

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V EXAMINATION – SUMMER 2025****Subject Code:3155204****Date:15-05-2025****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) Describe 4 and 8 connectivity with suitable diagram.	03																
	(b) Summarize: Sampling and Quantization	04																
	(c) Illustrate the applications of various components of EM spectrum.	07																
Q.2	(a) Alpha trimmed mean filter with example.	03																
	(b) How histogram help us to understand characteristics of image? Explain with suitable diagrams.	04																
	(c) Perform histogram equalization on following 3-bit image data:	07																
	<table><tr><td>3</td><td>3</td><td>1</td><td>1</td></tr><tr><td>4</td><td>3</td><td>4</td><td>3</td></tr><tr><td>4</td><td>4</td><td>1</td><td>1</td></tr><tr><td>4</td><td>4</td><td>1</td><td>1</td></tr></table>	3	3	1	1	4	3	4	3	4	4	1	1	4	4	1	1	
3	3	1	1															
4	3	4	3															
4	4	1	1															
4	4	1	1															
	OR																	
	(c) Explain following procedure: Region spitting and region merging	07																
Q.3	(a) Articulate functioning of Butterworth high pass filter.	03																
	(b) Devise the way to handle salt and pepper noise?	04																
	(c) Explain Gray level slicing and Bit plane slicing	07																
	OR																	
Q.3	(a) Summarize the process to detect point from an image?	03																
	(b) Articulate following terms: Binary image, gray scale image, RB image, Index image	04																
	(c) Describe various properties of DFT	07																
Q.4	(a) Illustrate the way to detect discontinuity in image using gradient.	03																
	(b) Discuss at least two distance measure with suitable diagram and formula.	04																
	(c) How edge differs from boundary? Discuss various operator for edge extraction.	07																
	OR																	
Q.4	(a) Define the term: Radiance, Luminance, Brightness	03																
	(b) Sketch the working of Hough transform.	04																
	(c) Illustrate various low pass frequency domain filters.	07																
Q.5	(a) Write a short note on Arithmetic coding	03																
	(b) Write a short note on pseudo color image processing	04																
	(c) Explain different types of redundancy in image	07																

OR

- Q.5**
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|------------|--|-----------|
| (a) | Describe impulse noise model | 03 |
| (b) | Write a short note on CMY and RGB color models | 04 |
| (c) | Apply Huffman coding to determine the code for following data: {a, b, c, d, c, c, b, a, a, a, a, d, c, b, c, d, a, c, e, e, e, e, b} | 07 |
