

(Time: 3 hours)

[Total Marks: 75]

Please check that you have got the correct question paper.

- N. B.: (1) All questions are compulsory.
 (2) Make suitable assumptions wherever necessary and state the assumptions made.
 (3) Answers to the same question must be written together.
 (4) Numbers to the right indicate marks.
 (5) Draw neat labeled diagrams wherever necessary.
 (6) Use of Non-programmable calculators is allowed.

SECTION – I

1.
 - a. Explain in detail about brightness adaptation and discrimination. 7
 - b. With the help of a neat figure, explain the main elements of the human eye. 6
- OR**
1.
 - a. Explain all the fundamental steps of image processing. 7
 - b. Write in detail about the “Connectivity of Pixels”. 6
2.
 - a. Explain the significance of LOG filter. Explain why it is used? 7
 - b. Explain the Illumination & Reflectance model of the image. 6
- OR**
2.
 - a. What are the basic steps needed to perform filtering in frequency domain? 7
 - b. Write in detail about Histogram Matching technique. 6
3.
 - a. What are the different approaches for describing image regions? Explain any one. 6
 - b. Define Segmentation. Explain point and edge detection. 6
- OR**
3.
 - a. Explain dilation and erosion of an image. 6
 - b. Write short note on Discrete Cosine Transform (DCT). 6

[TURN OVER]

SECTION II

4.
 - a. With help of neat diagram, explain the working of human ear. 7
 - b. Describe voice repertory dialer and automated call type recognition application of speech recognition. 6

OR

4.
 - a. Write in detail about Vowels. 7
 - b. Explain the difference in narrowband and wideband spectrogram of signal. 6

5.
 - a. Explain acoustic-phonetic vowel classifier. 6
 - b. Describe the Bank-of-Filters analysis model with diagram. 6

OR

5.
 - a. What is Hidden Markov Model? Give its applications. 6
 - b. Discuss the advantages and disadvantages of vector quantization. 6

6.
 - a. Write in detail about the Urn and Ball model. 6
 - b. Explain the characteristics of Speech Recognition applications. 6

OR

6.
 - a. Write advantage and disadvantage of source coding techniques. 6
 - b. Explain the speech production and perception mechanism in human beings. 6