Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 13262

M.E. DEGREE EXAMINATION, JANUARY 2015.

Elective

Computer Science and Engineering

CP 7004 — IMAGE PROCESSING AND ANALYSIS

(Common to M.E. Computer Science and Engineering
(With Specialization in Networks)

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. List different image file formats.

2. Compare image enhancement and restoration. Give and sketch the PDF of Erlang noise.

3. What are the different approaches that can be used to segment the image?

4. If all pixels in the images are shuffled, will there be any change in the histogram of the image? Justify your answer.

5. How a sensed data is converted into a digital format?

6. Why nearest neighbor interpolation approach is not used often?

7. Give the Robert mask to detect the horizontal and vertical edge in an image.

8. Why median filter is considered as non-linear filter?

9. Why we need pseudo color image processing? What are the techniques adopted?

10. What is need for tonal transformation?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the different elements of image processing system using suitable diagrams.

Or

(b) Discuss in detail Haar transform.

12. (a) Explain in detail periodic noise reduction using frequency domain filtering.

Or

(b) For a 5 bit input image given below, perform equalization $\begin{pmatrix} 8 & 8 & 8 & 1 & 1 \\ 5 & 1 & 10 & 10 & 30 \\ 15 & 15 & 30 & 30 & 10 \\ 5 & 5 & 1 & 10 & 30 \\ 8 & 10 & 15 & 8 & 30 \end{pmatrix}$. Explain Gaussian high pass filtering operation for image sharpening.

13. (a) Prove the following properties of 2D-DFT.

(i) Periodic property

(ii) Convolution property

(iii) Conjugate Symmetry property

(iv) Spatial shift property.

Or

(b) Under what conditions lossless compression is preferred? With a block diagram explain transform based image compression scheme.

14. (a) Discuss in detail various morphological algorithms.

Or

(b) Explain the following gray-level transformation techniques in detail.

(i) Image negative

(ii) Contrast stretching

(iii) Gray level slicing

(iv) Thresholding

15. (a) Explain the various techniques adopted in color transformation.

Or

(b) Explain digital image water marking in detail.

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