Paper / Subject Code: 89386 / Image Processing (DLOC-II Scheme Duration: 3 hrs N.B.: (1) Question No 1 is Compulsory. (2) Attempt any THREE questions out of the remaining FIVE (3) All questions carry equal marks. (4) Assume suitable data, if required and state it clearly Q.(1) Explain the following: Dynamic Range Compression (iii) Edge Detection Operators (iii) Vector Quantization Erosion and Dilation Q.2 (a) For given 5x5 image compute the De, D4, D8 and Dm distances between pixels p and q Let V be the set of gray levels to define the similarity criteria, where $V = \{2, 3\}$ 3 (q) 0 3 1 2 0 3 2 3 3 2(p)1 (b) What are point-processing techniques for enhancement? Explain Contrast Stretching in detail. [10] [10] 2.3 (a) Explain filtering in the spatial domain. (b) Equalize the given histogram and plot the new equalized histogram. Show necessary Steps. [10] 5 3 2 Gray Level 02 08 40 40 100 No of Pixels [10] (a) Explain Homomorphic filtering with the help of a block diagram. [101] (b) Compute the Hadamard transform of the given image: 1 2 2 1 3 1 2 1 Q.5 (a) Consider an 8-pixel line of gray scale data: [12, 12, 13, 13, 10, 13, 57, 54] which has been [10] uniformly quantized with 6-bit accuracy. Construct its 3-bit IGS code. Compute the RMS error and rms signal to noise ratio for the decoded IGS code. (b) Explain Lossless predictive coding with the help of suitable encoder and decoder models. [101 (30) Q.6 Write short notes on ANY TWO of the following (a) Chain codes and Shape Number (b) Hit or - Miss Transform (c) Graph Theoretic Technique

Paper / Subject Code: 37316 / Image Processing (DLOC - II)

20/12/23

TE/Sem-VI/IT/C-scheme/IP

Duration: 3hrs			29	10)			[Max Marks: 80]			
N.B.: (1) Question No 1 is Com (2) Attempt any three que (3) Assume suitable data,	smons ou	t of	the re	emain te it c	ing fir learly	ve. ^			3	
Attempt any FOUR A Differentiate between 8 co	onnectivi	ty an	id m	' cont	nectiv	ity.	aging tech	mique	[20]	
B Explain how point proces What do you mean by po to detect them.	int, line	and e	edge	in an	image	e? Name	some tec	nniques		
D Justify/Contradict the stat E Write different properties A Apply histogram equaliza	of DCT.	Exp	lain a	any or	ie in c	letail.	Cign "		[10]	
2 A Apply histogram equalized imag	e.	1	T.	3	4					
All the state of t	6	2 3 4	2	1 2	1					
B Explain Huffman coding	algorithm			, A.					[10] [10]	
3 A Explain Gray level slicing	A Explain Gray level slicing and contrast stretching with example.									
4 A Write the steps of filtering B Apply Discrete Walsh tra	Write the steps of filtering in frequency domain. Walsh transform to the following sequence:									
$f(x)=\{1, 2, 0, 3\}$ 5 A Draw the block diagram of	$f(x)=\{1, 2, 0, 3\}$ Draw the block diagram of components of image processing and explain it.									
B Write a short note on region 6 A Give the difference betwee B Explain dilation, erosion,	Write a short note on region based segment with an example. Give the difference between chain code and shape number with an example. Give the difference between chain code and shape number with an example.									
Party and Table 19 September 19 19 19 19 19 19 19 19 19 19 19 19 19										

Examinations summer 2022

(16)

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	is not a lossless compression algorithm
Option A:	Huffman coding
Option B:	Arithmetic coding
Option C:	Dictionary based coding
Option D:	Vector quantization
2.	Operations on single pixels of a digital image are known as
Option A:	Point Operation
Option B:	Diagonal Pixel Operation
Option C:	Value Transformation
Option D:	Neighbours pixel Operation
3.	filter works best to remove salt and pepper noise.
Option A:	Low pass
Option B:	High pass
Option C:	Median
Option D:	Max
4.	In technique an entire sequence of source symbol is assigned a single code.
Option A:	Arithmetic Coding
Option B:	LZW Coding
Option C:	Huffman Coding
Option D:	Run-length Coding
5.	Three basic types of discontinuities are
Option A:	Lines, Edges, Planes
Option B:	Points, Lines, Planes
Option C:	Edges, Lines, Points

TE(IT) Sem VI 'C' Scheme IP QPCode: 94 6 The starting pixel of region growing process is called Option A: base pixel Option B: seed pixel Option C: original pixel Option D: image pixel 7. is the foremost step in Image Processing. Option A: Morphological Processing Option B: Image acquisition Option C: Segmentation Option D: Compression is not a property of 2D Discrete Fourier Transform. 8. Separability Option A: Real Option B: Periodicity Option C: Conjugate Option D: is not a region based segmentation technique. 9. Region growing Option A: Split and merge Option B: Region thinning Option C: Region splitting Option D: is a horizontal line detection mask. 10. [2-1-1;-12-1;-1-12] Option A: [12-1;-12-1;12-1] Option B:

[-1 -1 2; -1 2 -1; 2 -1 -1]

[-1 -1 -1; 2 2 2; -1 -1 -1]

Option C:

Option D:

TE (IT) Sem VI 'C' Scheme IP @Prode: 94281 3

Sel	Solve any Four out of Six. [5 Marks Each]										
A List and define types of distance measures.										5	
4.4										5	
C	AND RESIDENCE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.										
	(i) Discrete Walsh Transform (ii) Discrete Cosine Transform										
D	Draw a block diagram showing processing of Homomorphic Filtering and explain the method.										
E	Explain in brief Hough Transform.										
F	Give a DFT Transform matrix and Apply it to find transformed coefficients for $f(x) = \{2, 1, 3, 1\}$.										
Soh	olve any Two Questions out of Three. [10 Marks Each]										
A	Perform histogram equalization for the following pixel distribution:										
	Gray Level	0	1,	2	3	4	5	6	7		
	Frequency	10	0	4	15	25	6	0	4		
	Draw original histogram and equalized histogram.										
В	Explain following morphological methods with example:										
C											
Solv	olve any Two Questions out of Three. [10 Marks Each]										
A	The state of the s										
Obtain the four directional Chain Code and Shape number representation using 4-directional with the given starting point as shown in the image with dark filled cell as pixel is the boundary of the object. B									10		
	B Solv A Solv A	A List and define B Draw the difference C Show transfor (i) Discrete W D Draw a block the method. E Explain in brown a series of the method. E Explain in brown a series of the method. F Give a DFT of the first of	A List and define type B Draw the different C Show transform ma (i) Discrete Walsh D Draw a block diagrethe method. E Explain in brief He F Give a DFT Transform f(x) = {2, 1, 3, 1}. Solve any Two Question A Perform histogram Gray Level 0 Frequency 10 Draw original histogram (i) Erosion C Illustrate Arithmetic Solve any Two Question A List all Point Proces Obtain the four diagram of the diagram of the four diagram of the	A List and define types of a B Draw the different steps C Show transform matrix for (i) Discrete Walsh Transform of the method. E Explain in brief Hough F Give a DFT Transform of f(x) = {2, 1, 3, 1}. Solve any Two Questions out A Perform histogram equals Gray Level 0 1 Frequency 10 0 Draw original histogram B Explain following morph (i) Erosion (ii) C Illustrate Arithmetic Cool Solve any Two Questions out A List all Point Processing Obtain the four direction 4-directional with the give cell as pixel is the boundary of the processing of the proc	A List and define types of distance of B Draw the different steps in digital C Show transform matrix for N=4 at (i) Discrete Walsh Transform D Draw a block diagram showing prothe method. E Explain in brief Hough Transform f(x) = {2, 1, 3, 1}. Solve any Two Questions out of Three A Perform histogram equalization for Gray Level 0 1 2 Frequency 10 0 4 Draw original histogram and equal Draw original histogram and equal (i) Erosion (ii) Dilation C Illustrate Arithmetic Coding and Solve any Two Questions out of Three A List all Point Processing Technique Obtain the four directional Chair 4-directional with the given starticell as pixel is the boundary of the Colon of the Co	A List and define types of distance measures B Draw the different steps in digital image processing the method. E Explain in brief Hough Transform. F Give a DFT Transform matrix and Apply it f(x) = {2, 1, 3, 1}. Solve any Two Questions out of Three. A Perform histogram equalization for the following morphological methods (i) Erosion (ii) Dilation C Illustrate Arithmetic Coding and Decoding Solve any Two Questions out of Three. A List all Point Processing Techniques and Obtain the four directional Chain Code and Apply it for the four directional Chain Code and Addirectional with the given starting point cell as pixel is the boundary of the object.	A List and define types of distance measures. B Draw the different steps in digital image processing of Show transform matrix for N=4 and Give three pro (i) Discrete Walsh Transform (ii) Disc Draw a block diagram showing processing of Homethod. E Explain in brief Hough Transform. F Give a DFT Transform matrix and Apply it to find if f(x) = {2, 1, 3, 1}. Solve any Two Questions out of Three. A Perform histogram equalization for the following processing of Homethods and Frequency 10 0 4 15 25 Draw original histogram and equalized histogram. B Explain following morphological methods with exaction (ii) Erosion (ii) Dilation C Illustrate Arithmetic Coding and Decoding. Solve any Two Questions out of Three. A List all Point Processing Techniques and explain Obtain the four directional Chain Code and Shaped-directional with the given starting point as show cell as pixel is the boundary of the object.	A List and define types of distance measures. B Draw the different steps in digital image processing. C Show transform matrix for N=4 and Give three properties e (i) Discrete Walsh Transform (ii) Discrete Cos D Draw a block diagram showing processing of Homomorphi the method. E Explain in brief Hough Transform. F Give a DFT Transform matrix and Apply it to find transform f(x) = {2, 1, 3, 1}. Solve any Two Questions out of Three. A Perform histogram equalization for the following pixel distriction for the following morphological methods with example: (i) Erosion (ii) Dilation C Illustrate Arithmetic Coding and Decoding. Solve any Two Questions out of Three. A List all Point Processing Techniques and explain any two Obtain the four directional Chain Code and Shape number 4-directional with the given starting point as shown in the cell as pixel is the boundary of the object.	A List and define types of distance measures. B Draw the different steps in digital image processing. C Show transform matrix for N=4 and Give three properties each: (i) Discrete Walsh Transform (ii) Discrete Cosine Transform bright the method. E Explain in brief Hough Transform. F Give a DFT Transform matrix and Apply it to find transformed coeff(x) = {2, 1, 3, 1}. Solve any Two Questions out of Three. [10 M] A Perform histogram equalization for the following pixel distribution: Gray Level 0 1 2 3 4 5 6 10 Draw original histogram and equalized histogram. B Explain following morphological methods with example: (i) Erosion (ii) Dilation C Illustrate Arithmetic Coding and Decoding. Solve any Two Questions out of Three. A List all Point Processing Techniques and explain any two with example defined and Shape number representations are pixel is the boundary of the object.	Solve any Four out of Six. [5 Marks Each]	

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			List all region	based	segme	ntation	techn	iques. A	pply regi	ion based	segmen	tation	10
			on a 3-bit image of size 4x4. Assume Threshold = 3, a pixel value 7 as starting point, and use 4-way connectivity.										
				1	0	2	0						
		C		0	0	6	6	2					
				5	5	5	5						
				7	6	6	0						
								'					

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