

# MID TERM SEMESTER EXAMINATION, MARCH-2017

COURSE: M.Tech (2<sup>nd</sup> Semester)  
Course No: PGMTH2E004T  
Course Title: Digital Image Processing

Time Allowed: Two Hours

Max Marks: 50

## Instructions:

### SECTION-A

Section A contains Ten Multiple choice Questions and all are compulsory carrying one Mark each.

1. Choose the right options for each of the following multiple choice questions

**I. The transition between continuous values of the image function and its digital equivalent is called \_\_\_\_\_**

- (A) Quantisation (B) Sampling  
(C) Rasterisation (D) None of the Mentioned

**II. Simplest image processing technique is**

- (A) spatial transformation (B) intensity transformation  
(C) coordinates transformation (D) domain transformation

**III. Image enhancement traditionally included**

- (A) smoothing (B) sharpening  
(C) degradation (D) Both A and B

**IV. Pixels are digital numbers that are composed of**

- (A) color (B) intensity levels (C) dots (D) bits

**V. Log transformation is given by the formula**

- (A)  $s = \text{clog}(r)$  (B)  $s = \text{clog}(1+r)$   
(C)  $s = \text{clog}(2+r)$  (D)  $s = \log(1+r)$

**VII. An image is a two dimensional function where x and y are**

- (A) spatial coordinates (B) frequency coordinates  
(C) time coordinates (D) real coordinates

**VIII. Digitizing coordinate values is called**

- (A) Radiance (B) Illuminance  
(C) Sampling (D) Quantization

**IX. Digital image with intensity levels in range [0, L-1] is called**

- (A). k-map (B). histogram  
(C). truth table (D). graph

**X. Negative of image is**

- (A). enhancing intensity levels (B). reducing intensity levels  
(C). adding intensity levels (D). reversing intensity levels

## SECTION- B

*Section B contains five short answer questions of 6 Marks each. Any three need to be attempted.*

2. Discuss various types of images used for digital image processing.
3. What do you mean by quality of an image? How the quality of an image is measured?
4. What is the storage requirement for a  $1024 \times 1024$  24 bit colour image?
5. Differentiate between image quality enhancement and image restoration.
6. How image sampling is different from image quantization?

## SECTION -C

*Section C contains two long answer questions with internal choice. Each question carries eleven Marks*

### UNIT-I

7. What is digital image processing? Discuss various levels of digital image processing and its applications.

**OR**

What are various types of arithmetical operations possible on images? Implement using MATLAB code.

### UNIT-II

8. What do you mean by contrast stretching and thresholding? Perform the image enhancement for the  $8 \times 8$  image using image histogram stretching.

$r_k$	0	1	2	3	4	5	6	7
$p_k$	8	10	10	2	12	16	4	2

**OR**

How image Histogram is useful to check the quality of an image? Write a procedure for histogram equalisation. Perform the histogram equalisation for the following  $3 \times 3$  image.

1	3	5
4	4	3
5	2	2