

[Time: 3 Hours]

[ Marks:80]

Please check whether you have got the right question paper.

- N.B:**
1. **Question No.1 is compulsory.**
  2. **Attempt any three questions from remaining**
  3. **All questions carry equal marks**
  4. **Assume suitable data wherever necessary.**

- Q.1 Answer any four of the following:
- a) Differentiate between 8 connectivity and m connectivity. 05
  - b) Explain Dilation and Erosion in brief. 05
  - c) Justify, "Huffman coding is lossless compression technique". 05
  - d) Justify, "Butterworth low pass filter is preferred to ideal low pass filter". 05
  - e) Explain the importance of Isopreference curves. 05

- Q.2
- a) Define Image Enhancement. Explain the following enhancement operations and draw the graphs of transformation function: 10
    1. Dynamic range compression
    2. Gray level slicing10
  - b) The grey level distribution of an image is shown in table below. Perform Histogram equalization and plot histograms of original and equalized images. Explain need of histogram equalization.

Gray Level	0	1	2	3	4	5	6	7
Frequency of occurrence	100	250	100	300	150	0	0	0

- Q.3
- a) Explain the method of edge linking using Hough transform. 10
  - b) What is image segmentation? Explain with example segmentation based on similarities. 10
- Q.4
- a) Explain Discrete Wavelet Transform and its application in image processing. 10
  - b) Apply DFT algorithm to the rows and columns of the image segment shown and obtain 2D DFT. Show the Butterfly diagram. 10

6	1	3	2
1	3	2	3
1	6	4	1
1	2	1	1

**Q.P. Code :08274**

- Q.5 a) Consider an 8 pixel line of grey scale data {10, 11, 15, 13, 15, 57, 54, 51} which has been uniformly quantized with 6 bit accuracy. Construct its 3 bit IGS code. Compute the rms error for the decoded IGS code. 10
- b) What are different types of data redundancies found in a digital image? Explain in detail. 10
- Q.6 Write short notes on any three of the following:- 20
- a) Hit or Miss transformation
  - b) Chain codes
  - c) Image Sampling and Quantization
  - d) Homomorphic filtering