

SIXTH SEMESTER B.TECH DEGREE EXAMINATION

Branch: Electronics & Communication

13.606.1 SPEECH PROCESSING (AT) (Elective II)

Time: 3 Hours

Max. Marks: 100

Answer all questions

Part – A

1. Differentiate between Voiced and Unvoiced speech signals.
2. Briefly explain the following terms:
 - (i) Phonemes
 - (ii) Formants
3. Draw the digital model of speech production.
4. Explain briefly the concept of quefreny and cepstrum.
5. Define Mel frequency –cepstral coefficients
6. Explain the concept of correlation based pitch extraction.
7. What are the characteristics of speech signal?
8. What is prosody? Why is it important in speech systems?
9. What is the relevance of Short time Fourier transform?
10. What information concerning formants and manner of articulation can be found from the zero-crossing rate?

(2×10 marks=20 marks)

Part – B

MODULE I

11.(a) Explain the speech production mechanism (10)

(b) Explain the classification of speech sounds. (10)

OR

12.(a) With appropriate equations, explain the digital model of vocal tract system. (10)

(b) What is the significance of Short time analysis in speech processing? (10)

MODULE II

13. (a) Explain the different functions used in time domain analysis of speech signals. (10)

(b) Explain adaptive DPCM (10)

OR

14. Explain: (a) (10)

(i) Instantaneous quantization

(ii) Adaptive quantization

(b) What are the different techniques of Pitch estimation? (10)

MODULE III

15. (a) Explain the importance of spectrogram in Speech analysis. (10)

(b) Explain any two methods of formant extraction. (10)

OR

16. (a) Explain the filtering view of Short time fourier transform. (10)

(b) Explain the Analysis-synthesis system. (10)

MODULE IV

17. (a) Explain the concept of Linear prediction in the analysis of speech. (10)

(b) Explain the concept of homomorphic signal processing with the help of necessary block diagrams. (10)

OR

18. (a) Explain Linear prediction in autocorrelation and spectral domains. (10)

(b) Write notes on Speech recognition and Speaker verification. (10)

