JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST - 3 EXAMINATION-2022

B.Tech - VII Semester (ECE)

COURSE CODE (CREDITS): 19B1WEC735 (3)

COURSE NAME: FORENSIC IMAGE PROCESSING

COURSE INSTRUCTORS: DR. NAFIS U. KHAN

MAX. MARKS: 35

MAX. TIME: 2 Hours

Note: All questions are compulsory. Marks are indicated against each question in square brackets. Assume the data wherever necessary.

Q1. State and explain image sensing and acquisition process in detail. Explain how aliasing errors can be eliminated?
CO1[5]

Q2. Distinguish between smoothing and sharpening filters. Give the appropriate masks for any one smoothing and sharpening filters.
CO1[5]

Q3. Explain edge detection in digital images using Gradient and Laplacian operators. CO2[5]

Q4. Explain various statistical techniques used in image forensics.
CO4[5]

Q5. Differentiate between the followings:
   a) Pixel based forensics and format based forensics
   b) Image enhancement and image restoration
CO4[5]

Q6.
   a) Explain how Singular Value Decomposition (SVD) can be used for image compression?
   b) Segment the data sets (3,8), (2,9), (4,6), (3,7), (1,8), (7,4), (3,6) and (5,2) into two clusters based on K means algorithm with initial sets as (2, 9) and (7, 4).
CO3[5]

Q7.
   a) Explain how motion estimation of video frames using differential operators is effective in video forensics.
   b) Perform histogram equalization of an image shown below:
CO2[5]

$$f(m,n) = \begin{bmatrix} 3 & 2 & 4 \\ 7 & 7 & 8 \\ 3 & 1 & 2 \end{bmatrix}$$