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BTECH
(SEM VIII) THEORY EXAMINATION 2021-22
SPEECH PROCESSING

Time: 3 Hours

Total Marks: 70

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 7 = 14

a.	What is speech mechanism in phonetics?
b.	What are the mechanism of speech production?
c.	Differentiate between speech and silence
d.	Define channel Vocoder
e.	Explain acoustic phonetics
f.	Define convolution with an example
g.	Define correlation function with example.

SECTION B

2. Attempt any three of the following: 7 x 3 = 21

a.	Discuss Holomorphic speech processing with example.
b.	What do you mean by windowing? Explain the concept of short-time speech processing with suitable general block diagram.
c.	Illustrate the applications of LPC parameters with suitable figures.
d.	Analysis the cognitive effects that are important for assessment of subjective audio quality.
e.	How pitch of a speech signal is estimated using parallel processing approach?

SECTION C

3. Attempt any one part of the following: 7 x 1 = 7

(a)	Discuss how lossy audio coding is done using sub band coding and psycho acoustics models.
(b)	Write a note on spectrographic display with suitable block diagram.

4. Attempt any one part of the following: 7 x 1 = 7

(a)	Describe the short term pitch detection using block diagram and also discuss its working with an example
(b)	Explain the working of analyzer and synthesizer of holomorphic vocoder.

5. Attempt any one part of the following: 7 x 1 = 7

(a)	Discuss voiced/unvoiced system model for speech signal detection using block diagram.
(b)	What do you mean by sampling and quantization as related to speech signal? Discuss it with the help of an example.

6. Attempt any one part of the following: 7 x 1 = 7

(a)	Draw the block diagram of a speech processing system and enumerate the applications of speech processing.
(b)	Write note on the following: a. Autocorrelation method. b. Normalized mean square error.

7. Attempt any one part of the following: 7 x 1 = 7

(a)	What is short-time Fourier analysis? Explain the properties of short-time Fourier analysis
(b)	Write a note on the digital models for speech signals using example.