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Courses » Machinery Fault Diagnosis And Signal Processing

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## Unit 6 - Week 4

Register for  
Certification exam

## Course outline

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portal

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- Lecture 16 : Computer aided data acquisition

- Lecture 17 : Wireless Data Acquisition

- Lecture 18 : Data Recording

- Lecture 19 : Cepstrum Analysis

- Lecture 20 : Hilbert Transform in Condition Monitoring

- Week 4 : Lecture Material

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## Assignment 4

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

Due on 2019-02-27, 23:59 IST

1) 1 point  
How many operations are required in fast Fourier transform for N number of data points?

- a. N
- b.  $N \log_2 N$
- c.  $N^2$
- d. None of these

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

2) Which one is not a type of data acquisition error? 1 point

- a. Signal aliasing
- b. bias error
- c. Quantization error
- d. None of these

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

3) Signal aliasing can be prevented if sampling frequency  $f_s \geq f_{max}$  1 point

- a. True
- b. False

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## Assignment Solution

4) 1 point  
Due to slower sampling rate, the original signal appears to be a low frequency signal. The error caused is known as

- a. Quantization error
- b. Aliasing error
- c. Leakage error
- d. None of these

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

5) 1 point  
For a signal whose maximum frequency is unknown, to prevent aliasing error, low pass filter is to be used with cutoff frequency

- a. Twice the sampling frequency
- b. Half the sampling rate
- c. Same as the sampling rate
- d. None of these

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

6) Inverse fast Fourier transform is used for 1 point

- a. Time to frequency domain transformation
- b. Time to time domain transformation
- c. Frequency to time domain transformation
- d. Frequency to frequency domain transformation

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(c)

7) 1 point  
During conversion of a bipolar signal of amplitude 5 V from analog to digital values, an ADC of amplitude resolution 1.25 V is used. What is the bit size required for a binary data recorder?

- a. 1 bit
- b. 2 bit
- c. 3 bit
- d. 4 bit

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(c)

8) Digitization error is due to

- a. Inadequate sampling
- b. Leakage
- c. Lower value of amplitude resolution of ADC than analog signal
- d. Higher value of amplitude resolution of ADC than analog signal

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(d)

9) Short-time Fourier transform is useful in determining

- a. Frequency content which is same throughout the signal
- b. Frequency content that changes over time
- c. Both a. and b.
- d. None of these

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

10) Which quantity among these has both magnitude and phase?

- a. Autopower spectrum
- b. Cross-power spectrum
- c. Coherence function
- d. None of these

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

11)



1 point



1 point

1 point

1 point

Two independent signals which are not correlated has a coherence value of

- a. 0
- b. 0.5
- c. 1
- d. 2

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a)

12)

The peak-to-peak analog voltage to ADC is 5 V. What is the amplitude resolution of an ADC of size 12 bits?

- a. 1.22 V
- b. 1.22 mV
- c. 2.44 mV
- d. Cannot be determined

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

13)

The quefreny in Cepstrum analysis is equivalent to time

- a. True
- b. False

- (a)
- (b)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a)

14)

Which is true for Hilbert transform?

- a. It converts signal from time domain to frequency domain
- b. It converts signal from time domain to time domain
- c. It converts the signal from frequency domain to time domain
- d. None of these

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0



1 point

1 point

1 point

Accepted Answers:

(b)

15)

1 point

When a signal contains many families of sidebands, which is the most suitable technique for analysis?

- a. Hilbert transform
- b. Cepstrum analysis
- c. Fast Fourier transform
- d. None of these

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

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