Code: 15A10801

R15

B.Tech IV Year II Semester (R15) Advanced Supplementary Examinations July 2019

DIGITAL IMAGE PROCESSING

(Electronics & Instrumentation Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) List out the practical limitations in sampling and quantization.
(b) Mention any four mathematical operations that can be performed on an image.
(c) Compare Discrete Fourier transform and Discrete Cosine transform.
(d) Why Hadamard transform is suitable for signal and image transforms?
(e) What is meant by thresholding operation in image enhancement?
(f) How does the color image are enhanced?
(g) Mention the difference between inverse and pseudo inverse filtering.
(h) What is template matching?
(i) State the need for compression of image data.
(j) Perform the run length encoding of the 1-D sequence:
6, 6, 6, 6, 6, 6, 3, 3, 3, 3, 2, 2, 7, 7, 7, 6.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 With suitable example, explain 2D sampling theory.

OR

3 List out the various mathematical tools used in image processing and explain how these tools can be applied to perform certain image processing task.

UNIT – II

4 Derive any four properties of 2-D orthogonal and unitary transform.

OR

5 Obtain the Walsh transform matrix of order N = 4.

UNIT – III

6 Discuss briefly about histogram equalization technique and its specification.

OR

7 Elaborate on the various image sharpening methods in detail.

UNIT – IV

8 Explain how the Wiener filter is used in image restoration. Also mention the advantages of Wiener filter over other filters.

OR

9 With suitable illustrations, explain any two image segmentation methods in brief.

UNIT – V

10 A message with symbols with their probability is given as $\{a_1, a_2, a_3, a_4,\}$ as $\{0.2, 0.2, 0.4, 0.2\}$ apply arithmetic coding. Compute average number of bits per symbol.

OR

11 State the differences between lossy and lossless codings and explain the various formats and standards of image compression.

*****