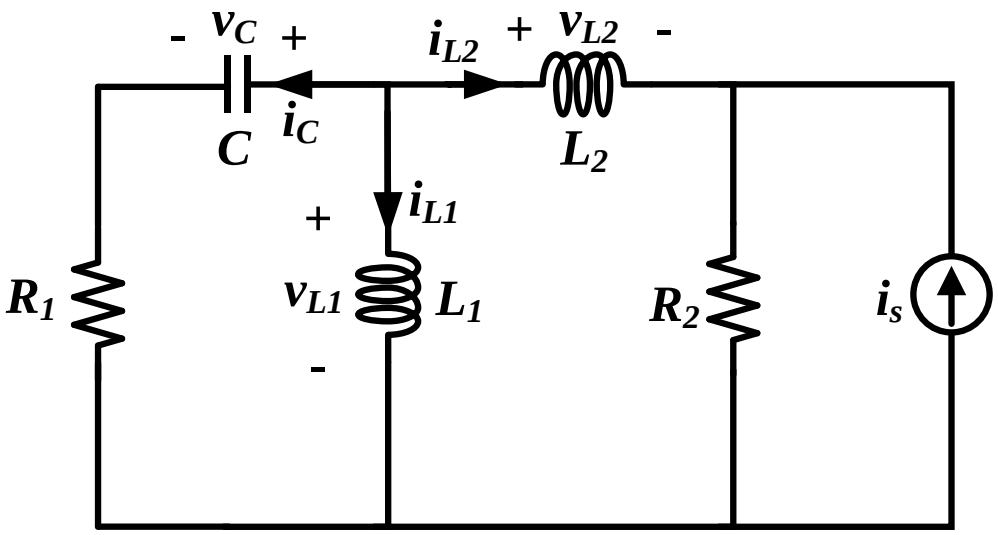
電路學(EE2210)第九次隨堂考

2015年12月02日
時間：10分鐘
Close Book

學號：_____

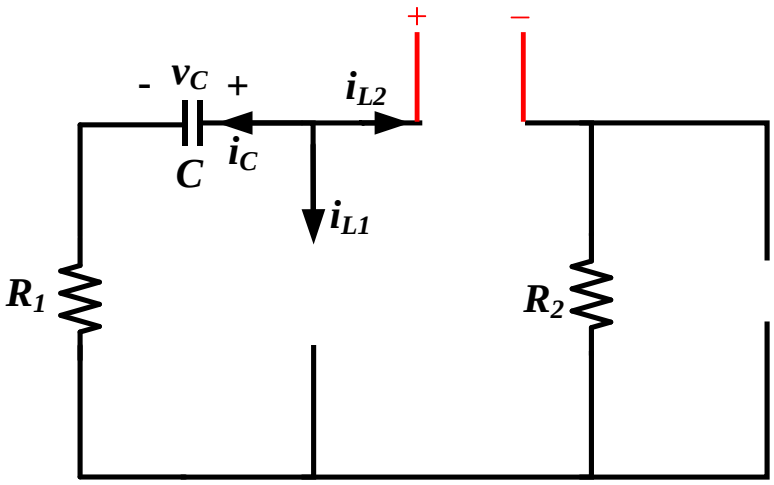
姓名：_____

By using superposition, find the state equation of inductance L_2 for the circuit as shown.



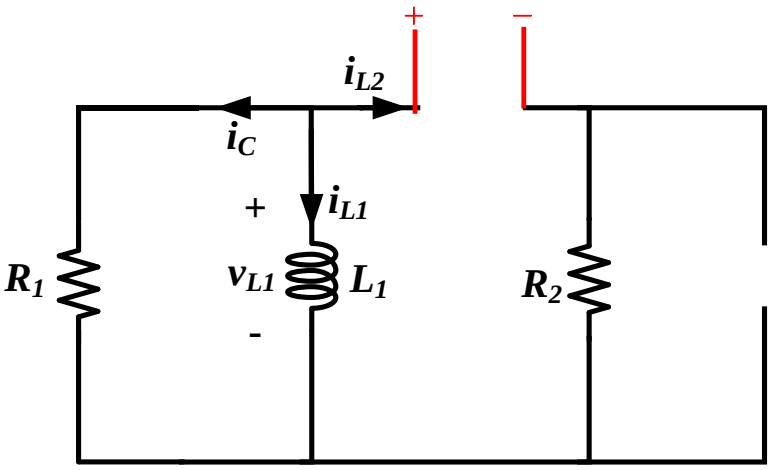
This circuit we replace the capacitor by a voltage source and inductor by a current source.

(i) Using superposition for capacitance C :



$v_{L2} = v_C$

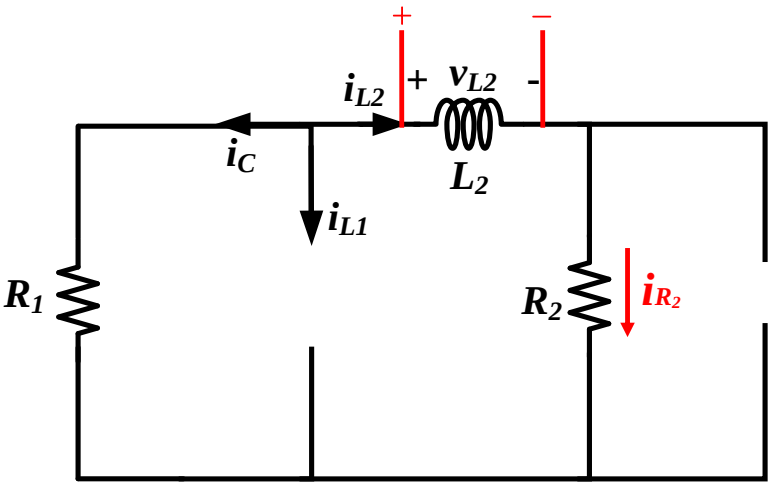
(ii) Using superposition for inductance L_1 :



$i_C = -i_{L1}$

$v_{L2} = -i_{L1}R_1$

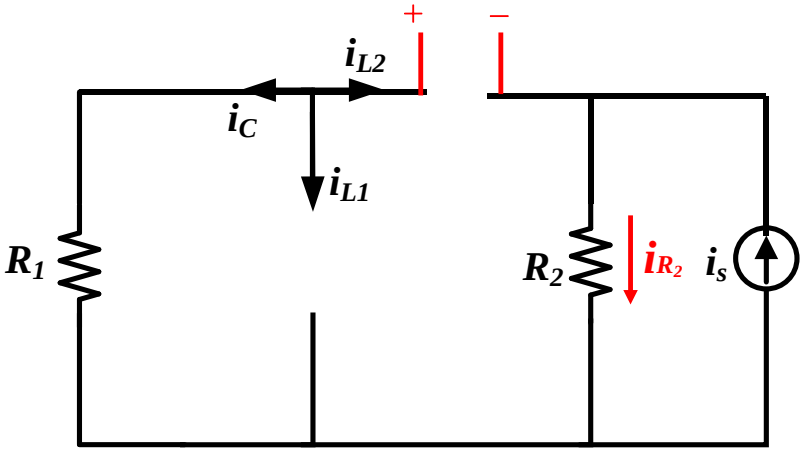
(iii) Using superposition for inductance L_2 :



$i_{R_2} = i_{L2}$

$v_{L2} = -i_{L2}(R_1 + R_2)$

(iv) Using superposition for inductance i_S :



$i_{R_2} = i_S$

$v_{L2} = -i_S R_2$

(v) $$v_{L2} = L_2 \frac{di_{L2}}{dt} = v_c - i_{L1}R_1 - i_{L2}(R_1 + R_2) - i_s R_2$$

	v_C	i_{L1}	i_{L2}	i_S
$v_{L2} = L_2 \frac{di_{L2}}{dt}$	1	$-R_1$	$-(R_1 + R_2)$	$-R_2$

$$v_{L2} = L_2 \frac{di_{L2}}{dt} = \underline{v_c - i_{L1}R_1 - i_{L2}(R_1 + R_2) - i_s R_2}$$