Analog Assignment
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PROBLEM STATEMENT(12.7 7th question) :A charged 30 µF capacitor is connected to a 27 mH inductor. What is the angular frequency of free oscillations of the circuit?

ANSWER:

The angular frequency (ω) of free oscillations in an RLC circuit is given by:

$$\omega = \frac{1}{\sqrt{LC}}$$

Given an inductance of $L = 27 \times 10^{-3}$ H and a capacitance of $C = 30 \times 10^{-6}$ F, substitute these values into the formula to find ω:

$$\omega = \frac{1}{\sqrt{(27 \times 10^{-3}) \times (30 \times 10^{-6})}}$$

Simplifying this expression gives:

$$\omega \approx \frac{1}{\sqrt{810 \times 10^{-9}}} \approx \frac{1}{\sqrt{0.81}} \approx \frac{1}{0.9} \approx 1.11$$

Therefore, the angular frequency (ω) is approximately 1.11 radians per second.