Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(EIE) (2011 Onwards E-IV) (Sem.–7,8)

# MACHINE VISION

Subject Code : DE-4.1

Paper ID : [A0380]

Time : 3 Hrs. Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

## SECTION-A

**1. Answer briefly :**

i What is meant by visual perception ?

ii What is sampling theorem ?

iii Define a graphic object.

iv Calculate the size of the image if each color component of RGB image of size 256 × 256 is represented by 8-bits.

v What is image thresholding?

vi How do you detect a straight line in a digital image using a machine vision algorithm?

vii List any three components of real time machine vision system.

viii List any two model based machine vision systems.

ix What is role of mensuration used in machine vision for industrial inspection ?

x What would be the output image after convolving an image with an identity matrix?

## SECTION-B

2. Explain modulation transfer function and visibility function for human vision.

3. List few graphic objects commonly used in computer graphics. Discuss their usefulness in computer vision systems.

4. Discuss the application of machine vision in vehicle license plate number sensing.

5. Discuss different types of feature points and feature descriptors used in recognition of objects in digital images.

6. What are some of the commonly used tracking methods in image sequences? List their advantages and disadvantages.

## SECTION-C

7. What are different steps involved in design of a real time machine vision system? Discuss various issues in such a design.

8. Explain knowledge based vision system. How such systems are used for visual inspection in industrial applications? Discuss it.

9. How discontinuities are detected in digital images and how edges are linked? Discuss image segmentation using thresholding technique.