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B.TECH.

THEORY EXAMINATION (SEM–VIII) 2016-17

SPEECH PROCESSING

Time : 3 Hours ***Max. Marks : 100***

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION A

1 Attempt all parts: (10X2=20)

a. Why is pitch? Explain.
b. Explain acoustic phonetics.
c. Why sampling is required? Explain.
d. Define channel vocoder.
e. What do you mean by frequency domain? Explain.
f. Define correlation function with example.
g. What do you understand by filter? Explain.
h. Differentiate between speech and silence.
i. Define convolution with an example.
j. What is linear predictive coding? Explain.

SECTION B

2 Attempt any FIVE parts: (10X5=50)

a. What do you mean by sampling and quantization as related to speech signal? Discuss it with the help of an example.
b. Write a note on the digital models for speech signals using example.
c. Draw the block diagram of a speech processing system and enumerate the applications of speech processing.
d. Describe the short term pitch detection using block diagram and also discuss its working with an example.
e. Discuss voiced/unvoiced system model for speech signal detection using block diagram.
f. What are the various speech parameters? Discuss the relation between these parameters.
g. Write a note on spectrographic display with suitable block diagram.
h. Describe Homomorphic speech processing with example.

SECTION C

Attempt any TWO questions: (15X2=30)

3 What is speech synthesis? Explain. Discuss the significance of LPC in speech synthesis system. Derive mathematical expression linear predictor coefficients.

4 What is short-time Fourier analysis? Explain the properties of short-time Fourier analysis. Discuss the filter bank interpretation of short-time Fourier analysis and synthesis in detail.

5 Write note on the following:

a. Autocorrelation method.
b. Normalized mean square error.
c. Formant estimation.

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