

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VIII (OLD) EXAMINATION – WINTER 2020****Subject Code:181102****Date:25/01/2021****Subject Name:Fundamentals Of Image Processing****Time:02:00 PM TO 04:00 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Draw and explain structure of human eye and discuss human vision system. **07**  
(b) Explain basic difference between point processing and mask processing. **07**  
Generating negative image is point process or mask process? Explain Pseudo code for the generation of negative image for 256 gray level digital image.
- Q.2** (a) Consider that image is corrupted by Gaussian noise. Suggest suitable method to minimize Gaussian noise from the image **07**  
(b) What is first order and second order derivatives of an image? Why second order derivative is not much preferred for edge detection? How Laplacian of Gaussian (LoG) solves problem of second order derivative for edge detection? **07**
- Q.3** (a) Explain basic steps for filtering of image in frequency domain. What are the filter mask used for low pass filtering and high pass filtering? **07**  
(b) Explain 2D wavelet transform for digital image processing with help of block diagram **07**
- Q.4** (a) Explain different order statistic filter used for noise reduction. **07**  
(b) Write a detailed note on image pyramids and sub-band coding. **07**
- Q.5** (a) Explain different noise model in image. **07**  
(b) How HSI Color model is well suited for human interpretation? Write expressions for conversion of HSI to RGB **07**
- Q.6** (a) Explain a linear image-degradation model, an inverse restoration filter and its limitations. **07**  
(b) Which are the different types of colour image processing? Explain them. **07**
- Q.7** (a) What is segmentation? List segmentation approaches. Explain use of gradient operators to find out discontinuities **07**  
(b) Explain various methods for detecting edge in an image. **07**
- Q.8** (a) Explain dilation and erosion morphological operations **07**  
(b) Explain Lossy compression and compare Lossless and Lossy compression. **07**

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