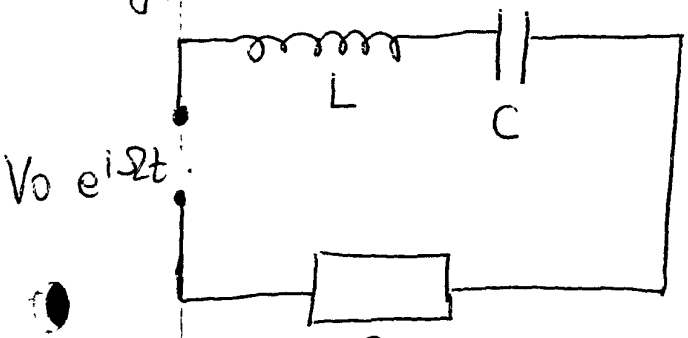
Problem 2

The figure below shows an electrical circuit in which simple harmonic oscillations take place.

(a) Compute the time dependent current $I = I(t)$, that flows through the circuit.



(b) For which value of Ω is the circuit at resonance?

Hint: Make an ansatz: $I(t) = I_0 e^{i(\Omega t - \varphi)}$

and compute the values for I_0 and φ.

Solution:

The differential eqn. describing the circuit takes the form:

$$L\ddot{q} + R\dot{q} + \frac{1}{C}q = V_0 e^{i\Omega t}.$$