

Code: 13A04704

B.Tech IV Year II Semester (R13) Advanced Supplementary Examinations July 2018

DIGITAL IMAGE PROCESSING

(Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- What are the steps involved in digital image processing?
 - Define pixel.
 - What are the properties of unitary transform?
 - Give any two properties of DFT.
 - What do you mean by color image enhancement?
 - Memorize the various steps in frequency domain enhancement.
 - What is inverse filtering?
 - List the various types of discontinuities in image.
 - What is Runlength coding?
 - What is the need for compression?

PART – B

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

UNIT – I

- 2 Elaborate any three basic relationships between pixels with an example.

OR

- 3 Explain the basic concept in image sampling and quantization.

UNIT – II

- 4 Discuss the implementation Walsh transforms and find basis matrix for $N = 4$.

OR

- 5 Prove that discrete cosine transform is orthogonal for $N = 4$.

UNIT – III

- 6 Explain the basic concept of Histogram equalization technique for image enhancement.

OR

- 7 Differentiate between spatial domain techniques and frequency domain techniques of image enhancement.

UNIT – IV

- 8 With necessary expressions, explain the Wiener filtering approach for image restoration.

OR

- 9 Discuss in detail about region based approaches in image segmentation.

UNIT – V

- 10 Discuss about transform coding with neat sketch.

OR

- 11 Calculate the compression ratio achieved through the use of Huffman coding for the given 3-bit image

$$f(x, y) = \begin{bmatrix} 6 & 6 & 6 & 2 \\ 2 & 2 & 3 & 4 \\ 3 & 6 & 1 & 6 \\ 5 & 1 & 5 & 1 \end{bmatrix}$$
