

**FACULTY OF INFORMATICS**

M.C.A. (2 Years Course) III- Semester (CBCS) (Backlog) Examination, October/ November 2023

**Subject: Image Processing (E-II)****Time: 3 Hours****Max. Marks: 70****Note: I. Answer one question from each unit. All questions carry equal marks.****II. Missing data, if any, may be suitably assumed.****Unit – I**

1. Explain the following terms as applicable to Image Processing with necessary graph.
  - a) Brightness Adaptation
  - b) WEBER Ratio
  - c) Machbands

**(OR)**
2. Explain the principle of Sampling and Quantizations. Discuss its effect on increasing
  - a) Sampling Frequency.
  - b) Quantization levels of image.

**Unit – II**

3. Obtain KL Transform basis for the following Matrix
  - a)  $X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$
  - b) State & Prove Convolution Property and Periodicity Property of 2D DFT.

**(OR)**
4. a) With the help of a block diagram. Explain DCT based jpeg compression standards.  
 b) Compare the transforms DCT and KLT as a choice for Image Compression applications?

**Unit – III**

5. a) Explain any Two methods for Linking the Edge Pixels to form a boundary of an object.  
 b) Explain with examples Morphological Operations Dilation and Erosion?  

**(OR)**
6. a) Explain different Spatial Filtering Techniques used in images.  
 b) Distinguish them with appropriate masks.  
 c) Define Homomorphic Filtering with necessary equations.

**Unit – IV**

7. Explain the basic model of Image Restoration process also, with necessary equation, explain the most common PDF's in an Image Processing?  

**(OR)**
8. Derive a WienerFilter for Image Restoration using minimum means square approach? Give the condition in which WienerFilter reduces to an InverseFilter.

**Unit – V**

9. a) What does Radon Transform mean, where it is used?  
 b) What is Radon Transformation in Seismic?  

**(OR)**
10. a) How to perform Image Reconstruction using Radon Transform?  
 b) Explain Image Reconstruction by Filtered Back Projections.