Code: EC7T2

IV B.Tech - I Semester – Regular/Supplementary Examinations
October - 2018

DIGITAL IMAGE PROCESSING
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours   Max. Marks: 70

PART – A

Answer **all** the questions.   All questions carry equal marks

11 x 2 = 22 M

1.
   a) What is the need for image compression?
   b) Define the 2-D discrete Fourier transform of an image.
   c) Define the image negative transformation and mention its application.
   d) What is an image histogram? Plot the histogram of a dark image.
   e) What is the effect of low pass and high pass filtering on an image?
   f) Explain the principle of predictive coding.
   g) Mention the masks used for point and line detection.
   h) What is the advantage of image averaging?
   i) Define the erosion and dilation operations on an image.
   j) What is the relationship between RGB and CMYK Color models?
   k) What is the compression method used in JPEG image compression?

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

$$3 \text{ x } 16 = 48 \text{ M}$$

2. a) Define and describe the following fundamental steps in digital image processing.
   i) Image enhancement and   ii) Image compression.   8 M

   b) Explain the need for and process of sampling and quantization of image data. Mention the typical values used for spatial and intensity resolution.   8 M

3. a) Distinguish between spatial filtering and frequency domain filtering. Describe the smoothing and sharpening filter masks of size 3 X 3.   8 M

   b) Explain the concept of histogram equalization and mention its applications.   8 M

4. a) Discuss the lossy and lossless compression techniques with neat block diagrams.   8 M

   b) Describe the block transform coding (with a neat block diagram) and mention the image compression standards using this approach.   8 M

5. a) Discuss about point detection, line detection and edge
      Detection.   8 M

   b) Describe different thresholding techniques used in image
      segmentation.   8 M

6. a) Describe the different models for representation of colour
      Information in images.   8 M

   b) Write short notes on pseudo colour image processing.   8 M