U.S.N.										

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

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Electronics and Communication Engineering **Duration: 3 hrs.**
Course Code: 19EC5PE2IP **Max Marks: 100**
Course: Image Processing **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.

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 - 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**

UNIT - IV

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

Fig5 (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**

******