

**B. Tech. Sem - VIII (Computer Engg.) (2014 COURSE) (CBCS) :
WINTER - 2018**

SUBJECT: IMAGE PROCESSING & PATTERN RECOGNITION

Day: Wednesday
Date: 14/11/2018

W-2018-2621

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) Use of non-programmable calculator is allowed.
- 4) Draw neat and labeled diagrams wherever necessary.

Q.1 a) What are the stages through which an image passes in an Image processing system? Explain. **(05)**

b) Explain about image sampling and Linear and Non-linear quantization process. **(05)**

OR

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

b) What is Connectivity? Explain Connectivity concept for Gray scale image. **(05)**

Q.2 a) What do you mean by ringing effect? How do you avoid ringing effect in High Pass filter? **(05)**

b) Noisy Image corrupted by Salt and Pepper noise, is filtered by: **(05)**
i) Weighted Mean Filter
ii) Weighted Median Filter
Compare the results.

OR

Q.2 a) What are different types of Edges? Explain with suitable example response of second order derivative filter. **(05)**

b) What do you mean by Power law transformation and Gray level slicing operation? **(05)**

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

b) What is image compression? Compare Lossy and Lossless image compression. **(05)**

OR

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

b) Explore Classification of Image segmentation algorithms. **(05)**

Q.4 a) What are the properties of pigment? Which are primary and secondary colors of light and pigment? **(05)**

b) Explain pseudo color image processing technique with suitable example. **(05)**

P.T.O.

OR

Q.4 a) Find our erosion and dilation from the following matrices (05)

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

$$B = \begin{bmatrix} 1 & 1 & 1 \end{bmatrix}$$

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

$$A = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix} \quad B_1 = \begin{bmatrix} \times & \times & 0 \\ 0 & 1 & 1 \\ 0 & \times & \times \end{bmatrix}$$

Q.5 a) Differentiate supervised learning and unsupervised learning. (05)

b) Explain the concept of feature extraction in pattern recognition system with example. (05)

OR

Q.5 a) Explain design cycle of pattern recognition. (05)

b) Differentiate Clustering and Classification. (05)

Q.6 a) What are challenges in Bayesian decision theory? (05)

b) Write algorithm for K-means clustering with the help of diagram. (05)

OR

Q.6 a) Write a short note on General theory of Bayesian Parameter estimation. (05)

b) Discuss the general principal of Maximum likelihood estimation. (05)

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