

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2022****Subject Code:3170308****Date:05-01-2023****Subject Name:Biomedical Image Processing****Time:10:30 AM TO 01:00 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) Explain Addition of two 3×3 gray scale images with example.	03
(b) Explain Sobel operator with example.	04
(c) Explain image acquisition system in detail	07
Q.2 (a) Explain image negative of 3×3 gray scale image.	03
(b) Explain Histogram equalization on 3 bit 10×10 gray scale image.	04
(c) Explain point, line and edge detection for image segmentation.	07
OR	
(c) Explain linear hough transform in detail.	07
Q.3 (a) Explain bit plane slicing of 3 bit gray scale image.	03
(b) Describe CMOS and CCD image sensor.	04
(c) Explain opening and closing of binary image with example.	07
OR	
Q.3 (a) Explain thresholding technique for image segmentation.	03
(b) Explain image moments.	04
(c) Explain region based segmentation techniques.	07
Q.4 (a) Describe lossy and lossless image compression. Give list of image compression techniques.	03
(b) Explain laplacian filtering with example.	04
(c) Explain Huffman coding technique for image compression.	07
OR	
Q.4 (a) Explain LOG operator.	03
(b) Explain K-means clustering with example.	04
(c) Explain hit or miss transform with binary image.	07
Q.5 (a) Define: image, pixel resolution, sensor resolution.	03
(b) Explain intensity slicing of 3×3 gray scale image.	04
(c) Explain 4 direction and 8 directional chain code with example.	07
OR	
Q.5 (a) Explain averaging filtering on 3×3 gray scale image	03
(b) Write steps for image filtering in frequency domain.	04
(c) Explain low pass filtering in frequency domain.	07
