Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 01

Total No. of Questions : 08

M.Tech.(ECE)(2016 Batch) (Sem.–2)
DIGITAL SPEECH & IMAGE PROCESSING
Subject Code : MTEC-202
Paper ID : [74279]

Time : 3 Hrs.   Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :
1.   **Attempt any FIVE questions out of eight questions.**
2.   **Each question carries TWENTY marks.**

Q1.   Design a high pass filter with frequency response given by :

$$H_d\left(e^{jw}\right) = \begin{cases} 0 & -\pi/4 \le w \le \pi/4 \\ e^{-j3w} & \pi/4 < |w| \le \pi \end{cases}$$

using Hanning window with N = 7. Also determine the frequency response of designed filter.

Q2.   With the help of block diagram explain the different elements of speech recognition system. Also discuss in detail the various matching algorithms used in speech recognition

Q3.   Explain the different applications of IIR and FIR filters in the area of speech and image processing.

Q4.   What do you understand by image enhancement? Explain any two methods of image enhancement.

Q5.   What do you understand by image compression? Discuss the DCT and KLT methods for image compression.

Q6.   What is the image segmentation? What are the applications of image segmentation?

Q7.   a) What are different kinds of noises may present in an image? Explain these noises based on their probability distribution.

   b) What is Wiener filtering? Where it is used in image processing? Also explain its implementation in image processing.

Q8.   Write short notes on :

   a) Image thresholding

   b) Nature of sound and harmonics

   c) Speaker recognition.