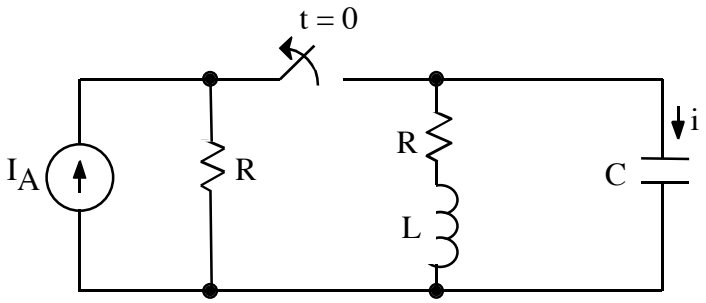
1.

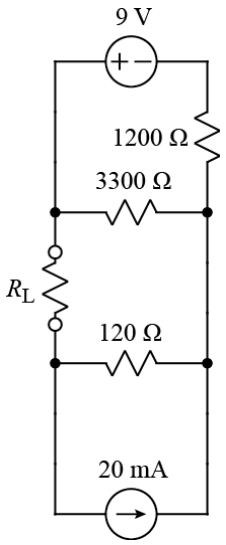


$I_A = 1$ A
R = 2400 Ω
L = 200 μH
C = 50 pF

a) After being closed for a long time, the switch is opened at t = 0. Give the values of the characteristic roots for the circuit and state whether i(t) is underdamped, overdamped, or critically damped.

b) Write a numerical time-domain expression for i(t), the current through the capacitance. This expression must not contain any complex numbers.

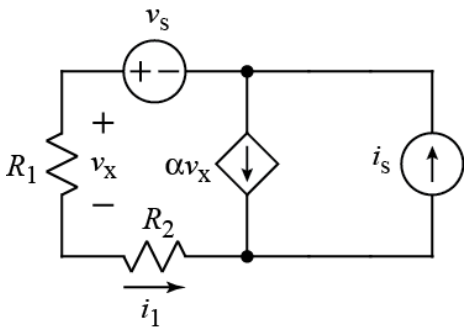
2.



a) Calculate the value of R_L that would absorb maximum power.

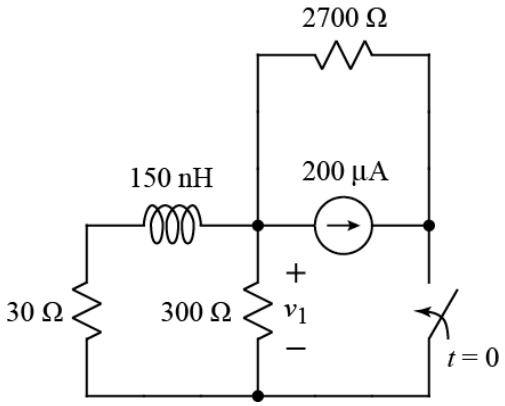
b) Calculate that value of maximum power R_L could absorb.

3.



Using superposition, derive an expression for i_1 that contains no circuit quantities other than i_s, v_s, R_1, R_2, and α. Note: $\alpha > 0$.

4.



After being open for a long time, the switch closes at $t = 0$.

a) Calculate the energy stored on the inductor as $t \to \infty$.

b) Write a numerical expression for $v_1(t)$ for $t > 0$.