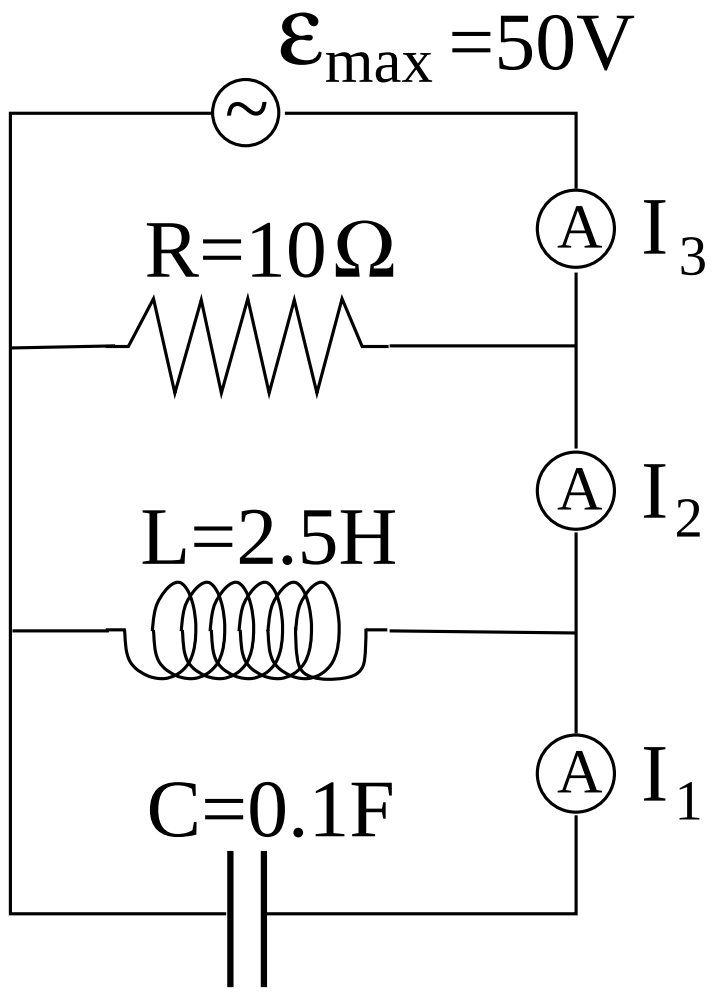
AC Circuit Application (3)

Find the current amplitudes I_1, I_2, I_3

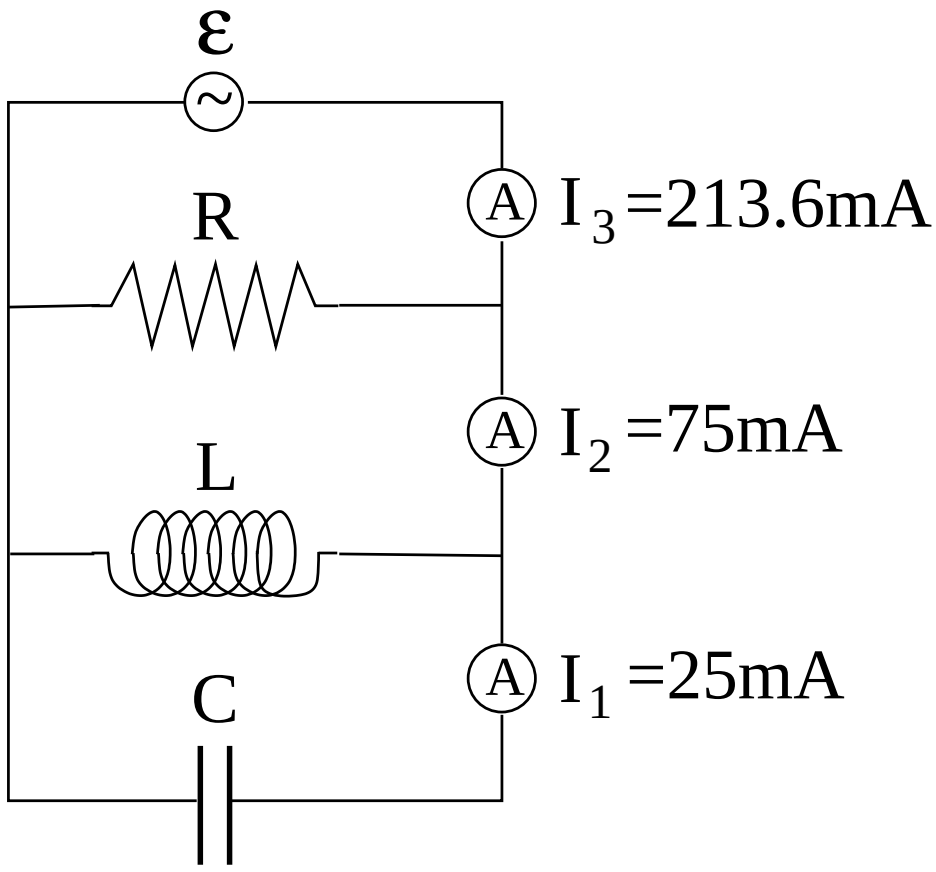
(a) for angular frequency $\omega = 2$rad/s,

(b) for angular frequency $\omega = 4$rad/s.



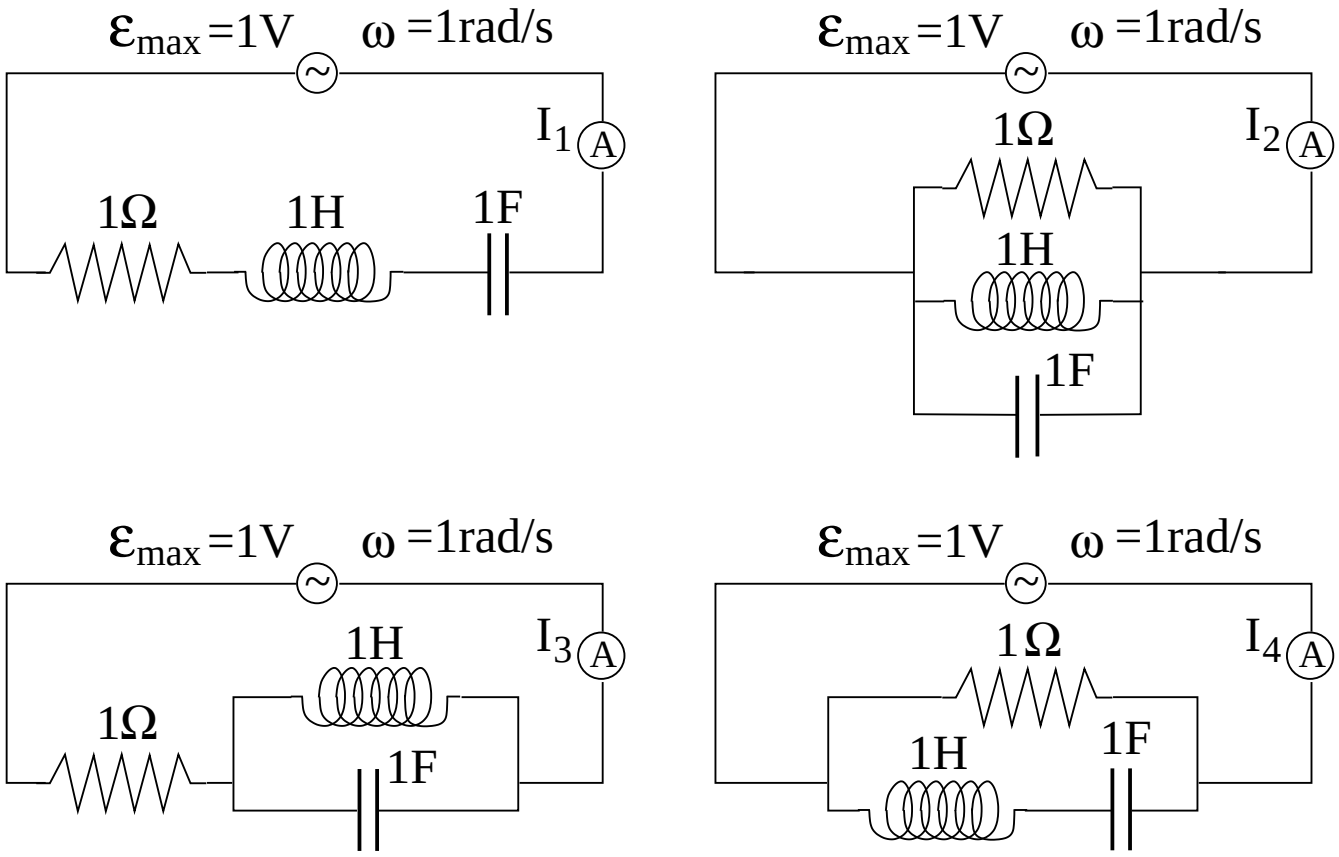
AC Circuit Application (4)

Given the current amplitudes I_1, I_2, I_3 through the three branches of this RLC circuit, and given the amplitude $\mathcal{E}_{max} = 100$V and angular frequency $\omega = 500$rad/s of the ac source, find the device properties R, L, C.



AC Circuit Application (5)

Find the current amplitudes I_1, I_2, I_3, I_4 in the four RLC circuits shown.



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 $\delta = 75°$.

(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}.