Q.P. Code :08274

[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   10
    transformation function:
    1. Dynamic range compression
    2. Gray level slicing

    b) The grey level distribution of an image is shown in table below. Perform Histogram equalization and   10
    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   10
    the Butterfly diagram.

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

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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

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