Code: 13A04704 **R13**

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)

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

(a) What are the steps involved in digital image processing?
(b) Define pixel.
(c) What are the properties of unitary transform?
(d) Give any two properties of DFT.
(e) What do you mean by color image enhancement?
(f) Memorize the various steps in frequency domain enhancement.
(g) What is inverse filtering?
(h) List the various types of discontinuities in image.
(i) What is Runlength coding?
(j) 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 $f(x,y) = \begin{bmatrix} 6 & 6 & 6 & 2 \\ 2 & 2 & 3 & 4 \\ 3 & 6 & 1 & 6 \\ 5 & 1 & 5 & 1 \end{bmatrix}$.

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