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NPTEL

Courses » Fundamentals of Acoustics

Announcements　　**Course**　　Forum　　Progress　　Mentor

Unit 10 - Week 09: Sound in rooms ✏

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

Week 06: Power and spherical waves

Week 07: Spherical waves and interference

Week 9 Assignment ✏

The due date for submitting this assignment has passed.

Submitted assignment

Due on 2017-03-28, 23:59 IST.

1) Unit of wave number (k) is:　　　　　　　　　　　　　　　　　　*1 point*

- ○ Radians per meter
- ○ Meter per radians
- ○ Dimensionless
- ○ Meter per second

2) During sound propagation in a fluid media, particle acceleration is directly　　*1 point*
proportional to _____.

- ○ Velocity gradient
- ○ Pressure gradient
- ○ Square of velocity gradient
- ○ Square of pressure gradient

3) Resistive mufflers are also known as _____.　　　　*1 point*

- ○ Dissipative mufflers
- ○ Reactive mufflers
- ○ Expansion mufflers
- ○ Hybrid mufflers

4) We have to measure sound inside a room which has reflective surfaces.　　*1 point*
Which type of microphone will you suggest for this application?

- ○ Pressure field microphone
- ○ Diffuse field microphone
- ○ Free field microphone
- ○ None of the options are correct

5) Velocity of sound in air is_____.　　　　　　　　　　　*1 point*

○ 345 m/s
○ 300 m/s
○ 1130 m/s
○ 1030 m/s

6) Transmission loss of a muffler can be expressed as _____.　　*1 point*
(where, A is transmission coefficient)

○ 10 log10 (A)
○ 10 log10 (1/A)
○ 10 log10 (2/A)
○ 10 log10 (A/2)

7) Transmission loss of a muffler will be maximum for a 70 Hz sound if the exact *1 point*
length of muffler would be_____.

○ 2.9 m
○ 0.5 m
○ 2.5 m
○ 1.23 m

8) Find the Fourier series for a periodic function *f(t)* defined below　*1 point*
over one period

$$f(t) = \begin{cases} \dfrac{4t}{\pi}; & 0 \le t \le \dfrac{\pi}{2} \\ -\dfrac{4t}{\pi}; & \dfrac{-\pi}{2} \le t \le 0 \end{cases}$$

○ $1 + \sum\limits_{n=1}^{\infty} [\dfrac{4}{n^2\pi^2}(-1^n - 1)\, Cos\, 2nt\,]$

○ $\sum\limits_{n=1}^{\infty} [\dfrac{4}{n^2\pi^2}(1^n + 1)\, Cos\, 2nt\,]$

○ $1 + \sum\limits_{n=1}^{\infty} [\dfrac{2}{n^2\pi^2}(2n + 1)\, Sin\, 2nt\,]$

○ $\sum\limits_{n=1}^{\infty} [\dfrac{2}{n^2\pi^2}(2n - 1)\, Sin\, 2nt\,]$

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NPTEL National Programme on Technology Enhanced Learning

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