Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2025

Subject Code:3170308 Date:21-05-2025

Subject Name:Biomedical 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)**	Draw and explain image formation in human eye.	**03**
	(b)	Differentiate between major image sensors.	**04**
	(c)	Explain RGB, HSI and CMYK models.	**07**
Q.2	**(a)**	Explain intensity slicing.	**03**
	(b)	Explain derivative based Edge detection.	**04**
	(c)	Explain image acquisition process in detail.	**07**
		OR	
	(c)	Perform following operations on following image. 1) Image Negative 2) gamma correction (gamma=0.8)	**07**

128	100	100	104	105
120	129	128	100	100
134	128	100	100	201
120	145	129	128	100
100	104	105	201	245

Q.3	**(a)**	Explain applications of morphological image processing.	**03**
	(b)	Explain frequency domain low pass filters.	**04**
	(c)	Explain Histogram equalization technique with example.	**07**
		OR	
Q.3	**(a)**	Explain pruning and its applications.	**03**
	(b)	Explain Convex hull with its applications.	**04**
	(c)	Perform Hit or Miss on following image (A) and structural element (X).	**07**

0	1	0	0	1	1
1	1	1	1	1	1
0	1	0	0	1	0
0	0	0	1	1	1
1	1	1	0	1	0

(A)

X	1	X
1	1	1
0	1	0

(B)

Q.4	**(a)**	Give difference between thickening and thinning process.	**03**
	(b)	Explain boundary extraction method.	**04**
	(c)	Perform opening and closing of image on following image and structural element.	**07**

0	1	0	0	1	1
1	1	1	1	1	1
0	0	0	0	1	0
0	0	0	1	1	1
1	1	1	0	0	0

(A)

0	1	0
1	1	1
0	0	0

(B)

OR

Q.4	**(a)**	Explain applications of Global and Adaptive thresholding.	**03**
	(b)	Explain formulation of K-means clustering.	**04**
	(c)	Explain Linear Hough transform with example.	**07**
Q.5	**(a)**	Describe image moments.	**03**
	(b)	Draw and explain compression image compression model.	**04**
	(c)	Explain various region based segmentation with examples.	**07**

OR

Q.5	**(a)**	Give difference between Lossless and Lossy compression.	**03**
	(b)	Explain usage of Chain code.	**04**
	(c)	Explain variable length coding with suitable example.	**07**

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