

GANPAT UNIVERSITY
B. Tech. Sem. VII (CE/IT) CBCS
Regular Examination Nov/Dec 2014
2CE704/2IT704: Fundamentals of Image Processing

Max. Time: 3 Hrs.]

[Max. Marks: 70

Instructions:

1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

SECTION-I

- Q-1**
- (A) Discuss unsharp masking and highboost filtering. (4)
 - (B) Why piecewise linear transformation is used? Explain any two techniques of it. (4)
 - (C) Explain procedure involve in histogram equalization. (4)

OR

- Q-1**
- (A) Discuss different order – statistic filters. (4)
 - (B) Explain log transformation and power law transformation. (4)
 - (C) Explain histogram matching in detail. (4)

- Q-2**
- (A) Define image. Explain various components of an image processing system. (6)
 - (B) Explain the concept of image sampling and quantization. (5)

OR

- (A) Describe the fundamental steps in digital image processing. (6)
- (B) Write a short note on light and electromagnetic spectrum. (5)

- Q-3** Answer the following. (Each of 1 mark) (12)

- (1) Find the number of bits required to store a 256 X 256 image with 32 gray levels.
- (2) What is meant by path?
- (3) What is the effect of dynamic range on an image?
- (4) Give the formulas for calculating D_4 and D_8 .
- (5) Define spatial resolution.
- (6) How to obtain complement of an image?
- (7) When pixel replication technique is used?
- (8) What would be the effect on the histogram if we set to zero the higher order bit planes of an image.
- (9) What is the idea behind weight value of 2 in sobel mask?

- (10) Why coefficients of mask used to compute gradient sum to zero?
- (11) Differentiate boundary and edge.
- (12) Define resolution.

SECTION-II

- Q-4 (A) Explain erosion and dilation in detail. What is the limiting effect of repeatedly dilating and eroding an image, when non trivial structuring element is used. (6)
- (B) Explain thinning and thickening operations. (6)

OR

- Q-4 (A) Discuss opening and closing in detail. Also discuss the properties of these operations. (6)
- (B) Explain the morphological operation for extraction of connected components. (6)
- Q-5 (A) Explain the concept of edge linking by using global processing? (6)
- (B) Write a short note on LOG. (5)

OR

- Q-5 (A) Explain how image segmentation algorithms are categorized? Discuss how point and line detection algorithms works? (6)
- (B) Briefly explain the different phases of canny edge detector. (5)
- Q-6 (A) Define chain code. Explain three different techniques of polygonal approximation. (6)
- (B) Write a short note on basic global and adaptive thresholding techniques. (6)

END OF PAPER