

(3 Hours)

[Total Marks:80]

NB.

- (1) Question No.1 is compulsory.
- (2) Attempt any three questions from remaining.
- (3) All questions carry equal marks.
- (4) Assume suitable data wherever necessary

Q.1 Answer any four of the following:

- a) Why DCT is preferred for image compression? (5)
- b) Can two different images have the same histogram? Justify. (5)
- c) What do you mean by aliasing in image sampling? (5)
- d) Explain any one color model to represent an image. (5)
- e) Why is the sum of coefficients of a high pass filter mask zero? (5)

Q.2 a) The histogram of a digital image with 3 bits per pixel is given below: (10)

Grey Level	0	1	2	3	4	5	6	7
Number of pixels	70	100	40	60	0	80	10	40

Perform histogram equalization and plot the histogram of the original and equalized image.

- b) Explain the following image enhancement techniques in spatial domain with the help of transformation graphs. (10)
  - i) Contrast stretching
  - ii) Grey level slicing

- Q.3 a) What is image segmentation? Explain with example Region based segmentation. (10)
- b) With the help of suitable examples ,explain the following morphological operations: (10)
  - i)Dilation
  - ii) Erosion

Q.4 a) Check whether the DFT matrix is unitary or not and calculate the 2D-DFT of the given image segment using matrix multiplication method. (10)

0	1	2	1
1	2	3	2
2	3	4	3
1	2	3	2

- b) Explain Discrete Wavelet Transform and its application in image processing. (10)

- Q.5 a) Explain in detail Predictive coding technique. (10)
- b) Explain Homomorphic filtering with the help of neat block diagram. (10)

Q.6 Write short notes on any four of the following (20)

- a) Fourier Descriptors
- b) Data redundancies in digital image.
- c) Bit plane Slicing
- d) Image file formats.
- e) Hit or Miss Transformation