Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(Old course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 1720104 **Date: 11/12/2015**

Subject Name: Digital Image Processing

Time:2:30 pm to 5:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Briefly explain following terms related to digital image processing 1. Sampling 2. Quantization 3. Bilinear interpolation 4. Bicubic interpolation	**07**
	(b)	Briefly explain Histogram and its applications in image enhancement. Why histogram equalization is required? Prove that PDF of equalized image is constant in continuous domain	**07**
Q.2	**(a)**	Briefly explain intensity-level slicing and bit-plane slicing with its applications in image enhancement	**07**
	(b)	Briefly explain median, max and min filters with their applications in image enhancement.	**07**
		OR	
	(b)	Briefly explain sharpening filters	**07**
Q.3	**(a)**	Compare spatial domain and frequency domain filtering. State and prove convolution theorem showing the relation between spatial domain filtering and frequency domain filtering.	**07**
	(b)	Briefly explain a model of the image restoration. Also represent restoration process with equation in spatial and frequency domain.	**07**
		OR	
Q.3	**(a)**	Find the Fourier transform of impulse located at t=t0. Briefly explain the properties of 2D Discrete Fourier transform	**07**
	(b)	Briefly explain Inverse filtering and Wiener filtering as restoration techniques	**07**
Q.4	**(a)**	Briefly explain Pseudo-color and Full-color image processing	**07**
	(b)	Briefly explain 1. Morphological filter 2. Morphological Gradient 3. Morphological boundary extractor	**07**
		OR	
Q.4	**(a)**	Briefly explain Top-hat and bottom-hat transformations with their applications	**07**

Q.4	**(b)**	Define local threshold, global threshold and adaptive threshold. Briefly explain an algorithm to find global threshold.	**07**
Q.5	**(a)**	Briefly explain Canny edge detection algorithm	**07**
	(b)	Briefly explain Chain code to represent boundary. Find the normalized starting point of the chain code 11076765543322. Compute the first difference of the code 11076765543322.	**07**

OR

Q.5	**(a)**	Briefly explain Fourier descriptors and statistical moments as boundary descriptors	**07**
	(b)	Briefly explain following object recognition techniques 1. Minimum distance classifier 2. Correlation	**07**

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