December 2023

B.Tech (CE/IT) 5th Sem.

Image Processing (MD-CV-501)

Time: 3 Hours   Max. Marks:75

Instructions: 1.   *It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.*

2.   *Answer any four questions from Part -B in detail.*

3.   *Different sub-parts of a question are to be attempted adjacent to each other.*

PART -A

Q1   (a)   How Digital Images can be represented?   (1.5)

(b)   Define briefly the following terms: i) image restoration, ii) Compression, iii)   (1.5)
Segmentation

(c)   What is meant by histogram equalization?   (1.5)

(d)   Define coding redundancy?   (1.5)

(e)   What is global, Local and dynamic or adaptive threshold?   (1.5)

(f)   What is the objective of Image enhancement? Define Spatial domain.   (1.5)

(g)   List the shortcomings of Huffman coding.   (1.5)

(h)   What are the three types of discontinuity in digital image?   (1.5)

(i)   Distinguish spatial correlation and convolution.   (1.5)

(j)   Differentiate between lossless and lossy compression   (1.5)

PART -B

Q2   (a)   What are the components of an Image Processing System? Explain with a diagram.   (10)

(b)   Explain Image Smoothing and Image Sharpening Using Frequency Domain Filters.   (10)

Q4   What is image compression? Explain any four variable length coding compression   (15)
schemes.

Q5   (a)   Describe Hough Transforms and Shape Detection. Modify Hough transform to detect   (5)
ellipses.

(b)   Explain the following Color Models i) The RGB Color Model ii) The CMY and CMYK   (10)
Color Models

Q6   (a)   Explain about segmentation based on discontinuities and segmentation based on   (10)
Similarities.

(b)   Describe Edge Detection and Edge Linking.   (5)

Q7   Write a note on the following   (15)
a)   region based image segmentation techniques
b)   Gaussian High Pass and Gaussian Low Pass Filter
c)   split and merge procedure in image segmentation.

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