Total No	o. of Questions : 10] SEAT No. :	
P2028	[Total No. of Pages : 2	
	[5059] - 634	
	<b>B.E.</b> ( <b>E&amp;TC</b> )	
	SPEECH AND AUDIO SIGNAL PROCESSING	
	(2012 Pattern) (Endsem)	
Time: 2½ Hours] [Max. Marks:		
Instructions to the candidates:		
1)	Q1. OR Q.2, Q.3 OR Q.4, Q.5.OR Q.6, Q.7 OR Q.8, Q.9 OR Q.10.	
2)	Right side figures indicate marks.	
3)	Assume suitable data.	
<b>Q1)</b> a)	Explain voiced and unvoiced speech signal? Explain its significance in speech processing [6]	
b)	What is Pitch of speech signal? What is formant frequencies in speech signal [4]	
	OR	
<b>Q2)</b> a)	Explain LTV model of speech signal [5]	
b)	Explain the concept of critical band and auditory systems as a filter bank? [5]	

Q3) a) What is spectrogram? What are their types? Explain its significance and applications in speech processing [5]

b) Explain Mel Scale and Bark Scale

OR

- Q4) a) How Short time energy, short time average magnitude short time average zero crossing rate is useful in speech processing?[4]
  - b) Explain the concept of Spectral entropy and Spectral Roll-off. [6]

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[5]

Q5)	a)	Explain basic principal of Linear Predictive Analysis? Explain autocorrelation method for formant analysis [8]
	b)	Explain the Cholesky Decomposition method for solution of LPC equations. [8]
		OR
<b>Q6</b> )	a)	Explain frequency domain interpretation of LP analysis? [8]
	b)	Explain Durbin algorithm in LPC analysis [8]
Q7)	a)	Explain how pitch is estimated using cesptrum analysis? [8]
	b)	Explain in detail estimation of formant and pitch parameters using cepstrum [8]
		OR
Q8)	a)	What is cepstrum? Explain in detail computation of Mel Frequency Cepstral Coefficients (MFCC). [8]
	b)	What is long term complex cepstrum? What is short term complex cepstrum? Explain the properties of the complex cepstrum. [8]
Q9)	a)	Explain in detail automatic speech recognition system with suitable example [9]
	b)	What is the difference between speaker identification and speaker verification? What are the features used for speaker recognition/verification system and how?  [9]
		OR
Q10	<b>)</b> a)	What is DTW? Explain with suitable example. [4]
	b)	What are the techniques of speech enhancement spectral subtraction method? [10]
	c)	What are the various methods used for TTS. [4]



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