AC Circuit Application (6)

Consider an RLC series circuit with inductance $L = 88m$H, capacitance $C = 0.94\mu$F, and unknown resistance R.

The ac generator $\mathcal{E} = \mathcal{E}_{max}\sin(\omega t)$ has amplitude $\mathcal{E}_{max} = 24$V
and frequency $f = 930$Hz. The phase angle is $\delta = 75^\circ$.

(a) Find the resistance R.

(b) Find the current amplitude I_{max}.

(c) Find the maximum energy U_L^{max} stored in the inductor.

(d) Find the maximum energy U_C^{max} stored in the capacitor.

(e) Find the time t_1 at which the current has its maximum value I_{max}.

(f) Find the time t_2 at which the charge on the capacitor has its maximum value Q_{max}.