

T.E. (IT) (Sem - V) (CB)

Time: 3 Hrs

Marks: 80

N.B.

- 1) Question No. 1 is compulsory
- 2) Solve any three questions out of the remaining five questions.
- 3) Assume suitable wherever necessary, justify the same

- 1 a) Describe the basic elements of Image Processing System. (5)
- b) Describe image sampling and quantization with the help of an example. (5)
- c) For below given image, perform digital negative and thresholding with $T=4$. (5)

Given: 3-bit 4*4 size image

1	2	3	0
2	4	6	7
5	2	4	3
3	2	6	1

- d) Show that High Pass = Original – Low Pass (5)
- 2 a) Calculate the direction of the edge at the center point of the image: (10)

I =

50	60	70
5	50	80
7	9	50

- b) Explain region based segmentation. Describe the different ways in which region based segmentation can be carried out. (10)
- 3 a) Perform Histogram Equalization. (10)

Grey Level	0	1	2	3	4	5	6	7
No. of Pixels	123	78	281	417	639	1054	816	688

- b) Explain ideal Low Pass Frequency domain filter in detail. (10)
- 4 a) Define global thresholding? Write an algorithm to calculate global threshold. (10)
- b) Calculate the coding efficiency of Huffman Code for the following symbols: (10)

Symbol	Probability
A1	0.9
A2	0.06
A3	0.02
A4	0.02

- 5 a) Explain global processing using Hough transform. (10)
b) What is biometric authentication? State requirements of image processing in biometric? (10)
- 6 Write Short note: (Any 4) (20)
a) HIT or MISS Transformations
b) Smoothing and Sharpening filters in spatial domain
c) Edge Detection Masks/Filters
d) Image Compression Model
e) Properties of DFT
