Register Number | | | | | | | | | | | |

B.E/B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2011
ELECTRONICS AND COMMUNICATION BRANCH
SIXTH SEMESTER (REGULATION 2008)
EC 9041 SPEECH PROCESSING

39

Time : 3 Hrs Max. Mark :100

Answer ALL Questions

PART-A (10 x 2 = 20 Marks)

1. What is the role of glottis in speech production?
2. Give an example for unvoiced plosive and voiced plosive.
3. What is the basic principle in linear prediction analysis?
4. What is the disadvantage of linear time warping?
5. What is the role of Viterbi decoding in HMM?
6. Why HMM is called as doubly-stochastic?
7. Name the features typically used for speech recognition task.
8. What is meant by context dependent sub-word units?
9. What are the basic steps involved in Text-to-Speech task?
10. What is the suitable subword unit for speech syntheis task.

PART-B (5 x 16 = 80 Marks)

11. Explain in detail about Concatenative and waveform synthesis methods for the synthesis of speech signals. (16)

12a)(i) What is the significance of short-term analysis? Explain the window functions used in speech processing. What are their differences in time- and frequency-domain? (8)

(ii) Explain the speech production mechanism using three cavity model. (8)

(OR)

12.b)(i)Classify and explain the acoustic characteristics of various phonemes. (8)

(ii) What are the various practical considerations for the design of digital filter banks for speech processing? (8)

13.a) Describe homomorphic processing technique. How to estimate the formants and pitch frequency using cepstrum based analysis. (16)

(OR)

13.b) Write in detail the theoretical formulation of linear prediction analysis technique and explain the autocorrelation (or covariance) based technique for LP analysis. (16)

14.a) What is HMM? Explain the computation of likelihood of an observation sequence using exhaustive and forward/backward algorithms. (16)

(OR)

14.b) With necessary equations, explain in detail the algorithmic steps involved in Baum-Welch Parameter Re-estimation. (16)

15.a) What are the different kinds of speech recognition systems? Explain how isolated word recognition system works. (16)

(OR)

15.b) Develop an architecture of a large vocabulary continuous speech recognition system and explain it in detail. (16)