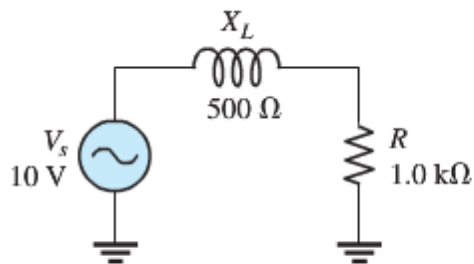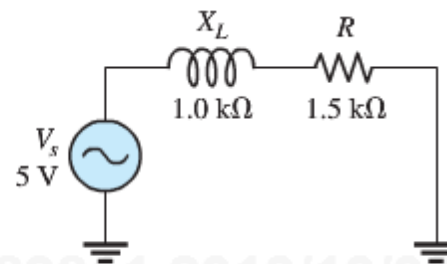Answer the following questions:

1. How much energy is stored by a 100 mH inductor with a current of 1 A?

2. A 15 kHz sinusoidal voltage is applied to a series RL circuit. Determine the frequency of I, V_R, and V_L.

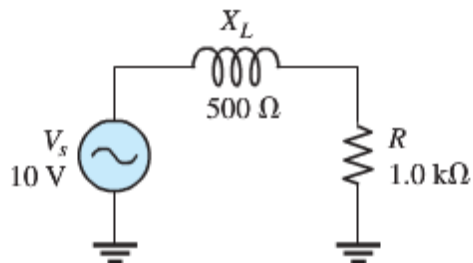3. Find the impedance of each circuit in the following figures.

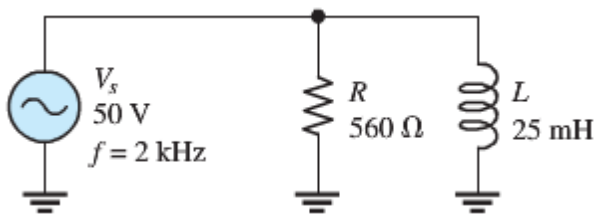

(a)   (b)

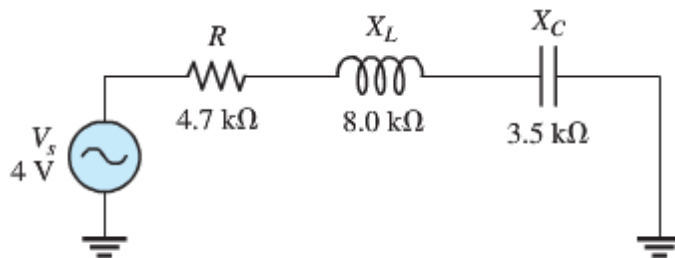4. Assume that the inductance in the following figure is 796 µH. What is the source frequency?

(a)

5. Determine the following quantities in the given figure.

   a. Z
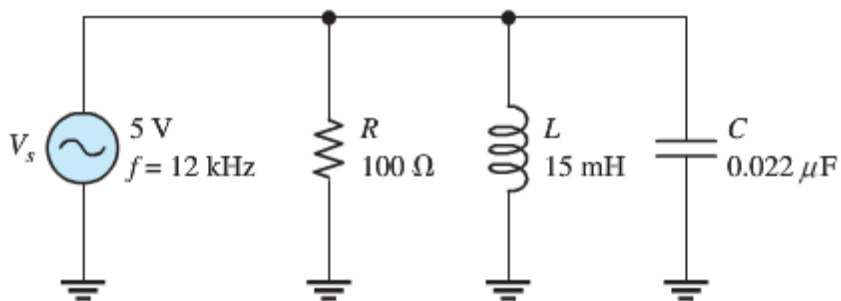
   b. I_R

   c. I_L
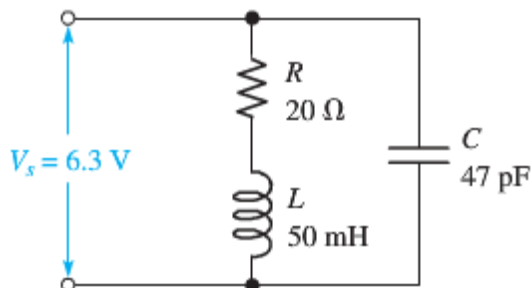
   d. I_{tot}

   e. Θ

6. Draw the voltage phasor diagram for the circuit in the following figure.

7. Is the circuit in the following figure capacitive or inductive? Explain.

8. Find Z at resonance and fr for the tank circuit in the following figure.

9. At resonance, X_L = 2 kΩ and R_W = 25 Ω in a parallel resonant band-pass filter. The resonant frequency is 5 kHz. Determine the bandwidth.

10. In a series RL circuit, determine how long it takes the current to build up to its full value for each of the following:

   a. R = 56Ω, L = 50 µH

   b. R = 3300 Ω, L = 15 mH

   c. R = 22 kΩ, L = 100 mH

11. If the lower cutoff frequency is 2400 Hz and the upper cutoff frequency is 2800 Hz, what is the bandwidth?

Source: Floyd, T. L., & Buchla, D. M. (2013). *DC/AC fundamentals: A systems approach* (1st ed.). Upper Saddle River, NJ: Prentice Hall.

Submission Requirements:

Submit your answers in a Microsoft Word document.

The submission should use:

- Font: Arial; 12-point
- Line spacing: Double

Evaluation Criteria:

Your submission will be evaluated against the following criteria:

- Did you include appropriate steps or rationales to determine the answers to questions wherever required?
- Did you correctly answer each question?