

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA - SEMESTER - V EXAMINATION - WINTER 2015

Subject Code: 650011**Date: 10/12/2015****Subject Name: Image Processing (IP)****Time: 10.30 am to 01.00 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) What is Digital Image Processing? Discuss any four applications of Digital Image Processing. **07**
- (b) 1. Explain components of an Image Processing System. **05**
 2. Discuss following terminologies: **02**
 A. Monochromatic Light
 B. Chromatic Light
- Q.2** (a) Discuss simple Image Formation Model in detail. **07**
 (b) Explain following: **07**
 1. Image Sampling
 2. Image Quantization
- OR**
- (b) 1. List any three mathematical tools used in Digital Image Processing. **01**
 2. Explain following basic Intensity Transformation Functions: **06**
 A. Log Transformations
 B. Gamma Transformations
- Q.3** (a) Write a short note on Histogram Matching. **07**
 (b) Discuss Sampling Theorem in brief. **07**
- OR**
- Q.3** (a) 1. Explain Unsharp Masking and Highboost Filtering in brief. **05**
 2. List any two properties of the 2-D Discrete Fourier Transform. **02**
 (b) What is Aliasing? Explain it in detail. **07**
- Q.4** (a) Explain Correspondence between Filtering in the Spatial and Frequency Domains. **07**
 (b) 1. Which characteristics are generally used to distinguish one color from another? **02**
 2. Explain RGB Model in detail. **05**
- OR**
- Q.4** (a) Discuss following Frequency Domain Filters used in Image Smoothing: **07**
 1. Ideal Lowpass Filters
 2. Butterworth Lowpass Filters
 3. Gaussian Lowpass Filters
 (b) 1. Write the formula for following: **06**
 a. Converting colors from HSI to RGB
 b. Converting colors from RGB to CMY
 c. Converting colors from RGB to HSI
 2. What is Coding Redundancy? **01**
- Q.5** (a) Write down rating scale of the Television Allocations System Organization. **07**

- (b) 1. Explain Block Transform Coding. **03**
2. What are the three fundamental steps required for edge detection? **04**

OR

- Q.5** (a) Write any seven Internationally sanctioned image compression standards with organization name and descriptions. **07**
(b) Write a short note on Optimum Global Thresholding Using Otsu's Method. **07**
