## GUJARAT TECHNOLOGICAL UNIVERSITY ME – SEMESTER-1 (OLD) EXAMINATION – WINTER 2016

Sul	oject Code: 714104N	Date:21/11/2016			
Sul Tin Inst	Dject Name: Digital Image 1 ne:10:30 Am to 1:00 Pm ructions: 1. Attempt all questions. 2. Make suitable assumpti 3. Figures to the right indi	Processing and Applica ons wherever necessary. cate full marks.	ntions To	tal Marks: 70	
Q.1	Attempt All			14	
1	Which of the Following is th a) Uniform	e nonlinear filter b) Guassian	c) median	d) Triangular	
2	Which of the Following is th a) wiener filter	e restoration process b) Median filter	c) Digital Negative	d) Thresholding	
3	Homomorphic filtering does a) exponential operation	not include b) logarithmic operation	c) forward transform	d) Mask processing	
4	Which of the following is no a) pruning	t a morphological operat b) erosion	tion c) least squares	d) thinning	
5	Which of the following color a) YCbCr	space conversion is used b) YUV	d in JPEG c) HIS	d) YPbPr	
6	White color in a 8-bit grayscal a) 256	ale image is represented b) 255	by c) 0	d) 8	
7	An 8-bit color image of M ro a) MxNx3	ows and N columns is rep b) MxNx3x8	presented by c) NxMx3	d) MxNx8	
8	If you rotate the image by 45 applying DFT in frequency d a) 90	5 degree in spatial doma lomain (in degree) is b) 45	in, the rotation you c) 90	would observe after d) -45	
9	Sampling of an does a) color change of an image	b) discretization of spatial coordinates	c) smoothing of an image	d) sharpening of an image	
10	Which one of these is not a transformed to a transformed to a second contract the second contract of the second co	ype of image b) gif	c) png	d) wmv	
11	Intensity range of a 8-bit gray a) 0 to 255	yscale image is b) 0 to 256	c) 0 to 8	d) 0 to 7	
12	Spatial resolution is				

	a) :	function of sampling	b) quant	function tization	of	c) hist mo	function cogram deling	of	d) smoo	function othing filte	of r
13	Th wh a)	ere is a red pixel in an RG nat is the value of that pixel R = 255, G=0, B=0	B image. If we represent b) R=127, G=127, B= 0			tt RGB into separate c)R=255, G=127, B=0			e R, G, and B plane d) R=255, G=255, B= 255		ane 255,
14	Wl a)	hich one of the following d contrast enhancement	loes not increase the dyn b)histogram stretching			amic range of intens c) Thresholding			sity in the image d)histogram equalization		)
Q.2	(a)	Explain Histogram Equ	alizat	ion.							07
•	<b>(b)</b>	) Explain Region Split and Merge							07		
		OR									
	<b>(b</b> )	Explain any two point processing Techniques with expressions.							07		
Q.3	(a) Define Resolution and Explain Spatial and Gray Scale Resolution.						07				
	(b) Explain (1) Erosion (2) Dilation (3) Opening (4) Closing							07			
Q.3	(a)	a) Explain the concept of frequency domain filtering.						07			
	<b>(b)</b>	b) Explain region growing and region splitting.						07			
Q.4		List and explain types of Redundancies and Explain JPEG in Detail. 14							14		
Q.4		Write expression for RGB to YCbCr conversion and Write expression for RGB to 1 HSI conversion							14		
Q.5	(a)	Explain homomorphic filt	ering								07
	(b)	Write difference between	Image	Restoration	and	Imag	e Enhance	ment	t. Drav	w Image	07

degradation and restoration model.

OR

Q.5 Illustrate the histogram equalization and intensity distribution for a 3 bit image 14 of size 64x64 pixel having 8 intensity levels.

r <sub>k</sub>	r <sub>0</sub>	r <sub>1</sub>	$\mathbf{r}_2$	r <sub>3</sub>	$r_4$	r <sub>5</sub>	$r_6$	$\mathbf{r}_7$
n	790	1023	850	656	329	245	122	81
k								

Where rk is an intensity level and nk is the number of pixel having intensity value rk .The image has intensity levels in the range of [0, 7].

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