

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024****Subject Code:3164201****Date:20-11-2024****Subject Name: Image Processing****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1** (a) What are the advantages of digital processing compared to analog processing? **03**
- (b) Explain binary, gray scale, color and indexed image **04**
- (c) Discuss fundamental steps in digital image processing. **07**

- Q.2** (a) Explain: Sampling and quantization **03**
- (b) Write a short note on image formation **04**
- (c) State applications of different parts of EM spectrum **07**

OR

- (c) Find mean and variance for following image. Also draw its histogram and bit planes. **07**

1	2	0	2
2	1	1	1
2	3	2	1
0	1	1	1

- Q.3** (a) Discuss power law transformation with its application **03**
- (b) Explain Image restoration Model **04**
- (c) Explain the Discrete Cosine Transform **07**

OR

- Q.3** (a) Explain various types of pixel neighboring **03**
- (b) Summarize properties of Fourier Transformation **04**
- (c) Explain Harmonic and Contra harmonic filters. **07**

- Q.4** (a) Compare and contrast: Low pass vs High pass filters **03**
- (b) Describe Butterworth Filter in frequency domain **04**
- (c) Articulate the benefits of adaptive median filter with the proper discussion. **07**

OR

- Q.4** (a) State applications of wavelet transform **03**
- (b) Compare arithmetic mean filter with geometric mean filter. Discuss both with suitable formula **04**
- (c) Write short note on error free compression **07**

- Q.5** (a) Differentiate: Lossless vs lossy compression **03**
- (b) Describe Huffman coding **04**
- (c) Explain the application of hit or miss transformation with its complete explanation **07**

OR

- Q.5** (a) Define: Edge, Boundary, Noise **03**
- (b) Write a short note on LoG **04**
- (c) Explain RGB and CMY color model **07**
