RLC Circuit: Application (3)

In the circuit shown the capacitor is without charge and the switch is in position a.

(i) When the switch is moved to position b we have an RC circuit with the capacitor being charged up gradually: $Q(t) = \mathcal{E}C[1 - e^{-t/\tau}]$.

Find the time constant τ and the charge Q_{max} after a long time.

(ii) Then we reset the clock and move the switch from b to c.

We now have a an LC circuit: $Q(t) = Q_{max}\cos(\omega t)$.

Find the angular frequency of oscillation ω and the maximum current I_{max} that flows through the inductor periodically.