

Total No. of Questions : 09

B.Tech.(ECE) (2011 Batch E-II)/(ETE) (2011 Onwards E-II) (Sem.-7,8)

SPEECH & IMAGE PROCESSING

Subject Code : BTEC-912

Paper ID : [A3006]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.**

SECTION-A

Q1. Answer briefly :

- a. Write any two basic features of IIR filters.
- b. Explain arithmetic and logic operations in image processing.
- c. What is the use of motion in image segmentation?
- d. Explain Block Transformation Coding for image compression.
- e. Explain the filter that is used for smoothing and sharpening in frequency domain.
- f. Explain image degradation model.
- g. What do you mean by lossy and lossless compression?
- h. Brief the model of Human speech production.
- i. What are the main elements of speech synthesizer?
- j. What are the Applications of FIR filters in speech processing?

SECTION-B

- Q2. Prove that the magnitude of determinant of a unitary transform is unity. Also show that all the eigen values of a unitary matrix have unity magnitude.
- Q3. Explain how Wiener filtering is helpful in image processing.
- Q4. Explain high and low pass filtering techniques in image processing.
- Q5. Explain the Acoustic theory of speech production in detail.
- Q6. What are the various practical considerations for the design of digital filter banks for speech processing?

SECTION-C

- Q7. Name the different transforms that are used in the compression of an image. Explain the compression algorithm used to get jpeg file format.
- Q8. Write short notes on the following :
- a. Edge Enhancement.
 - b. Thresholding.
- Q9. Give the detail of various methods of speech recognition.