

TE (Biomed) / sem-VI / Choice Based  
Paper / Subject Code: 88823 / Digital Image Processing

22/05/19

[Time: 3 Hours]

[Marks:80]

Please check whether you have got the right question paper

- N.B: 1. Questions No .1. Is compulsory.  
2. Attempt any three of the remaining five questions.

- Q.1
- Explain image file formats. 05
  - Explain how chain codes can be made invariant to rotation. 05
  - Explain compass operator. 05
  - Differentiate between Lossless and lossy compression technique. 05

- Q.2 a) Histogram of an image is give below perform histogram equalization. Draw Original & modified Histogram. 10

Gray level	0	1	2	3	4	5	6	7
No. of. pixels	8	12	10	2	12	14	6	2

- b) Derive the Hadamard transform matrix  $H(8)$ . Check if  $H(8)$  is orthogonal. Draw the basis function for  $H(8)$ . 10

- Q.3 a) With the help of a neat block diagram explain basic fileting in the frequency domain. Give the reason for shifting the origin. 10
- b) What do you mean by Region based segmentation? Explain Region Growing and Region splitting. 10

- Q.4 a) Explain the following for Morphological operations. 10
- Erosion
  - Closing

- b) Find the Huffman code for the following. 10

A1	A2	A3	A4	A5	A6	A7	A8
0.05	0.2	0.6	0.06	0.02	0.02	0.01	0.04

- Q.5 a) Explain homomorphic filter with the help of a block diagram. 10
- b) Explain prewitt and sobel operators. How are these operators implemented? Explain why these operators perform well in case of a noisy image. 10

Q.6 Write short notes on (any four)

- a) Non uniform sampling
- b) Bit plane slicing
- c) DCT
- d) RLE
- e) Hit/Miss Transform

20  
05  
05  
05  
05  
05