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NPTEL

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Courses » Fundamentals of Acoustics

Announcements **Course** Forum Progress Mentor

# Unit 3 - Week 02: Concept Review ✎

## Course outline

How to access the portal?

**Week 01:**  
Introduction and Terminology

**Week 02:**  
Concept Review

● Lesson 1:  
Important Mathematical Concepts- Complex Algebra

● Lesson 2:  
Important Mathematical Concepts- Complex Time Signals

● Lesson 3:  
Important Mathematical Concepts- Transfer Function

● Lesson 4:

## Week 2 Assignment ✎

The due date for submitting this assignment has passed.

**Due on 2017-02-09, 11:59 IST.**

### Submitted assignment

1) 1 point  
Complex signals have \_\_\_\_\_.

- magnitude.
- phase.
- both magnitude and phase.
- neither magnitude nor phase.

2) Consider a signal, 1 point  
 $x(t) = \text{Re}(Ae^{jD+(B-jC)jt})$ .

What is the phase of  $x(t)$  ? (A, B, C and D are positive constants)

- A
- B
- C
- D

3) Consider a signal, 1 point  
 $x(t) = \text{Re}(Ae^{jD+(B-jC)jt})$ .

What can we conclude about decay or growth of  $x(t)$  ? (A, B, C and D are positive constants)

- $x(t)$  will grow with rate of growth of C.
- $x(t)$  will grow with rate of growth of B.
- $x(t)$  will decay with rate of decay of C.
- $x(t)$  will decay with rate of decay of B.

4) Which of the following systems is linear in 'X' ? 1 point

Important  
Mathematical  
Concepts-  
Pole Zero  
Plot

● Lesson 5:  
Important  
Mathematical  
Concepts -  
Bode Plot  
For Simple  
Pole

● Lesson 6:  
Important  
Mathematical  
Concepts -  
Bode Plot  
For Simple  
Zero

○ Quiz: Week  
2  
Assignment

● Week 2  
Assignment  
Solution

**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 08:  
Directivity  
and mufflers**

**Week 09:  
Sound in  
rooms**

- $y(t) = \sin(x(t))$
- $y(t) = \log(x(t))$
- $y(t) = \cos(x(t))$
- $y(t) = dx(t)/dt$

5) What is an ideal value of system function at poles? **1 point**

- Zero
- Unity
- Infinity
- Finite and non-zero

6) Which of the following option is not correct regarding the transfer function? **1 point**

- Transfer function is defined as a mathematical representation of a system's response with respect to stimulus.
- Transfer function is applied in transient response region of the system.
- Transfer function can be applied to linear system.
- All the options are correct.

7) Which of the following option can be considered as a transfer function ? **1 point**

- $H(s) = (\text{Output current}) / (\text{Input current})$
- $H(s) = (\text{Output current}) / (\text{Input voltage})$
- $H(s) = (\text{Output voltage}) / (\text{Input current})$
- All of the options can be considered as transfer functions.

8) If  $H(\omega) = 1/\omega$ , how is  $H(\omega)$  represented on the magnitude Bode plot? **1 point**

- $-10 \log(\omega) \text{ dB}$
- $-20 \log(\omega) \text{ dB}$
- $-40 \log(\omega) \text{ dB}$
- $-60 \log(\omega) \text{ dB}$

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**Week 10:  
Reverb time  
and FFT**

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**Week 11:  
Weighting  
and loudness**

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**Week 12:  
Miscellaneous  
topics and  
closure**

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