

B. Tech. Sem - VIII (Computer Engg.) (2014 COURSE) (CBCS) :
SUMMER - 2019

SUBJECT: IMAGE PROCESSING AND PATTERN RECOGNITIONS

Day: Saturday
Date: 25/05/2019

S-2019-2886

Time: 02.30 PM TO 05.30 PM
Max Marks : 60

N.B. :

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat diagrams wherever necessary.
- 4) Use of nonprogrammable calculator is allowed.

Q.1 a) Explain in detail histogram processing with an example **(05)**

b) State Sampling theorem. Explain about Image sampling and quantization process. **(05)**

OR

Q.1 a) How do you measure distance between two pixels in an image? Explain any one method. **(05)**

b) What is the connectivity? Explain connectivity concept for gray scale image **(05)**

Q.2 a) Noisy image corrupted by Salt and Pepper noise, is filtered by
i) Mean filter ii) Median filter **(05)**
Compare the results.

b) Explain image filtering in frequency domain. **(05)**

OR

Q.2 a) What are different types of edges? Explain with suitable examples response of First order & second order derivative filter **(10)**

Q.3 a) Obtain the Huffman code for the word 'COMMITTEE' **(05)**

b) What is LZW coding? Explain general use of LZW? **(05)**

OR

Q.3 a) What are the three stages of Canny edge detector? Briefly explain each phase **(05)**

b) Explore Line and edge detection methods in image compression **(05)**

Q.4 a) Find out the dilation and erosion on following matrices **(05)**

$$A = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix} \quad B = \begin{bmatrix} \textcircled{1} & 1 \\ 1 & 1 \end{bmatrix}$$

b) Find out Hit or miss transformation from the following matrices **(05)**

$$A = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix} \quad B = \begin{bmatrix} 1 & \textcircled{1} \\ 1 & 1 \end{bmatrix}$$

P.T.O.

- Q.4** a) Draw and explain Chromaticity diagram. (05)
b) Explain Pseudo colour image processing technique with suitable example. (05)
- Q.5** a) Write short note on metric spaces. (05)
b) What is pattern recognition? Explain in brief. (05)
- OR**
- Q.5** a) Explain design cycle of pattern recognition. (05)
b) Differentiate Supervised learning and unsupervised learning. (05)
- Q.6** a) What are the challenges in Bayesian decision theory? (05)
b) Write short notes on linear Discriminates function. (05)
- OR**
- Q.6** a) Discuss the general principal of Maximum likelihood estimation in brief. (10)

* * * *