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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020

Course Code: EC463

Course Name: SPEECH AND AUDIO SIGNAL PROCESSING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1 a) Write the algorithm for computing LPC coefficients using autocorrelation method. (8)

b) Define briefly the idea behind short time energy and short time zero crossing rate. (7)

2 a) Explain with the help of a neat diagram the acoustic theory of speech production. (8)

b) Define mathematically the need of STFT & Spectrogram in speech signals. (7)

3 a) Explain with the help of a block diagram the steps involved in obtaining MFCC coefficients of a speech signal. (7)

b) Define the fundamentals of Speech recognition. (8)

PART B

Answer any two full questions, each carries 15 marks.

4 a) Explain the significance of sub-banding coding for speech signals. (8)

b) List various steps involved in language identification. (7)

5 a) Define the steps of speaker verification in a speech signal. (7)

b) Explain MPEG psychoacoustic model of audio perception. (8)

6 a) Explain the psycho-acoustic analysis steps of an audio signal. (8)

b) With the help of a neat diagram, explain the anatomy of hearing System. (7)

PART C

Answer any two full questions, each carries 20 marks.

7 a) Explain mathematically the concept of MDCT and its properties. (10)

b) Briefly define the audio compression methods. (10)

8 a) Explain any two subjective analysis methods to measure the audio quality. (10)

b) Explain any two spatial audio standards. (10)

9 a) Explain any one objective analysis method to analyse the audio quality. (10)

b) Briefly define the MPEG2-AAC coding standard of digital audio. (10)

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