

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST - 2 EXAMINATIONS - 2022

B.Tech-VII Semester (ECE)

COURSE CODE (CREDITS): 19B1WEC735(3)

MAX. MARKS: 25

COURSE NAME: Forensic Image Processing

COURSE INSTRUCTORS: Dr. Nafis U Khan

MAX. TIME: 1 Hour and 30 Minutes

*Note: All questions are compulsory. Marks are indicated against each question in square brackets.*

- Q1. Distinguish between image enhancement and image restoration. Give an example for each. CO3 [3]
- Q2. Explain the concept of anisotropic diffusion in edge preserving smoothing of images. CO3 [3]
- Q3. Explain how digital image processing techniques are useful in forensic analysis of fabricated documents. CO4 [3]
- Q4. Explain K - means clustering algorithm for image segmentation. Segment the data sets : { (4,6), (5,10), (8,9), (3,9), (2,8), (8,4), (5,1), (4,2)} into two clusters based on K- means algorithm with initial sets as (3, 9) and (8, 4). CO4 [5]
- Q5. What is Singular Value Decomposition (SVD)? Explain how each factor in SVD is calculated for image compression? CO4 [3]
- Q6. How dimensionality reduction is achieved using Principal Component Analysis? Compute eigenvalues and eigenvectors of the following matrix and explain how do we select the best number of principal components for a given image dataset.
- $$A = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} \quad \text{CO4 [4]}$$
- Q7. List out and explain various image quality assessment parameters used in forensic image analysis. CO4 [4]