Seat No.:		Enrolment No	Enrolment No	
		GUJARAT TECHNOLOGICAL UNIVERSITY ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016		
Su	bject	Code: 2720504 Date: 27/05/20	te: 27/05/2016	
Tiı	ne: 1 tructio 1. 2.	Attempt all questions.	70	
Q.1	(a) (b)	Explain Speech signal production mechanism with neat sketch. Explain speech signal processing applications.	07 07	
Q.2	(a)	Deduce wave equation for lossless tube model with necessary explanation of terms defined.	07	
	(b)	Explain effects of different losses in speech wave production.	07	
		OR		
	(b)	Explain the classification of phonemes based on manner of articulation by giving its example.	07	

(a) Define short-time autocorrelation function and explain the pitch detection method using it.
(b) Explain co-articulation and prosody. What can be interpreted from 07

spectrogram? Draw narrowband and wideband spectrogram with annotation.

OR

Q.3 (a) Explain challenges in pitch detection and list its applications.

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(b) Write and explain the algorithm for end-point detection of a given speech signal using short-time energy and short-time zero crossing rate.

Q.4 (a) What is speech coding? Explain need of speech coding. Explain how LPC can be used for speech coding.

(b) Explain spectral estimation via LPC in detail. 07

Q.4 (a) What is application of Linear Predictive Coding? Briefly explain difference between autocorrelation and covariance method of Linear prediction.

(b) Write a short note on cepstrum and complex cepstrum. 07

Q.5 (a) What is the need of STFT? Explain any one approach of STFT.
(b) Explain filtering view of short-time Fourier transform.
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OR

Q.5 (a) Derive the equation of Filter Bank Summation (FBS) constraint. 07

(b) Draw and explain characteristic system for homomorphic deconvolution. Also explain inverse of the characteristic system for homomorphic deconvolution.

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