

5812-07.

MIE (Comp) sem-II A.T.K.T

Date 22/12/2023

BB-7467

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Image Processing  
(3 Hours)

(15)

[ Total Marks : 100

- 1) Question No. 1 is Compulsory.
- 2) Attempt any four of remaining six questions.
- 3) Assume any suitable data if necessary and clearly state it.
- 4) Figures to right indicates full marks

- Q. 1) Justify the following statement. 20
- a) Discrete Cosine Transform is energy preserving transform
  - b) Orthogonal Transforms are useful tool for image processing.
  - c) Walsh and Hadamard Transform are used for data compression, where low computing resources are available.
  - d) The mean filter is a linear filter but median filter is not.
- Q. 2 a) Explain fundamental steps in Digital Image Processing. 10
- b) Explain with suitable example different distance measures. 10
- Q. 3 a) Explain in detail Filtering in the Frequency Domain. 10
- b) Gray level histogram of an image is given below 10 muadda.com

Level	0	1	2	3	4	5	6	7
Frequency	400	700	1350	2500	3000	1500	550	0

Compute the gray level histogram of the output image obtained by enhancing the input by the histogram equalization technique.

- Q. 4 a) Find the set of code words and average word length using Huffman coding scheme for the set of input gray levels with probabilities as given below 10

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Symbol	S1	S2	S3	S4	S5	S6	S7	S8
Probability	0.02	0.15	0.03	0.15	0.05	0.20	0.10	0.30

Compute the lowest possible average bits per gray level required to represent this data.

- b) Explain in detail subjective and objective fidelity criteria for decompressed image assessment. 10

- 5) a) Explain in detail a general compression system model. 10  
b) Describe the region growing technique for image segmentation and mention the problems associated with it. 10  
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- 6) a) What is Edge Linking? Explain in detail how Hough Transform is used for Edge Linking. 10  
b) Discuss in detail various Line Detection algorithms. 10
- 7) Write a Short Notes on (Any Four) 20  
a) Image Restoration  
b) Uniform and Non-Uniform Sampling  
c) Homomorphic Filtering.  
d) Wiener Filter  
e) Erosion and Dilation Operations

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