FirstRanker.com www.FirstRanker.com

www.FirstRanker.com





IV B.Tech I Semester Regular/Supplementary Examinations, October/November - 2017 **DIGITAL IMAGE PROCESSING**

(Common to Electronics and Computer Engineering, Electronics and Communication **Engineering and Electronics and Instrumentation Engineering**)

Time: 3 hours

Code No: **RT41043**

Firstranker's choice

Max. Marks: 70

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any THREE questions from Part-B *****

PART-A (22 Marks)

1.	a)	Define D_4 and D_8 distances.	[3]
	b)	What are the advantages of filtering in frequency domain?	[4]
	c)	How to estimate the degradation function by experimentation?	[4]
	d)	Define brightness, hue and saturation.	[3]
	e)	Write short notes on spatial redundancy.	[4]
	f)	Write short notes on morphological gradient.	[4]

<u>**PART-B**</u> (3x16 = 48 Marks)

2.	a)	What is meant by image interpolation? Discuss about various interpolation methods.	[8]
	b)	What is the need of image transform? List out various transform used in image	[~]
	,	processing.	[8]
3.	a)	With an example, explain the concept of histogram equalization.	[8]
	b)	State 2D sampling theorem and explain about aliasing in images.	[8]
		N O	
4.	a)	Explain about noise reduction in an image using band reject and band pass filters.	[8]
	b)	Explain the concept of minimum mean square error filtering.	[8]
5.	a)	Explain about RGB color model and write its applications.	[8]
	b)	Describe about histogram processing in color images.	[8]
6.	a)	Draw the diagram of two band subband coding and decoding system, and explain it.	[8]
	b)	With an example, explain about arithmetic coding.	[8]
7.	a)	Discuss about opening and closing for gray scale images.	[8]
	b)	Explain the detection of isolated points in an image.	[8]





Code No: RT41043



Set No. 2

IV B.Tech I Semester Regular/Supplementary Examinations, October/November - 2017 DIGITAL IMAGE PROCESSING

(Common to Electronics and Computer Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any THREE questions from Part-B *****

PART-A (22 Marks)

		$\underline{\mathbf{FAKI}} = \underline{\mathbf{A}} (22 Marks)$	
1.	a)	What is meant by spatial resolution and explain its significance.	[4]
	b)	Define Fourier spectrum and Phase angle of 2D-DFT.	[3]
	c)	Write short notes on Max and Min filters.	[4]
	d)	Write short notes on chromaticity and tristimulus values.	[4]
	e)	Explain about subjective fidelity criteria.	[3]
	f)	Explain the duality of erosion and dilation operations.	[4]
		<u>PART-B</u> $(3x16 = 48 Marks)$	
2.	a)	Explain the following terms:	
		(i) Adjacency (ii) Connectivity (iii) Regions (iv) Boundaries	[8]
	b)	Obtain the Haar transformation matrix for $N = 8$.	[8]
3.	a)	Explain the use of histogram statistics for image enhancement.	[8]
	b)	Prove the validity of the discrete convolution theorem of two variables.	[8]
4.	a)	What is an adaptive median filter? Explain its use for noise reduction in an	
		image.	[8]
	b)	With an example, explain the concept of image reconstruction from back	
		projections.	[8]
5.	a)	Discuss about CMY and CMYK color models.	[8]
	b)	Discuss about noise in color images.	[8]
	,		
6.	a)	Explain the concept of wavelet packets and write its advantages.	[8]
	b)	Draw the functional block diagram of general image compression system and	
		explain it.	[8]
7.	a)	Explain the following morphological algorithms:	
		(i) Boundary extraction (ii) Hole filling	[8]
	b)	Define image gradient and explain its use in edge detection.	[8]

1 of 1



Code No: RT41043



IV B.Tech I Semester Regular/Supplementary Examinations, October/November - 2017 **DIGITAL IMAGE PROCESSING**

(Common to Electronics and Computer Engineering, Electronics and Communication **Engineering and Electronics and Instrumentation Engineering**)

Time: 3 hours

Max. Marks: 70

[8]

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any THREE questions from Part-B *****

PART-A (22 Marks)

1. a)

b)

a)		
u)	Compute the Haar transform of the 2 X 2 image $F = \begin{bmatrix} 5 & -1 \\ 6 & 2 \end{bmatrix}$	[4]
b)	What is Log Transformation and write its use in image processing.	[3]
c)	Write the expression for contraharmonic mean filter and explain its use in image	
	restoration.	[4]
d)	What is the purpose of color model and list out some color models.	[4]
e)	What is image compression? Why it is needed?	[4]
f)	List out different masks used to compute the gradient.	[3]

<u>PART-B</u> (3x16 = 48 Marks)

2.	a)	Explain the basic concepts of sampling and quantization in the generation of	
		digital image.	[8]
	b)	Discuss about KL Transform and write its applications in image processing.	[8]

a) Determine the convolution and correlation between the following images: 3.

		Γ	0	0	0	0		
			0	0	0	0	0 1 2 3	
		f(x, y) =	0	0	1	0	0 and $g(x, y) = \begin{vmatrix} 4 & 5 & 6 \end{vmatrix}$	
			0	0	0	0	0 7 8 9	
		L	0	0	0	0	0	[8]
	b)	Explain the	e fo	llo	win	g fil	ters:	[0]
	,	(i) Band rej	ject	t an	d B	and	pass filters (ii) Notch filters	[8]
4.	a)	What are the	he	diff	ere	nt a	pproaches to estimate the noise parameters in an image?	
		Explain.						[8]
	b)	State and e	xpl	ain	the	Fo	urier-Slice Theorem.	[8]
5.	a)	Discuss the	e co	once	ept	of c	onverting colors from RGB to HSI.	[8]

With necessary equations, explain about color edge detection. b) [8] What are the various Multiresolution analysis requirements? Explain. 6. [8] a)

What is meant by block transform coding? Explain.

Explain about morphological hit-or-miss transform. [8] 7. a) Discuss about edge linking using local processing. [8] b)



www.FirstRanker.com

Code No: RT41043





IV B.Tech I Semester Regular/Supplementary Examinations, October/November - 2017 DIGITAL IMAGE PROCESSING

(Common to Electronics and Computer Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any THREE questions from Part-B *****

PART-A (22 Marks)

1.	a)	Define Walsh Transform and write its properties.	[4]
	b)	What is meant by gamma correction? Why it is needed?	[3]
	c)	Write the difference between image restoration and image enhancement.	[4]
	d)	Write short notes on RGB to CMY conversion.	[4]
	e)	Write the difference between Fourier transform and wavelet transform.	[4]
	f)	Explain the effect of noise in edge detection.	[3]
		PART–B $(3x16 = 48 Marks)$	
2.	a)	Explain about linear and nonlinear operations used in image processing.	[8]
	b)	State and Prove the translation and rotation properties of 2D-DFT.	[8]
3.	a)	Explain the concept of weighted average filter.	[8]
	b)	With necessary equations, explain the concept of homomorphic filtering.	[8]
4.	a)	List out some important noise probability density functions used in image	

processing and sketch their plots.	[8]
b) Discuss about Radon Transform and write its applications.	[8]

5.	a)	Explain about intensity slicing and write its applications.	[8]
	b)	Discuss about segmentation in RGB vector space.	[8]
6.	a)	Explain about wavelet transform in two dimensions.	[8]
	b)	Draw the block diagram of lossless predictive coding model and explain it.	[8]

7. a) Explain the following morphological operations:

	(1)	Erosion	
	(ii)	Dilation	[8]
b)	Expl	ain the basics of intensity thresholding in image segmentation.	[8]

1 of 1