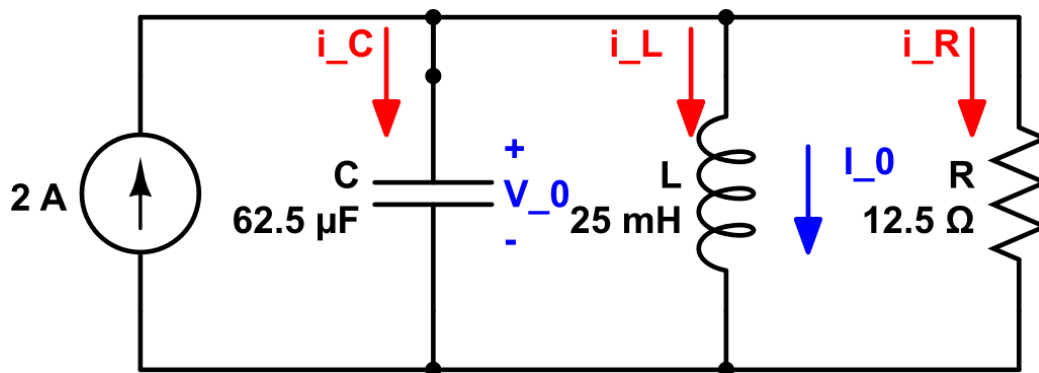
For the circuit below, $R = 200\Omega$, $L = 50mH$, $C = 0.2\mu F$. The initial inductor current is $-45mA$ and the initial capacitor voltage is $15V$.



- Calculate the initial current for each branch of the circuit.
- Find $v(t)$ for $t \geq 0$.
- Find $i_L(t)$ for $t \geq 0$.

Question 2 [5]

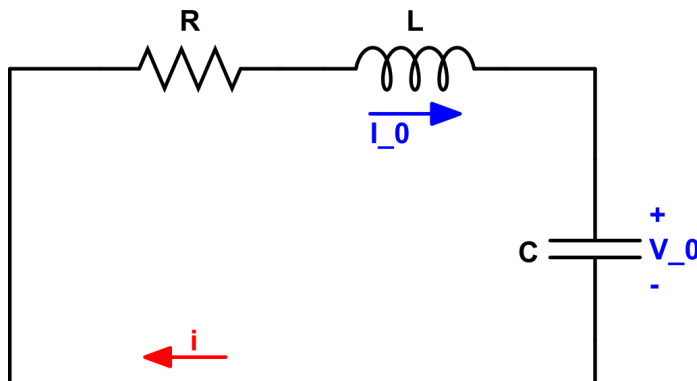
For the circuit below with $R = 12.5\Omega$, $L = 25mH$, $C = 62.5\mu F$. Assume that at the instant that the $2A$ current source is applied to the circuit, the initial inductor current is $1A$ and that the initial capacitor voltage is $50V$. Find the expression for $i_L(t)$ for $t \geq 0$.



Question 3 [5]

The current in the circuit below is known to be

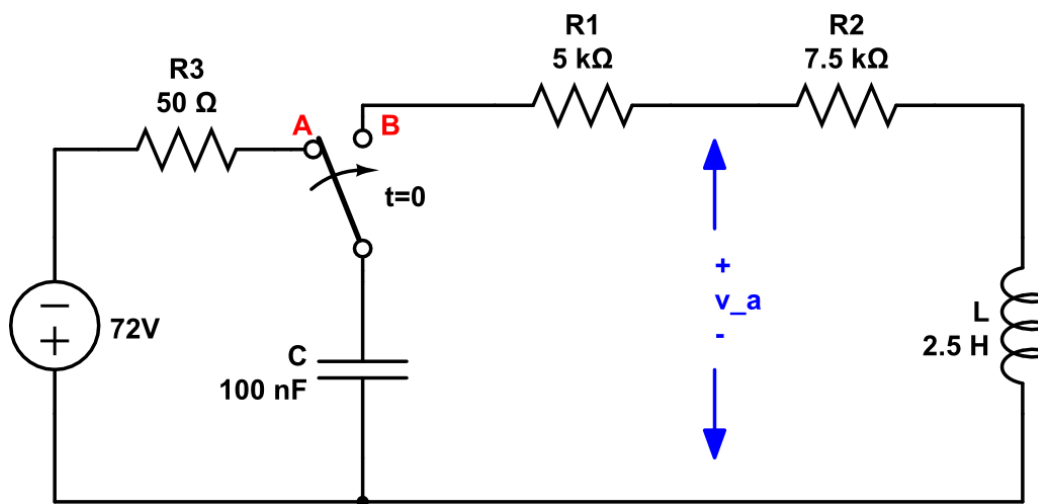
$$i(t) = B_1 e^{-2000t} \cos(1500t) + B_2 e^{-2000t} \sin(1500t), t \geq 0 \quad (1)$$



The capacitor has a value of 80 nF , the initial current is 7.5 mA , and the initial voltage across the capacitor is -30 V . Find R, L, B_1, B_2 .

Question 4 [5]

The switch in the circuit below has been at Position A for a long time. At $t = 0$, the switch is moved instantaneously to Position B.



- (a) What is the initial value for v_a ?
- (b) What is the initial value for $\frac{dv_a}{dt}$?
- (c) What is the numerical expression for $v_a(t)$ for $t \geq 0$.