Q.P. Code :36277

[Time: Three Hours]   [Marks:80]

Please check whether you have got the right question paper.

N.B: 1.   Q.No.1 is compulsory.
         2.   Solve any three questions of the remaining 5 questions.
         3.   Assume any suitable data if required.

Q.1   Solve the following.   20
        a) Explain the components of Image Processing System.
        b) Prove that 'High Pass = Original – Low Pass'
        c) Explain what is mean by point operation and special operation.
        d) Explain why median filter is used to remove salt and pepper noise in an image.

Q.2   a) Draw and explain point processing operations.   10
            i)   Thresholding
            ii)   Contrast stretching
            iii)   Bit plane slicing
            iv)   Dynamic range compression.

        b) Explain fundamental steps in Image Processing.   10

Q.3   a) Generate Halfman code for given image. Calculate entropy of the same and average length of   10
            the code generated. Also calculate the compression ratio achieved compaved to standard
            binary code.

Levels	0	1	2	3	4	5	6	7
Probability	0.0.6	0.02	0.3	0.5	0.04	0.01	0.03	0.04

        b) Discuss the DPCM predictive coding and transform coding.   10

Q.4   a) Explain the local and global thresholding for image segmentation.   10

        b) Equalize the given Histogram. And draw original and equalized Histogram.   10

Gray Levels	0	1	2	3	4	5	6	7
Probability	0	200	160	80	60	0	0	0

Turn Over

Q.5 a) Derive the matrix of DCT N =4 also compute DCT of $f(x) = [1 \quad 0 \quad 1 \quad -1]$ 10

b) Compute the Hadamard and Walsh transform of Digital Image f(x, y) given by   10

0	1	2	1
1	2	3	2
2	3	4	3
1	2	3	2

Q.6 a) Explain how Hough transform is used for boundary shape detection.   10
b) Explain with block diagram 'Homomarphic filtering'.   05
c) Compare lossy and lossiess compression techniques of image.   05