Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

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

END SEMESTER EXAMINATIONS, NOV/DEC 2016

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 components of digital image processing? Explain each with an example.	**5**
1B.	Explain the importance of sensor strip and sensor array in image acquisition.	**3**
1C.	List any four basic relationships between pixels.	**2**
2A.	Draw the structure of image formation model. Give the importance of different levels in image processing.	**3**
2B.	Discuss the sampling and quantization in image processing.	**4**
2C.	Give the difference between spatial and gray level resolution with example.	**3**
3A.	Define histogram processing. Compute the histogram equalization for the following probabilities having eight gray levels. B = {0.18, 0.28, 0.19, 0.14, 0.10, 0.06, 0.03, 0.02}.	**5**
3B.	With the mathematical formulation, explain first and second order derivative filters used in image processing.	**3**
3C.	Describe the importance of sobel filter in edge detection	**2**
4A.	With neat sketch, explain the model of image degradation/restoration.	**4**
4B.	Explain any three noise models with their probability density function.	**3**
4C.	Describe the fundamental steps in Huffman coding with example.	**3**
5A.	What you mean by LZW coding technique? Compute the LZW coding for the following sequence. A = [89 89 89; 26 26 89; 89 26 26; 65 65 28]	**4**
5B.	What is the different between objective and subjective fidelity criteria? Explain with their formulation and examples.	**3**
5C.	Explain the active processing stages of Lossless predictive encoding.	**3**
6A.	Design a multi-dimensional data processing pipeline for object recognition system in frequency domain.	**4**
6B.	Write a short note on: 1) Nearest neighbor interpolation 2) Bilinear Interpolation 3) Discrete wavelet transform	**6**