Roll No .....

IT - 832

B.E. VIII Semester

Examination, June 2015

Image Processing

(Elective - III)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt all questions.
ii) All questions carry equal marks.

1. a) What are the fundamental steps involved in digital image processing? How an image is acquired? 7

   b) How are Fourier transform useful in image processing? Work out the Fourier transform of the following function $f(t) = 0$ for $t < -5$ and $t > 5$

   $= 8$ otherwise. 7

OR

2. a) Derive a Two-Dimensional discrete Fourier transform and its inverse. 7

   b) A colored image has 320 rows and 600 columns. Work out the number of bits needed to store the image using 256 colors (8 bit). 7

3. a) Write the formula for convolution of two functions and how this concept is used for filtering in frequency domain. 7

b) What do you understand by a sharpening filter? Indicate any one of the sharpening filter that could be used on a gray level image. 7

OR

4. a) Describe an ideal smoothing frequency domain filter H(u,v). If F(u,v) is the Fourier transform of an image. Which is subjected to a smoothing filter, work out the Fourier transform of the smoothed image. 7

b) Describe a frequency domain ideal low pass filter. If the image is of size P×Q, what would be the size of the corresponding frequency domain transformed image? 7

5. a) What are the steps involved in carrying out lossy compression using DCT? Indicate the process of bit allocation using either zonal coding or threshold coding. 7

b) Define block transform coding and then explain zonal coding algorithm used for image compression. 7

OR

6. a) Explain the LZW coding scheme by using the following image segment. 7

123	123	82	82
123	123	82	82
123	123	82	82
123	123	82	82

b) Explain briefly: 7

i) Run length coding

ii) Bit plane coding

7. a) Why the laplacian is not used in original form for edge detection? Explain the way it is used for edge detection in an image. 7

b) Indicate how an image is segmented using region based segmentation. 7

OR

8. a) Explain the thresholding? Write algorithm to compute basic global threshold value. 7

b) What do you understand by gray level co - occurrence matrix of an image? Indicate any three descriptors which operate on this matrix to quantify the texture of an image? 7

9. a) Show how the "hit or miss transformation" operation is carried out by taking an example. What is the use of this morphological operation? 7

b) What is chain code? How this code is used to represent in image? 7

OR

10. a) What are the structuring elements used in morphological processing. Give three structuring elements that are symmetric. 7

b) Write short notes: 7

i) Polygonal Approximations.

ii) Boundary Description.

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