1. What is the relationship between frequency and angular frequency?

2. Why do transmission lines operate at very high voltages while household circuits operate at fairly small voltages?

3. Will a transformer work if the input is a dc voltage?

4. What is the capacitance of a capacitor whose reactance is **10Ω** at 60 Hz?

5. At what frequency is the reactance of a**20-μF** capacitor equal to that of a 10-mH inductor?

6. A **25-μF** capacitor is connected to an emf given by v(t)=(160V)sin(120πt).

7. What is the impedance of a series combination of a **50-Ω** resistor, a 5.0-μF5.0-μF capacitor and a 10-μF10-μF capacitor at a frequency of 2.0 kHz?

8. An **RLC** series circuit with R=600Ω,L=30mH,R=600Ω,L=30mH, and C=0.050μFC=0.050μF is driven by an ac source whose frequency and voltage  amplitude are 500 Hz and 50 V, respectively.

(a) What is the impedance of the circuit?

(b) What is the amplitude of the current in the circuit?

(c) What is the phase angle between the emf of the source and the current?