

BE8-R3: DIGITAL IMAGE PROCESSING

NOTE:

1. Answer question 1 and any FOUR questions from 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours

Total Marks: 100

1.
 - a) Explain the concept of blending.
 - b) Explain the bitmap representation of a color image.
 - c) Give reasons for storing gray scale images using 256 levels.
 - d) What is the basic difference between image processing and audio signal processing?
 - e) What do you mean by resolution of an image? Relate resolution with processing time and communication cost.
 - f) What is Line Profile? Give its applications.
 - g) Differentiate between lossless and lossy compression. Illustrate with examples.

(7x4)

2.
 - a) What do you mean by Grayscale transform of an image? How can you implement look-up table for light and contrast modification?
 - b) Give one procedure to convert a Color image in RGB into grayscale.
 - c) What do you mean by motion detection? Discuss static background motion detection.

(5+5+8)

3.
 - a) Why do we perform image processing in frequency domain although images are generally represented in spatial domain?
 - b) Give a general procedure to implement filtering in frequency domain.
 - c) Discuss the usefulness of FFT in digital image processing.

(6+6+6)

4.
 - a) What do you mean by an image histogram? What could be the possible comment that can be made about the quality of an image by looking at the histogram of that image?
 - b) Discuss preprocessing and post processing as image enhancement techniques.
 - c) What do you mean by affine, projective and box transformations? Give examples for each of these.

(6+6+6)

5.
 - a) Discuss one compression technique which would be efficient to compress data with long sequence of repeated characters.
 - b) Explain all the steps in JPEG compression standard.

(8+10)

6.

- a) What is the result of applying thresholding to an image? How do we choose thresholding level(s)? Give a specific application of thresholding.
- b) What do you mean by registration of an image? Give its applications.
- c) Discuss Quadtree Decomposition of an image. What are its applications?

(6+6+6)

7.

- a) What is binary morphology?
- b) Discuss dilation, erosion, opening and closing operations.
- c) How are morphological operations used to extract skeleton of a binary image.

(3+6+9)