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Courses » Fundamentals of Acoustics

Announcements **Course** Forum Progress Mentor

Unit 6 - Week 05: 1-D Waves ✎

Course outline

How to access the portal?

Week 01:
Introduction and Terminology

Week 02:
Concept Review

Week 03:
Wave equation

Week 04:
Transmission line equations

Week 05: 1-D Waves

- Lesson 1: Instantaneous Power
- Lesson 2: Instantaneous Power in a L-R Circuit
- Lesson 3:

Week 5 Assignment ✎

The due date for submitting this assignment has passed.

Due on 2017-02-28, 23:59 IST.

Submitted assignment

1) Unit of specific acoustic impedance is:

1 point

- N S/m².
- Pa.S/m².
- Pa.S/m³.
- Pa.S/m.

2) Which of the following thermodynamic process accurately captures the behavior of gas when an acoustic wave passes through it?

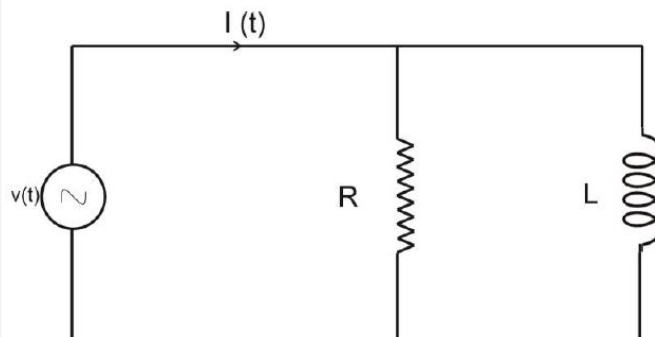
1 point

- Isobaric process.
- Isochoric process.
- Isothermal process.
- Adiabatic process.

3) A resistor (R) is connected across the terminals of a voltage source $v(t)$.

1 point

What will happen when an inductor (L) is added in parallel to this resistor as shown in figure?



Power
Factor, and
Acoustic
Power

● Lesson 4:
Power Flow
into an
Infinitely
Long Tube

● Lesson 5:
Point
Sources of
Sound

● Lesson 6:
Relations for
Outward
Travelling
Spherical
Acoustic
Wave

○ Quiz : Week
5
Assignment

● Week 5
Assignment
Solution

**Week 06:
Power and
spherical
waves**

**Week 07:
Spherical
waves and
interference**

**Week 08:
Directivity
and mufflers**

**Week 09:
Sound in
rooms**

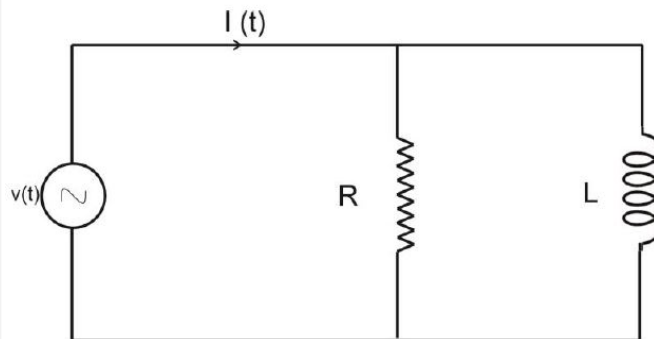
**Week 10:
Reverb time
and FFT**

**Week 11:
Weighting
and loudness**

**Week 12:
Miscellaneous**

- Instantaneous power in the circuit will remain the same.
- Power factor of the system will reduce.
- Current, $I(t)$ will reduce.
- Power dissipated in the network will reduce.

4) In the L-R circuit shown below, resistance $R=100 \Omega$ and inductance, $L=1/(2\pi)$ **1 point**
H. Find the instantaneous power $P(t)$ when voltage, $v(t)=10\cos(120\pi t)$ is applied as shown below.



- $0.5 + 1.707 \cos(240\pi t - \pi/4)$
- $0.5 + 0.707 \cos(240\pi t - \pi/4)$
- $0.5 + 1.707 \sin(240\pi t - \pi/4)$
- $0.5 + 0.707 \cos(240\pi t - \pi/6)$

5) Which of the following statement is true about power factor of an AC electrical power system. **1 point**

- Power factor is the ratio of real power flowing to the load to the apparent power in the circuit.
- Power factor is the ratio of apparent power in the circuit to real power flowing to the load.
- Power factor = 1, means the system is inductive.
- Value of power factor is in the open interval $(0, 1)$.

6) Scalar product of instantaneous acoustic pressure and instantaneous particle velocity will result in _____. **1 point**

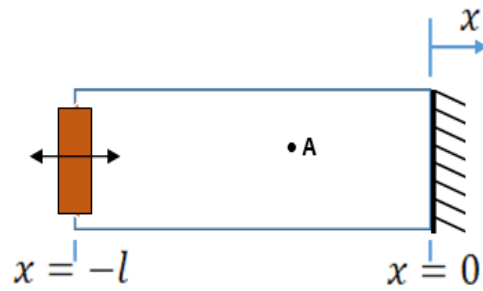
- Instantaneous power.
- Instantaneous energy.
- Instantaneous power per unit area.
- Instantaneous energy per unit area.

7) While buying a house hold equipment, which type of equipment will draw least amount of current? **1 point**

- Equipment with pure resistor of 10 Ohms in the circuit.
- Equipment with an inductor and a resistor of 10 ohms in parallel.
- Equipment with a capacitor and a resistor of 10 ohms in parallel.
- Options b, and c are correct.

8) For the closed tube shown below, a reciprocating sound source excites the medium inside it at $x=-l$. For such a system, _____. **1 point**

topics and
closure



- Resistive part of specific acoustic impedance at point A is zero.
- Reactive part of specific acoustic impedance at point A is zero.
- Total power dissipated by sound source into the system over a cycle is not zero.
- None of the options is correct.

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