GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER – VIII.EXAMINATION – WINTER 2016

Subject Code: 181102   **Date: 22/10/2016**
Subject Name: Fundamentals of Image Processing (Department Elective - II)
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) Explain different types of image file formats.   07

(b) Derive Huffman code for encoding gray levels in image and find compression   07
ratio.

3	3	3	2
2	3	3	3
3	2	2	2
2	1	1	0

Q.2 (a) What is histogram? Explain histogram equalization algorithm. Write pseudo   07
code or Matlab code for calculation of histogram and histogram equalization

(b) What is contrast stretching? Explain any one contrast stretching function with   07
help of graph and its pseudo code for implementation.
OR
(b) What is redundancy in an image? Explain different types of redundancy in an   07
image.

Q.3 (a) Explain edge detection using first –order derivatives.   07

(b) What is wavelet? Explain how wavelet transform is used to decompose image   07
with help of block diagram?
OR
Q.3 (a) Explain region splitting and merging.   07
(b) List out various basic morphological algorithms and explain any one in detail.   07

Q.4 (a) Explain spatial filtering process. Write MATLAB code for convolution of   07
3x3 filter mask with image of size MxN. Write 3x3 mask for low pass
filtering and high pass filtering.

(b) Write short note on gray level slicing.   07
OR

Q.4 (a) Explain two dimensional DFT and state any three properties of 2-D DFT.   07

(b) Explain a linear image degradation model in detail.   07

Q.5 (a) Explain RGB color model and its application. 07

(b) Explain different noise probability density functions using mathematical expressions and graphs. 07

OR

Q.5 (a) Which are the different types of colour image processing? Explain them. 07

(b) Discuss steps of image filtering in frequency domain. 07

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