# **Question Paper**

Exam Date & Time: 08-May-2024 (02:30 PM - 05:30 PM)



# MANIPAL ACADEMY OF HIGHER EDUCATION

## DEPARTMENT OF COMPUTER SCIENCE & ENGG.

### VI SEMESTER - CSE-AIML END SEM EXAMINATION

#### ELECTIVE-SPEECH PROCESSING [CSE 4023]

Marks: 50

Answer all the questions.

Duration: 180 mins.

#### Questions

1)	With a neat diagram, explain task-oriented speech recognition system.	(3)
2)	Explain phoneme-lattice approach to speech recognition with an example.	(3)
3)	Explain statistical pattern-recognition approach to speech recognition. Also explain the merits and demerits of this approach.	(4)
4)	Explain Linear Predictive Coding method of Spectral Analysis.	(3)
5)	List and explain the properties of distance measures for showing a high degree of mathematical tractability.	(3)
6)	Explain weighted cepstral distance and liftering.	(4)
7)	Write the autocorrelation matrix for $R_2$ , $R_3$ and $R_N$ .	(3)
8)	With a neat diagram and by using proper notations explain Hidden Markov Model.	(3)
9)	Explain Viterbi algorithm for decoding in a Hidden Markov Model.	(4)
10)	With proper notations, explain the method used to compute transition probability matrix while learning in a Hidden Markov Model.	(2)
11)	With a neat diagram explain speech recognition system based on subword units.	(4)
12)	Explain training of subword units in a HMM based speech recognition system.	(4)
13)	Explain perplexity of language model in a speech recognition system.	(3)
14)	Explain Diphone Waveform Synthesis method. Also, explain Diphone database creation.	(4)
15)	Explain Speech Synthesis system evaluation.	(3)

