

Total No. of Questions : 4]

SEAT No. :

PA-10332

[Total No. of Pages : 2

[6009]-347

T.E. (E & TC Engineering) (Insem.)

DIGITAL IMAGE PROCESSING

(2019 Pattern) (304195) (Semester - II) (Elective - II)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates :

- 1) Answer Q1 or Q2 and Q3 or Q4.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) You answers will be valued as a whole.
- 5) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- 6) Assume suitable data, if necessary.

- Q1)** a) What is histogram of an image? Draw and explain in brief histogram for dark, bright, low contrast and high contrast images. [6]
- b) What is color model? Compare RGB & YIQ color model along with their application. [5]
- c) Consider two pixels 'p' and 'q', whose coordinates are (0, 0) and (6, 3). Calculate the Euclidean distance and chess board distance between them. [4]

OR

- Q2)** a) With reference to relation between pixel explain with example. [6]
- i) 4 Connectivity
 - ii) 8 Connectivity
 - iii) Mixed connectivity
- b) Explain following functional blocks of digital image processing in short. [5]
- i) Image Acquisition
 - ii) Pre-processing
 - iii) Segmentation
 - iv) Representation & description
 - v) Recognition and interpretation

P.T.O.

- c) Write the expression to find the number of bits to store a digital image. Hence find out the number of bits required to store a 256×256 image with 32 gray levels. [4]

Q3) a) Specify the need of image enhancement? Hence explain in short two categories of spatial domain image enhancement. [6]

b) Explain Average filtering of an image with example. [5]

c) Write expression, draw graph & explain in short log transformation and power law transformation. [4]

OR

Q4) a) Obtain Histogram and Histogram equalization for a given image (4×4) - 4 bits per pixel, given by [6]

$$\begin{bmatrix} 10 & 12 & 8 & 9 \\ 10 & 12 & 12 & 14 \\ 12 & 13 & 10 & 9 \\ 14 & 12 & 10 & 12 \end{bmatrix}$$

b) Explain non-linear filtering method of an image v. with example. [5]

c) Explain Bit Plane Slicing technique and its importance. [4]

