

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER M. TECH. DEGREE EXAMINATION, DECEMBER 2017

Electronics & Communication Engineering
(Communication Engineering & Signal Processing)
07EC7231 Speech and Audio Signal Processing

Max. Marks: 60

Duration: 3 Hours

Answer all six questions. Part 'a' of each question is compulsory

Answer either Part 'b' or Part 'c' of each question

Q. no.	Module 1	Marks
1a	Explain the manner of articulation.	4
	Answer b or c	
b	Explain the anatomy and physiology of larynx and vocal folds.	5
c	Explain coarticulation.	5
Q. no.	Module 2	Marks
2a	Explain short-time autocorrelation function and its use in speech analysis	4
	Answer b or c	
b	Write notes on short-time average energy and zero-crossing rate.	5
c	Explain cepstral analysis. How the source and the system information are separated using cepstral analysis?	5
Q. no.	Module 3	Marks
3a	What are the perceptually important features of speech signals? Explain	4
	Answer b or c	
b	With the help of a neat diagram, explain the anatomy and physiology of outer ear, middle ear and inner ear	5
c	Explain the consonant perception.	5

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Q. no.	Module 4	Marks
4a	What are the different measures used to evaluate speech quality?	4
Answer b or c		
b	With the help of a block diagram, explain in detail about backward compatible encoding and decoding of MPEG2.	5
c	With the help of a block diagram, explain in detail about layer 3 encoding and decoding of MPEG1.	5
Q. no.	Module 5	Marks
5a	Explain various speech enhancement techniques.	5
Answer b or c		
b	Explain in detail about the filtering and adaptive noise cancellation in speech enhancement.	7
c	Explain the sinusoidal analysis/synthesis of speech signal.	7
Q. no.	Module 6	Marks
6a	Explain the parametric representation of speech signals.	5
Answer b or c		
b	Explain hidden Markov model	7
c	What are the different techniques used for speaker recognition?	7