1. 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.
1. Using superposition, derive an expression for $i_1$ that contains no circuit quantities other than $i_s$, $v_s$, $R_1$, $R_2$, and $\alpha$. 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 $t > 0$. 

![Circuit Diagram]