Code No: **R41043** **R10** **Set No. 1**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

DIGITAL IMAGE PROCESSING

(Common to Electronics & Communication Engineering and Electronics & Computer Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1 Describe neatly all the components of a general purpose image processing system. What are the fundamental steps in digital image processing? [15]

2 a) Write in detail about histogram processing. [7]

b) Describe how homomorphic filtering is used to separate illumination and reflectance component? [8]

3 a) Explain about the basic of filtering in the frequency domain. [8]

b) Explain about Selective Filtering. [7]

4 Illustrate the different causes of image degradation. [15]

5 a) Explain about Noise in Color Images. [6]

b) Consider the following RGB triplets. Convert each triplet to CMY and YIQ
i) (1 1 0) ii) (1 1 1) iii). (1 0 1) [9]

6 a) Describe about wavelet packets. [7]

b) How an image is compressed using JPEG image compression standard? [8]

7 a) Define the opening and closing. List the properties of opening and closing operations [8]

b) Explain some of the basic morphological algorithms. [7]

8 a) Explain with different steps, the working of region based segmentation algorithm. [8]

b) Describe Watershed segmentation Algorithm. [7]

Code No: **R41043** **R10** **Set No. 2**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

DIGITAL IMAGE PROCESSING

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Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1	a)	Write the properties of KL transform.	[4]
	b)	Write the properties of cosine transform.	[4]
	c)	List out the properties of 2D Fourier transform.	[4]
	d)	Discuss the Properties of Fourier transform.	[3]
2		How do you enhance a monochrome image by histogram? i) Equalization ii) Specification technique how do you assess the qualities of enhancement?	[15]
3	a)	List Some Properties of the 2-D Discrete Fourier Transform.	[7]
	b)	Explain about the DFT of one variable and two variables.	[8]
4	a)	Write notes on Inverse filtering.	[7]
	b)	Explain the function of Wiener filter for image restoration in presence of additive noise.	[8]
5	a)	Explain in detail about how the color models are converted to each other.	[7]
	b)	Discuss about color quantization and explain about its various types.	[8]
6	a)	Explain the need for image compression. How run length encoding approach is used for compression? Is it lossy? Justify.	[9]
	b)	Write short notes on: i) Arithmetic coding. ii) Vector quantization. iii) JPEG standards.	[6]
7	a)	Explain about Plane to plane transformation.	[7]
	b)	Write about HIT-OR-MISS transform.	[8]
8		Explain the concept of Thresholding in image segmentation and discuss its merits and limitations.	[15]

Code No: **R41043** **R10** **Set No. 3**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

DIGITAL IMAGE PROCESSING

(Common to Electronics & Communication Engineering and Electronics & Computer Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1 a) Distinguish between scalar and vector quantization. [8]
b) Give two properties of SVD Transformation. [7]

2 Describe Histogram equalization. Obtain Histogram equalization for the following image segment of size 5X5? Write the inference on image segment before and after equalization.

20 20 20 18 16
15 15 16 18 15
15 15 19 15 17
16 17 19 18 16
20 18 17 20 15 (5X5) matrix [15]

3 a) Discuss smoothing filters used for reducing noise and blurring in an image. [5]
b) Explain how Image Smoothing is done using Selective Filtering. [10]

4 a) Explain the concept of geometric transformation for image restoration. [8]
b) How Wiener filtering is helpful to reduce the mean square error? [7]

5 a) What is color image processing? Explain in detail the concepts underlying full color image processing [11]
b) Define Smoothing and Sharpening. [4]

6 Discuss various image compression techniques for reducing the size of images. [15]

7 a) Discuss about Grey-scale morphology. [8]
b) Write a short notes on Geometric Transformation. [7]

8 Discuss the principle of image segmentation by watershed transformation and explain its drawbacks. [15]

Code No: **R41043** **R10** **Set No. 4**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

DIGITAL IMAGE PROCESSING

(Common to Electronics & Communication Engineering and Electronics & Computer Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

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1 a) Explain the basic concepts of sampling and quantization with neat sketch. [8]

b) Find DCT Transformation and its inverse for the given 2x2 image [3 6; 6 4]. [7]

2 Explain about Adaptive, local noise reduction filter. [15]

3 a) Explain how Image Smoothing is done using Frequency Domain Filters. [7]

b) Explain the following properties of 2D-Fourier Transform:
   i) Distributives and scaling
   ii) Rotation [8]

4 Describe Constrained Least Square Filtering for image restoration and derive its transfer function. [15]

5 What is noise? How does it effect the efficiency of image segmentation algorithm? Name various types of techniques for filtering noise in image. [15]

6 a) Write about Huffman Coding. [7]

b) Write about Haar Wavelet transform. [8]

7 a) Discuss how to construct dams using morphological operations? [7]

b) Write short notes on Erosion and Dilation. [8]

8 Discuss Image Segmentation based on various thresholding techniques. [15]