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NPTEL

Courses » Fundamentals of Acoustics

Announcements   **Course**   Forum   Progress   Mentor

Unit 2 - Week 01: Introduction and Terminology ✎

Course outline

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Week 01: Introduction and Terminology

● Lesson 1: Course Overview

● Lesson 2: Introduction

● Lesson 3: Nature Of Sound

● Lesson 4: The Decibel Scale

● Lesson 5: Key Terms in Acoustics

● Lesson 6: Adding Decibels

○ Quiz : Week 1 Assignment

● Week 1 Assignment

Week 1 Assignment ✎

The due date for submitting this assignment has passed.
Due on 2017-02-07, 23:59 IST.

Submitted assignment

1) Which of the following option characterizes a transverse wave?   *1 point*

○ Particle displacement is perpendicular to the direction of wave propagation.
○ Particle displacement is parallel to the direction of wave propagation.
○ Particle displacement is in random direction to the wave propagation.
○ None of the options are correct.

2) Let u be the velocity of particle in a media and c be the velocity of wave   *1 point*
propagation. Out of the following options choose the correct statement regarding wave propagation.

○ values of u and c are always equal.
○ values of u and c can be different.
○ values of u and c are always different.
○ None of the options are correct.

3) In air, sound travels as _____.   *1 point*

○ Longitudinal wave.
○ Transverse wave.
○ Rayleigh wave.
○ Electro magnetic waves.

4) Beats phenomena occur due to _____ between two sound waves whose   *1 point*
frequencies are close to each other.

○ Diffraction
○ Refraction
○ Interference

○ Reflection

5) What is the auditory threshold pressure at 1 KHz?   *1 point*

   ○ 2 µPa (RMS)
   ○ 20 Mpa (peak to peak)
   ○ 20 µPa (peak to peak)
   ○ 20 µPa (RMS)

6) Which physical quantity is used to characterize sound pressure level in dB?   *1 point*

   ○ Amplitude of pressure fluctuations produced due to pressure wave.
   ○ Amplitude of absolute pressure produced due to pressure wave.
   ○ RMS value of pressure fluctuations produced due to pressure wave.
   ○ RMS value of absolute pressure produced due to pressure wave.

7) Define sound intensity.   *1 point*

   ○ Sound intensity is the sound pressure per unit area.
   ○ Sound intensity is the sound velocity per unit area.
   ○ Sound intensity is the sound energy per unit area.
   ○ Sound intensity is the sound power per unit area.

8) What is the value of reference pressure used to find sound pressure level in   *1 point*
air?

   ○
   $$2 * 10^{-5} Pa$$

   ○
   $$2 * 10^{-6} Pa$$
   ○
   $$2 * 10^{5} Pa$$
   ○
   $$2 * 10^{6} Pa$$

9) Sound power is proportional to _____.   *1 point*

   ○
   $$\text{sound pressure}$$
   ○

   $$(\text{sound pressure})^{2}$$
   ○

   $$(\text{sound pressure})^{1/2}$$
   ○

   $$(\text{sound pressure})^{-2}$$

10) Which of the following options represent an octave?   *1 point*

   ○ 50 to 100 Hz
   ○ 50 to 500 Hz

○ 50 to 400 Hz
○ 50 to 58 Hz

11)What is the expression for wave number (k)?   *1 point*

○

$$k = \frac{\text{frequency in } \frac{rad}{s}}{\text{wave velocity}} \Bigg|$$

○

$$k = \frac{\text{frequency in Hz}}{\text{wave velocity}} \Bigg|$$

○

$$k = \frac{\text{wave velocity}}{\text{frequency in } \frac{rad}{s}} \Bigg|$$

○

$$k = \frac{\text{wave velocity}}{\text{frequency in Hz}} \Bigg|$$

12)Which of the following option characterizes pink noise?   *1 point*

○ Equal power with in a fixed bandwidth for any center frequency.
○ Constant power spectral density.
○ Power spectral density is inversely proportional to frequency.
○ None of the options are correct.

13)Consider two sound sources working in a room. Which of the following option *1 point*
represents right way to find out total dB level inside the room?

○ Directly add up individual sound pressure level in dB.
○ Add up sound power produced by each source and then find the dB value
corresponding to total power.
○ Add up sound pressure produced by each source and then find the dB value
corresponding to total pressure.
○ All the options are correct.

14)20 dB increase in sound pressure level corresponding to _____ increase in   *1 point*
power.

○ $initial\ power\ in\ Watts \times 100\ times$
○ $initial\ power\ in\ Watts \times 20\ times$
○ $initial\ power\ in\ Watts + 20\ times$
○ $initial\ power\ in\ Watts + 200\ times$

15)Sound pressure level heard by a listener when there is a wall present   *1 point*
between a source and the listener is 76 dB. If the wall attenuates sound by 70 dB, what
is the actual sound level produced by the source?

○ 77 dB.
○ 6 dB.
○ 146 dB.
○ 76 dB.

16)Out of the following options, when can we directly add amplitudes of individual*1 point*
signals to get the total amplitude of the signal?

○ When the signals are co-related signals.

○ When the signals are non co-related signals.

○ When the signals are co-related or non co-related.

○ All the options are correct.

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