1. A charged capacitor and an inductor are connected in series. At time $t = 0$ the current is zero, but the capacitor is charged. If T is the period of the resulting oscillations, the next time, after $t = 0$ that the energy stored in the electric field of the capacitor is a maximum is:
   A) T
   B) $T/4$
   C) $T/2$
   D) T
   E) $2T$

2. We desire to make an LC circuit that oscillates at 100 Hz using an inductance of 2.5 H. We also need a capacitance of:
   A) 1 F
   B) 1 mF
   C) 1 μF
   D) 100 μF
   E) 1 pF

3. An RLC circuit is driven by an alternative voltage source $E = 162.6\ sin(377t)$ volt. The frequency and the amplitude of this voltage source are:
   A) 50 Hz, 162.6 volt
   B) 60 Hz, 162.6 volt
   C) 50 Hz, 115 volt
   D) 60 Hz, 115 volt
   E) 377 Hz, 162.6 volt

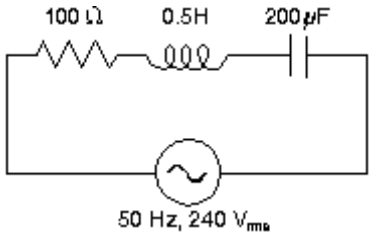
4. An LC circuit has a capacitance of 12 μF and an inductance of 25 mH with a resistance of 6.0 Ω. The circuit oscillates with an angular frequency of:
   A) 1.2×10^3 rad/s
   B) 1.4×10^3 rad/s
   C) 1.8×10^3 rad/s
   D) 2.2×10^3 rad/s
   E) 2.6×10^3 rad/s

5. In a purely inductive circuit, the current lags the voltage by:
   A) 1/4 cycle
   B) 1/2 cycle
   C) 3/4 cycle
   D) 1 cycle
   E) an amount that depends on the frequency

6. When the amplitude of the alternating emf source in a series *RLC* circuit is doubled:
   A) the impedance is doubled
   B) the voltage across the capacitor is halved
   C) the capacitive reactance is halved
   D) the power factor is doubled
   E) the current amplitude is doubled

7. An *RLC* series circuit is connected to an oscillator with $\mathcal{E}_m$ = 100 V. If the voltage amplitudes V_R, V_L, and V_C are all equal to each other, then V_R must be:
   A) 33 V
   B) 50 V
   C) 67 V
   D) 87 V
   E) 100 V

8. The impedance of the circuit shown is:



   A) 41.1 Ω
   B) 100 Ω
   C) 173 Ω
   D) 187 Ω
   E) 241 Ω

Answer Key --

1. C
2. C
3. B
4. C
5. A
6. E
7. E
8. C