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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E.

Branch: Electronics and Communication Engineering

Course Code: 19EC5PE2IP

Course: Image Processing

Semester: V

Duration: 3 hrs.

Max Marks: 100

Date: 07.03.2023

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1	a) With a neat diagram explain the fundamental knowledge blocks for Digital Image Processing.	10
	b) Calculate the memory space required to store 1024 X 1024 matrix using 118 as maximum pixel value.	04
	c) Consider (RGB) = (0.683, 0.1608, 0.1922) Convert this to HSI model	06

UNIT - II

2	a) Explain the following : (i) Bit level slicing (ii) Gray level slicing	06
	b) Frequency domain filtering techniques give better results than spatial domain techniques. Justify.	06
	c) Why Gaussian filters in Frequency domain give better results for image enhancements.	08

OR

3	a) What is Image Resolution? Discuss various resolutions used in image enhancement.	10
	b) What is Histogram equalization? Perform histogram equalization for the following matrix	10

$$\begin{bmatrix} 2 & 3 & 3 & 2 \\ 4 & 2 & 2 & 3 \\ 3 & 2 & 3 & 5 \\ 2 & 4 & 2 & 4 \end{bmatrix}$$

UNIT - III

4	a) Define the process of Image restoration with suitable diagram.	06
	b) Discuss any four important noise probability density function.	08
	c) Illustrate inverse filter along with its Limitations.	06

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - IV

5 a) Interpret how Fig (a) can be represented as Fig(b) and Fig(c) using morphological analysis techniques. **10**



Fig 5 (a)

5 (b)

5(C)

b) Describe a morphological algorithm to count the number of objects with horizontal and vertical Lines in Fig (b) and Fig(c). **10**

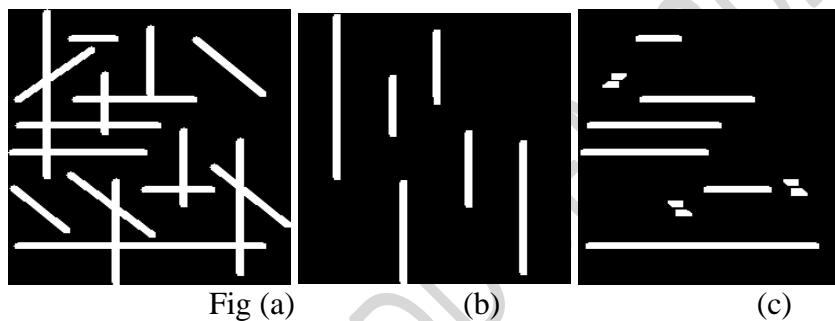


Fig (a)

(b)

(c)

UNIT - V

6 a) Discuss various discontinuities related to segmentation. **10**

b) Illustrate how thresholding plays a major role in segmentation **10**

OR

7 a) Write short notes on **10**

- (i) Edge detection
- (ii) Edge Linking

b) “Segmentation can be based on region”. Justify the statement. **10**
