

Sub: - Digital Image Processing

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B.T / VI / CBGS / DIP
QP Code : 5105

(3 Hours)

[Total Marks : 80

- N. B. : (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of remaining five questions.
(3) Assume suitable data.
(4) Assumption should be clearly stated.
(5) Use legible handwriting. Use black ballpoint pen.

1. Justify the following statement :- 20
- (a) Every Orthogonal matrix is Unitary matrix
 - (b) Zooming by interpolation is better technique than zooming by replication
 - (c) Prewitt and sobel operator perform well on noisy image than Roberts operator
 - (d) Butterworth filter is preferred over Ideal filter
 - (e) Number of computation in FFT are less as compared to DFT
2. (a) Explain the arithmetic coding with suitable example. 10
(b) Find the Huffman code for the following stream data 10
{a,a,a,a,a,a,a,b,b,b,c,c,c,c,c,d,d,d,d,d,d,d,d,d,e,e,e,e,f,f}
3. (a) For given Image find moments 10

	1	2	3	4	Y
1	3	1	2	2	→
2	2	3	2	1	
3	3	2	0	1	
4	1	0	3	2	
X	↓				

$M(0,0)$, $m(1,0)$, $m(0,1)$, $m(1,1)$, $m(2,0)$

- (b) Describe in detail how Hough transform is used for boundary shape detection 10
4. (a) Explain the Homomorphic filtering and its application 10
(b) Explain steps involved in filtering in frequency domain. Also explain the gaussian filter. 10

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5. (a) Derive the 8×8 matrix for walsh transform. Also show the walsh basis function for $N=4$ 10
(b) Explain the Sine transform 10
6. (a) Plot the histogram for the following image. Perform histogram equalization and then plot the equalized histogram and histogram equalized image. 10

1	1	3	6	4	3	1
5	6	3	4	5	5	3
3	4	3	2	4	3	5
5	5	4	1	3	2	3
1	3	4	5	6	5	4
4	6	4	1	2	2	3
2	4	6	3	2	4	5

- (b) Discuss the following image enhancement technique and give their application 10
(i) Log Transformation
(ii) zooming

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