

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA - SEMESTER-V • EXAMINATION – SUMMER • 2015**

**Subject Code: 650011****Date: 11-05-2015****Subject Name: Image Processing****Time: 02:30 pm to 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** (i) Define Digital image Processing **03**  
(ii) Describe the Histogram Equalization process. **04**
- (b)** (i) Give the application of discrete Fourier transform. **02**  
(ii) Write short notes on mathematical tools used in digital image processing. **03**  
(iii) List any 2 principles of compression algorithms. **02**
- Q.2 (a)** (i) List the fundamental steps in Image processing. Describe any 3 **04**  
briefly.  
(ii) Define Quantization. **03**
- (b)** Describe the components of an image processing system with a suitable block diagram. **07**
- OR**
- (b)** Describe the various elements involved in visual perception. **07**
- Q.3 (a)** Give the different ways of Histogram processing and describe effects **07**  
on digital images.
- (b)** Define High-pass frequency domain filters and describe how they are **07**  
used for image sharpening.
- OR**
- Q.3 (a)** Describe any 4 color models with their corresponding matrix forms. **07**  
**(b)** Give the fundamentals of Full color image processing. **07**
- Q.4 (a)** Write notes on Huffman codes and explain the encoding and decoding **07**  
mechanisms.
- (b)** (i) What is Image segmentation? Give its fundamentals. **04**  
(ii) Write short notes on Thresholding. **03**
- OR**
- Q.4 (a)** Explain how point detection is made? **07**  
**(b)** Explain how line detection is made? **07**
- Q.5 (a)** What are the different edge detection methods available? Explain any **07**  
4 of them.
- (b)** Give the fundamentals of Spatial filtering. Outline the smoothing and **07**  
sharpening procedures.
- OR**
- Q.5 (a)** List and explain the properties of the 2D discrete Fourier transform. **07**

- (b) Write notes on
- a) LZW coding **02**
  - b) Run-length coding **02**
  - c) Block transform coding **03**

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