Student ID: 22006482

Exam: 086009RR - Inductors in AC Circuits

When you have completed your exam and reviewed your answers, click **Submit Exam**. Answers will not be recorded until you hit **Submit Exam**. If you need to exit before completing the exam, click **Cancel Exam**.

Questions 1 to 25: Select the best answer to each question. Note that a question and its answers may be split across a page break, so be sure that you have seen the *entire* question and *all* the answers before choosing an answer.

1. An inductor rated at 10 mH and a 100 Ω resistor are in an AC circuit that has a frequency of 100 Hz. What is the inductive reactance at this frequency?

A. 12.56 Ω

B. 6.28 Ω

C. 31.40 Ω

D. 62.8 Ω

2. What is the inductive reactance of a 0.5 H inductor connected with a 1000 Ω resistor in an AC circuit supplied with 48 VAC at 100 Hz?

A. 500 Ω

B. 0.31 Ω

C. 150.72 Ω

D. 314 Ω

3. A series circuit contains a 30 mH inductor and a 200 Ω resistor. What is the total circuit current (rounded) if the applied voltage is 60 V and the frequency is 1000 Hz?

A. 0.84 A

B. 1.24 A

C. 0.44 A

D. 0.22 A

4. What is the time constant of a 5 mH inductor in series with 2000 Ω resistor?

A. 2.5 µs

B. 10 ms

C. 5 ms

D. 10 µs

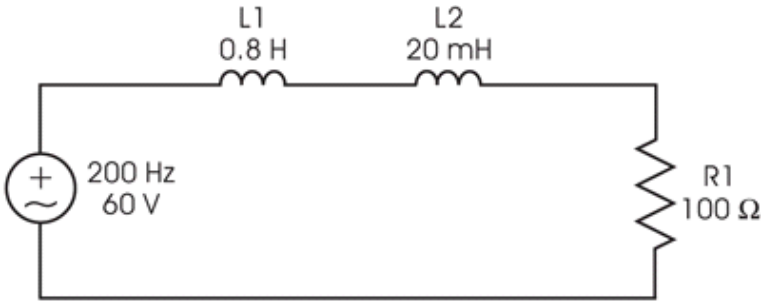
5. If an 80 mH inductor is in series with a 220 Ω resistor in a circuit with a source frequency of 1000 Hz, what will be the phase angle (rounded) of the current with respect to the voltage?

A. 70°

B. 50°

C. 48°

D. 66°



6. What is the inductive reactance of the circuit's two coils as shown in the figure?

A. 308.98 Ω

B. 2574.80 Ω

C. 1029.92 Ω

D. 20.10 Ω

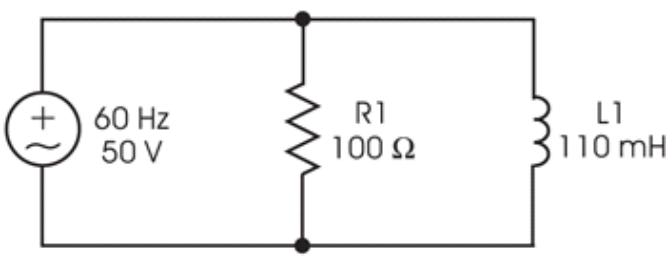
7. A circuit contains a 20 μH and a 60 μH inductor connected in parallel. These two inductors are in series with a 1000 Ω resistor. The circuit has a source voltage of 30 VAC at 10,000 Hz. What is the total inductive reactance of this circuit?

A. 2.43 Ω

B. 0.942 Ω

C. 63.6 Ω

D. 94.2 Ω



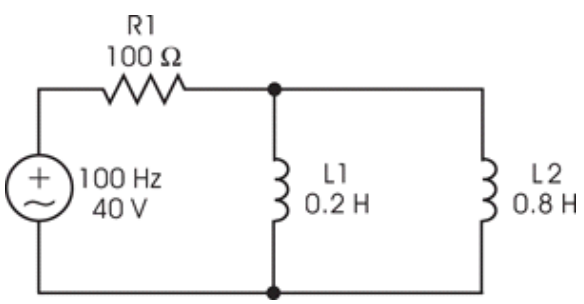
8. What is the current through the inductor shown in the figure?

A. 1.45 A

B. 450.50 A

C. 0.450 A

D. 1.21 A



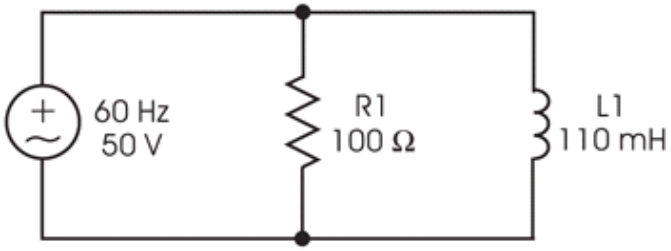
9. What is the impedance of the circuit shown in the figure?

A. 285.15 Ω

B. 60.23 Ω

C. 141.76 Ω

D. 70.88 Ω



10. What is the total current (I_T) of the circuit shown in the figure?

A. 1.71 A

B. 1.50 A

C. 1.31 A

D. 0.88 A

11. A 6 mH, a 2 mH, and a 10 mH inductor are placed in series with a 1000 Ω resistor in a circuit. The circuit has a source voltage of 60 VAC at 1000 Hz. What is the total inductive reactance of this circuit?

A. 93.80 Ω

B. 86.42 Ω

C. 121.64 Ω

D. 113.04 Ω

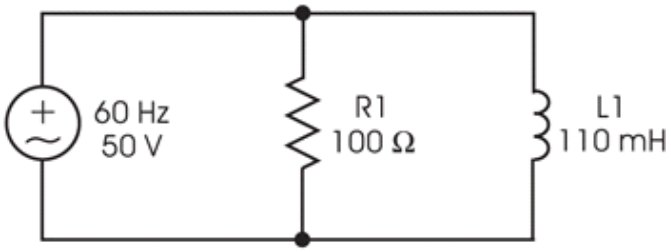
12. A 10 mH inductor and a 100 Ω resistor are connected in parallel. The circuit is supplied with 24 VAC at 2000 Hz. What is the inductive reactance of the inductor?

A. 442.6 Ω

B. 386.2 Ω

C. 125.6 Ω

D. 226.4 Ω



13. What is the inductive reactance of the circuit shown in the figure?

A. 6.91 Ω

B. 41.45 Ω

C. 34.54 Ω

D. 41,448 Ω

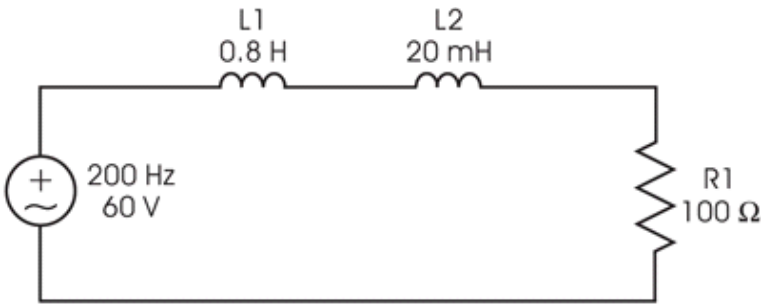
14. A circuit contains a 60 mH and a 40 mH inductor connected in parallel. The circuit has a source voltage of 100 VAC and a frequency of 1000 Hz. What is the total inductive reactance (rounded) of the circuit?

A. 173 Ω

B. 151 Ω

C. 194 Ω

D. 212 Ω



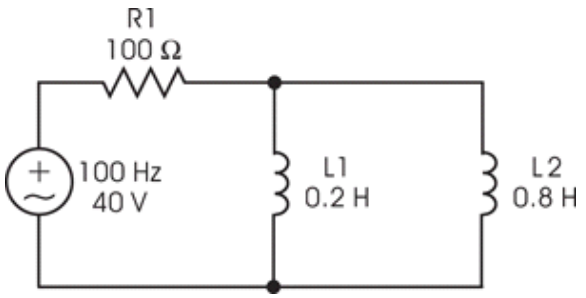
15. What is the total circuit current of the circuit shown in the figure?

A. 0.19 A

B. 0.18 A

C. 0.06 A

D. 0.04 A



16. What is the approximate lagging phase angle for the current in the circuit shown in the figure?

A. 75°

B. 45°

C. 30°

D. 85°

17. A 10 mH inductor and a 100 Ω resistor are connected in parallel. The circuit is supplied with 24 VAC at 2000 Hz. What is the phase angle (rounded) of this circuit?

A. 49.2°

B. 38.4°

C. 24.6°

D. 28.2°

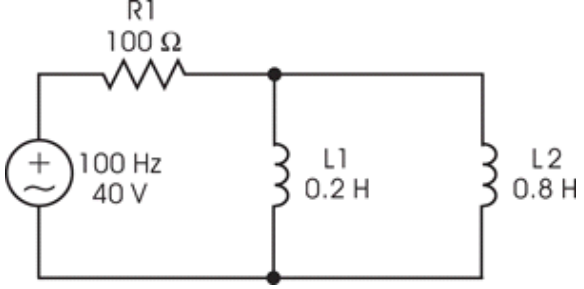
18. Which of the following denotes impedance?

A. R

B. X_L

C. Z

D. H



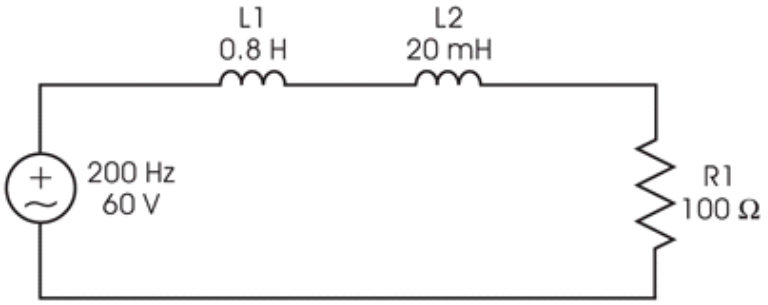
19. What is the total inductance of the circuit shown in the figure?

A. 1.0 H

B. 0.48 H

C. 0.63 H

D. 0.16 H



20. What is the total inductance of the circuit shown in the figure?

A. 0.82 H

B. 20.80 H

C. 2.05 H

D. 51.25 H

21. If you doubled the voltage frequency in an RL series AC circuit, the inductive resistance would

A. increase by only one quarter.

B. also double.

C. remain constant.

D. decrease by only one half.

22. A 10 mH inductor and a 100 Ω resistor are connected in parallel. The circuit is supplied with 24 VAC at 2000 Hz. What is the impedance (rounded) of the circuit?

A. 57.38 Ω

B. 78.23 Ω

C. 108.71 Ω

D. 98.16 Ω

23. A circuit has an inductor with an inductive reactance of 230 Ω. This inductor is in series with a 500 Ω resistor. If the source voltage is 24 V, what is the total circuit current (rounded)?

A. 0.44 A

B. 0.04 A

C. 0.18 A

D. 0.22 A

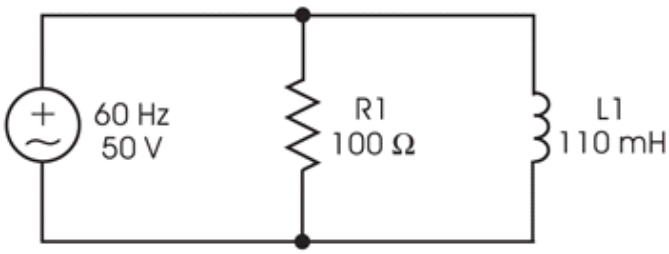
24. Which of the following denotes inductive reactance?

A. R

B. X_L

C. H

D. Z



25. What is the current through the resistor in the circuit shown in the figure?

A. 5 A

B. 0.50 A

C. 0.60 A

D. 2 A

End of exam