CBCS SCHEME

USN | | | | | | | | | | |

15TE655

# Sixth Semester B.E. Degree Examination, Aug./Sept. 2020
## Image Processing

Time: 3 hrs. Max. Marks: 80

**Note:** ***Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

### Module-1

1 a. With the help of neat block diagram explain the fundamental steps of digital image processing. **(10 Marks)**

b. Explain the basic relationships between pixels :
i) 4 – adjacency
ii) 8 – adjacency
iii) m – adjacency. **(06 Marks)**

**OR**

2 a. With the help of neat block diagram explain the components of general purpose image system processing. **(08 Marks)**

b. What is a digital image? Explain about sampling and quantization of an image. **(08 Marks)**

### Module-2

3 a. A histogram has 8 levels of size 64 × 64 as shown in Fig.Q3(a). Draw the histogram of an equalized image.

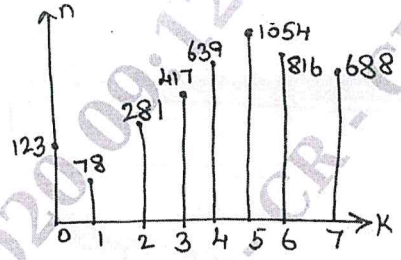


Fig.Q3(a) **(08 Marks)**

b. Explain the following intensity transformation function with necessary graphs.
i) Image negative
ii) Log transformation
iii) Power law transformations (Gamma). **(08 Marks)**

**OR**

4 a. Explain the basic concept of spatial filtering in image enhancement. **(08 Marks)**

b. Explain image sharpening in spatial domain using 2nd order Laplacian mask. **(08 Marks)**

### Module-3

5 a. Explain the following properties of 2DDFT.
i) Translation
ii) Rotation
iii) Periodicity
iv) Separability. **(08 Marks)**

b. Explain homomorphic filtering in image enhancement. **(08 Marks)**

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**OR**

6 a. Explain the following noise probability density function :
i) Gaussian ii) Erlang iii) Rayleigh iv) Exponential. **(08 Marks)**

b. Explain order statistic filters used in image restoration in the presence of noise. **(08 Marks)**

## Module-4

7 a. Explain 3 principal ways to estimate the degradation function for use in image restoration. **(10 Marks)**

b. Explain inverse filtering approach and its limitation in image restoration. **(06 Marks)**

**OR**

8 a. Write the mask for Robert, Sobel and Prewitt operator. **(06 Marks)**

b. Write a note on Hit and Miss transformation Erosion and dilation. **(10 Marks)**

## Module-5

9 a. Explain region based segmentation technique. **(08 Marks)**

b. Explain boundary tracing algorithm. **(08 Marks)**

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**OR**

10 a. Explain how chain codes can be used for boundary representation. **(06 Marks)**

b. Explain minimum perimeter polygon approach for boundary representation. **(06 Marks)**

c. Write a note on signatures. **(04 Marks)**

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