B.E. Eighth Semester (Electronics & Telecommu. Engineering) (CGS)

10643 : Professional Elective-II : Digital Image Processing

8 XT 04

P. Pages : 2 | **AU - 3000**

Time : Three Hours | Max. Marks : 80

Notes : 1. Assume suitable data wherever necessary.
2. Illustrate your answer necessary with the help of neat sketches.
3. Use of non-programmable calculator is permitted.
4. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) Based on the pixels relationship explain in detail the distance measures:- **10**
a) Euclidean distance.
b) City block distance.
c) Chessboard distance.

b) What do you meant by sampling and quantization in digital Image processing. **4**

OR

2. a) Explain in detail Human Visual system with the photopic and scotopic vision. Also discuss distribution of rods and cones in the human eye retina. **10**

b) Discuss in brief the spatial Resolution and Gray level resolution in an image. **4**

3. a) Explain the various properties of two dimentional Discrete. Fourier Transform in detail. **10**

b) What do you by sequence in Hadamard transform Explain in brief. **3**

OR

4. With the help of suitable examples explain the meaning and significance of the following matrices in image processing. **13**
i) Toeplitz and circulant matrices.
ii) Orthogonal and unitary Matrices.
iii) Block matrices and Kronecker product.

5. a) Discuss in detail the homomorphic filtering in an image. Explain with suitable example. **8**

b) Explain the processing of Histogram equalization in brief for an image. **5**

OR

6. a) State and explain the point processing operations used in the image enhancement in spatial domain. What do you meant by n^{th} power operation in an image. **8**

b) Explain in brief median filtering in image enhancement. Also discuss the median filtering is suitable for which type of noise. **5**

SECTION – B

7.	a)	What is the necessity of image restoration? What are the methods and how the noise in an image identified? Explain in detail.	9
	b)	Explain in brief the order – statistics filter that is useful in situations involving multiple types of noise.	5

OR

8.	a)	Explain in detail any four morphological operations perform on an image. Also discuss structuring elements used.	9
	b)	Discuss in brief Weiner filtering in an image. Give its significance.	5
9.	a)	How many unique Huffman codes are there for a three symbol source? Construct them and explain in detail.	8
	b)	Discuss in brief basic data-redundancies in digital image compression?	5

OR

10.	a)	Can variable length coding procedure be used to compress a histogram equalized image with '2^n' gray levels? Explain in detail with justification.	8
	b)	Discuss the lossy and predictive coding model for image compression in brief.	5
11.	a)	What is an 'edge' in an image? On which mathematical operations are the two basic approaches for edge detection based on? Explain in brief.	7
	b)	Distinguish between 'local' and 'global' thresholding techniques for image segmentation. Discuss in brief.	6

OR

12.	a)	Describe the region growing technique for image segmentation and mention the problems associated with it.	7
	b)	What do you understand by thresholding of an image? Explain in brief.	6

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