No. of Printed Pages : **2**

Sl. No.

C7-R4 : DIGITAL IMAGE PROCESSING AND COMPUTER VISION

NOTE :

1. **Answer question 1 and any FOUR questions from 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time : 3 Hours **Total Marks : 100**

1. (a) Why do we need digital image processing ? Mention four fields that use digital image processing.

(b) How continuous image is converted to digital image.

(c) Define 1D and 2D Discrete Fourier transform. Find Power spectrum and Phase spectrum of each.

(d) Explain CIE standard for colour models.

(e) Give the Harr basis functions.

(f) What are the two main types of Data Compression ?

(g) What are the three types of discontinuity in digital image ? **(7x4)**

2. (a) Explain by drawing diagram fundamental components in image processing.

(b) Explain briefly any two techniques for Image Acquisition.

(c) What is histogram ? Explain histogram equalization. **(6+6+6)**

3. (a) Explain RGB Model.

(b) Discuss briefly the concept of Image Pyramid.

(c) What is Huffman coding ? Explain the technique with an example. **(6+6+6)**

4. (a) Why do we need motion estimation ? Explain briefly motion estimation types.

(b) Explain the terms Dilation and Erosion with example. **(10+8)**

5. (a) What do you mean by filters ? Give the various filters for reconstruction of images.

(b) Define the gradient of an image. What are the various values of gradient used for edge detection ?

(c) What do you mean by edged linking ? Give the steps of Hough Transform for edge linking. **(8+5+5)**

6. (a) Explain Low Pass Filters for smoothing in frequency domain.

(b) What is Gradient Vector Flow ? How the weaknesses of traditional snakes are overcome using gradient vector flow ?

(c) What is the difference between internal and external object representation ? **(6+6+6)**

7. (a) Write steps of compression method LZW.

(b) State the advantages of Sobel operator over the Laplacian Edge Operator for edge detection.

(c) Explain Median Filtering technique. **(6+6+6)**

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