

***Assignment-2                      Unit-2: Image Transform & Image Enhancement***

1. Find the DST of  $f(x)=\{11, 12, 4, 45\}$ . (CO6-Apply)
2. Determine the DFT of the following image and also find the IDFT of the output image. (CO6-Apply)

$$\begin{bmatrix} 0 & 1 & 2 & 1 \\ 1 & 2 & 3 & 2 \\ 2 & 3 & 4 & 3 \\ 1 & 2 & 3 & 2 \end{bmatrix}$$

3. Obtain the digital negative, BP2 (Bit-Plane 2) and BP0 of the following 4X4, 8 Bits per pixel image. (CO2-Apply)

$$\begin{bmatrix} 120 & 255 & 105 & 152 \\ 150 & 75 & 120 & 100 \\ 10 & 100 & 150 & 10 \\ 250 & 80 & 100 & 210 \end{bmatrix}$$

4. Calculate correlation and convolution of given 2D filter  $w$  with 2D discrete unit impulse function. (CO2-Apply)

$$w(x, y) = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \quad f(x, y) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

5. What do you mean by histogram and histogram equalization of an image? Equalize the given histogram. And also see what happens when you equalize it twice? (CO2-Apply)

|                  |     |    |    |    |   |   |   |   |
|------------------|-----|----|----|----|---|---|---|---|
| Gray level       | 0   | 1  | 2  | 3  | 4 | 5 | 6 | 7 |
| Number of pixels | 100 | 90 | 50 | 20 | 0 | 0 | 0 | 0 |

6. Find the kronecker product of  $A \times B$ , also find  $B \times A$ . (CO6-Apply)

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 3 & 1 \\ 2 & 5 \end{bmatrix}$$

7. Obtain the transformation matrix for Walsh Hadamad and discrete cosine transform. (CO6-Apply)
8. Find the slant transform of the given signal  $x(n)=[1 \ 2 \ 2 \ 1]$ . (CO6-Apply)