

**B. TECH. (CBCS - 2014 COURSE) SEM - VIII (COMPUTER
ENGG.) : SUMMER - 2018**
SUBJECT: IMAGE PROCESSING AND PATTERN RECOGNITIONS

Day: **Tuesday**
Date: **05/06/2018**

S-2018-4666

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) With architecture explain relationships between pixels. **(05)**

b) Explain in detail sampling and quantization. **(05)**

OR

Q.1 a) Draw architecture of components in digital image processing. **(05)**

b) What is spatial and intensity resolution? **(05)**

Q.2 a) What is order statistics filter used in Image enhancement? **(05)**

b) Explain in detail noise model. **(05)**

OR

Q.2 a) What do you mean by image negation of gray scale and colour image? Elaborate gray level slicing operation in details. **(10)**

Q.3 a) Explain in detail line and edge detection with examples. **(05)**

b) What is the region splitting and merging in image segmentation. **(05)**

OR

Q.3 a) What is image compression? Explain basic compression methods. **(05)**

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

Q.4 a) Find out Hit or Miss transformation from the following matrices. **(05)**

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

b) How the colour helps in better image analysis? Discuss various colour models to specify a colour in a standard way? **(05)**

OR

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

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

P.T.O.

- b) Find out the dilation and erosion on following matrices (05)

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

- Q.5 a) Differentiate Clustering and Classification. (05)

- b) Explain design cycle of pattern recognition. (05)

OR

- Q.5 a) Explain the concept of feature extraction in pattern recognition system with example. (05)

- b) Explore the various steps used for Object detection. (05)

- Q.6 a) Write short notes on nonlinear decision boundaries. (05)

- b) With an example discuss clustering criteria in detail. (05)

OR

- Q.6 a) Write algorithm for K-means clustering with the help of diagram. (05)

- b) Explore DBSCAN-Density-based spatial clustering of application with noise. (05)

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