

PHYS 212 Homework Assignment

Chapter 15

Problem 1 An ac generator has an emf of $\mathcal{E} = \mathcal{E}_m \sin(\omega_d t)$ with $\mathcal{E}_m = 25.0$ V, $\omega_d = 377$ rad/s. The generator is connected to a 12.7 H inductor.

- (a) What is the maximum current in the circuit?
- (b) What is the emf of the generator when the current is at its maximum?
- (c) When the emf of generator is -12.5 V and increasing in value, what is the current?

Problem 2 A coil of 88 mH, a capacitor of $0.94 \mu\text{F}$ and an unknown resistor are placed in series with an alternating emf with frequency 930 Hz. The phase constant between the applied voltage and the current is 75° . What is the resistance in the circuit?

Problem 3 If you construct an RLC circuit with *two* of each component, all in series, what is the resulting impedance? The values of the components are R_1 , R_2 , C_1 , C_2 , L_1 and L_2 .