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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations Feb-2021

DIGITAL IMAGE PROCESSING

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Explain the components of digital image processing along with the suitable block diagram. **6M**
b Define distance measures in digital image processing? Explain different types of distance measures. **6M**

OR

- 2 a Explain the following mathematical operations on digital images. **6M**
i) Array versus Matrix operations ii) Linear versus Nonlinear Operations.
b Explain the important terms related to Imaging Geometry with suitable applications. **6M**

UNIT-II

- 3 a Define Image Transform and Summarize its importance. **3M**
b List out the properties of 2D –Orthogonal Transform and 2D –Unitary transform. **9M**

OR

- 4 a Prove the Separable property of 2D –Discrete Fourier Transform with relevant expression. **6M**
b Determine the image basis function of 2D –Discrete Fourier Transform when $N = 4$. **6M**

UNIT-III

- 5 a Illustrate the contrast stretching in image enhancement with suitable example. **6M**
b Illustrate the sharpening spatial filters along with the required expressions. **6M**

OR

- 6 a Explain about Homomorphic filtering with necessary equations. **6M**
b Outline the importance of the Color Models and explain the RGB models. **6M**

UNIT-IV

- 7 a Identify parts of the degradation/restoration model in image processing and explain the function the each parts. **7M**
b List out the source of the noise in image processing and outline the spectrum of white noise. **5M**

OR

- 8 a Distinguish the Image Enhancement and Image Restoration. **4M**
b Explain the threshold based segmentation methods with suitable examples. **8M**

UNIT-V

- 9 a Evaluate the coding efficiency for the following probabilities based on Huffman coding. **8M**

Symbol	a1	a2	a3	a4	a5	a6
Probability	0.4	0.3	0.1	0.1	0.06	0.04

- b Compare the variable length coding and arithmetic coding. **4M**

OR

- 10 a Summarize the role of MPEG and SVG for image compression. **7M**
b Compare the lossless compression and lossy compression. **5M**

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