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NPTEL

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Courses » Introduction to Time-Frequency Analysis and Wavelet Transforms

Announcements

Course

Ask a Question

Progress



Unit 6 - Week 1: Introduction, Basic definitions and Concepts

Course outline

Registration for
MATLAB Exam

How to access the
portal

MATLAB Online Access

MATLAB Tutorials
created by MathWorks

Week 1: Introduction,
Basic definitions and
Concepts

● Lecture 1.1 A:
Introduction 1a

● Lecture 1.1 B:
Introduction 1b

● Lecture 1.2 A:
Introduction 2a

● Lecture 1.2 B:
Introduction 2b

● Lecture 2.1: Basic
Definitions and
Concepts-I

● Lecture 2.2: Basic
Definitions and
Concepts-II

● Lecture 2.3: Basic
Definitions and
Concepts-III

● Solutions to Week-1
Assignment

○ Quiz : Week 1
Assignment

Week 2: Fourier
transforms (a review)

Week 3: Duration and
Bandwidth

Week 4: Short-time
Fourier transform

Week 5: Wigner-Ville
Distributions

Week 6: Wigner-Ville
Distributions (Contd..)

Week 7: Continuous
Wavelet Transforms

Week 8: Continuous
Wavelet Transforms
(Contd..)

Week 9: Discrete
Wavelet Transforms

Week 10: Discrete
Wavelet Transforms
(Contd..)

Week 1 Assignment

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2016-07-28, 23:59 IST

1)

1 point

1. Which of the following is **not** an example of a multi-scale process ?
- Movement of the hands of a clock.
 - Soldiers marching in a parade
 - A PEM fuel cell.
 - A stack containing 6 PEM fuel cells.

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

2)

1 point

2. Which of the following methods directly computes the joint energy distribution of a without using a transform?
- Wavelet Transforms.
 - Wigner-Ville Distribution.
 - Short Time Fourier Transforms.
 - None of the above.

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

3)

1 point

3. Which of the following statements is false?
- Wigner-Ville distribution are free of interference terms.
 - Analyzing functions in Fourier Transforms span the entire time axis.
 - Wigner-Ville distribution are ideally suited for chirp signals.
 - None of the above.

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

Week 11: Discrete
Wavelet Transforms
(Contd..)

Week 12: DWT (Contd.)
and Closing Summary

a

4)

1 point

4. Pick the most appropriate option regarding wavelet transforms from the following.
- They are suited to analyze signals with long lasting low frequency components.
 - They are suited for signals with short lived high frequency components.
 - Both (A) and (B)
 - None of the above.

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

5)

1 point

5. Which of the following statements is true?
- Stochastic signals are always absolutely unpredictable.
 - The value of a stochastic signal at each instant of time is probabilistic in nature.
 - Stochastic signals are describable by a mathematical function.
 - None of the above.

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

6)

1 point

6. Which of the following statements is/are true?
- CCVF is measure of linear relationship between two lagged signals.
 - CCVF is symmetric while the ACVF is not.
 - ACVF can detect the periodicities embedded in noise.
 - None of the above.

Note: CCVF - Cross covariance function, ACVF - Auto covariance function.

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

c

7)

1 point

7. The continuous time signal $x(t) = (1 + \cos(\sqrt{3\pi}t))^{1/3}$ is
- Aperiodic
 - Constant
 - Periodic
 - None of the above

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

8)

1 point

8. The period of the discrete time signal $x[k] = \sin^2(\sqrt{13}k)$

- a. is equal to 7 samples.
- b. is equal to 49 samples.
- c. does not exist.
- d. None of the above.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

9)

1 point

9. The continuous signal $x(t) = 6 + \sin(6t)$ is sampled every $\frac{\pi}{900}$ seconds. The period of the discrete analogue $x[k]$ is

- a. 200 samples.
- b. 300 samples.
- c. 600 samples.
- d. 900 samples.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

10)

1 point

10. A continuous-time signal $x(t) = \cos(0.2\pi t)$ is sampled at two different sampling intervals of 1 sec and 11 sec to obtain their discrete-time counterparts as $x_1[k]$ and $x_2[k]$ respectively. Which of the following is/are true for these discrete-time signals.

- a. The discrete-time frequency of x_1 is 0.1
- b. The discrete-time frequency of x_2 is 0.6
- c. x_2 is an alias of x_1 .
- d. None of the above.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

c

11)

1 point

11. Which of the following sampling rates would not be appropriate for the following signal

$$x(t) = 2 \sin(100\pi t) + 3 \sin(130\pi t)$$

- a. 150 Hz.
- b. 100 Hz.
- c. 130 Hz.
- d. All of the above.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

12)

1 point

12. Which of the following are true for the discrete-time signals: $x_1[k] = \sin(\pi k) + \cos(\pi k)$ and $x_2[k] = \sin(\pi k) - \cos(\pi k)$.

- a. Cross correlation at all lags is 0.
- b. Cross correlation at all lags is -1.
- c. Cross correlation at even lags is 1 while odd lags is -1.
- d. Cross correlation at even lags is -1 while odd lags is 1.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

13)

For questions 13 to 15, the answer is of the form of an integer, to be filled in the blank space.

13. The polar representation of the number $z = 6 + 8j$ is _____ $e^{j \arg(z)}$

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) 10

1 point

14)

14. The vectors $x_1 = [1 \ 2 \ 1 \ 1]^T$, $x_2 = [3 \ 1 \ 2 \ 1]^T$, $x_3 = [1 \ 1 \ 1 \ 1]^T$, $x_4 = [0 \ 1 \ 1 \ 2]^T$ span the space \mathbb{R}^N . The value of N is _____.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) 3

1 point

15)

15. If a 5×6 matrix has two linearly independent rows, then the dimension of its null space is _____.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) 4

1 point

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End



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