Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

SEVENTH SEMESTER B.TECH (INSTRUMENTATION & CONTROL ENGG.)

END SEMESTER EXAMINATIONS, DEC 2016/JAN 2017

SUBJECT: IMAGE PROCESSING [ICE 449]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** questions.
- Missing data may be suitably assumed.

1A.	What are the fundamental steps in image processing?	4
1B.	With neat sketch, explain any two basic sensors used in image acquisition device.	4
1C.	Define following terms: 1. Image negative 2 Gamma transformation	2
2A.	What are the different levels in image processing?	3
2B.	Draw the structure of image formation model. Explain the importance of brightness adaptation in image processing.	4
2C.	Compare Spatial and Gray Level Resolutions. Give an example for each.	3
3A.	Explain the application of two dimensional sampling and quantization in image processing.	4
3B.	What is histogram matching? Compute the histogram equalization for the following probabilities having eight gray levels. B = {0.19, 0.25, 0.21, 0.16, 0.08, 0.06, 0.03, 0.02}.	4
3C.	Define contrast stretching with an example.	2
4A.	What is image sharpening spatial filter? Explain different types with an example.	4
4B.	What are order statistics filters? Explain median filter with an example.	3
4C.	Give the model of image restoration when an additive noise term is operated on the input image in spatial domain.	3
5A.	Discuss spatial and frequency properties of noise.	3
5B.	Explain the active processing stages of Lossless predictive encoding.	3
5C.	What are lossless compression techniques? Compute the Huffman coding for the following probability distribution. A = {0.4, 0.3, 0.1, 0.1, 0.06, 0.04}	4
6A.	Discuss the active feature processing stages of an object detection system.	3
6B.	Design a multi-dimensional data processing pipeline for object recognition system in spatial domain.	3
6C.	Write a short note on the following with its probability density function: 1. Gaussian Noise 2. Rayleigh Noise	4