Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2724112 Date: 11/12/2015

Subject Name: Digital Video 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)**	Explain the digital video standards in brief. State the benefits of digital video representation.	**07**
	(b)	Explain the two-dimensional rectangular sampling. Also derive the discrete space Fourier transform relations.	**07**
Q.2	**(a)**	Explain geometric image formation.	**07**
	(b)	Explain the process to reconstruct the signal from rectangular samples and from samples on a lattice.	**07**
		OR	
	(b)	Explain the process of interpolation and decimations with appropriate sketches. Also discuss how sampling rate of a rational factor can be achieved.	**07**
Q.3	**(a)**	Briefly describe the Occlusion problem and Aperture problem in motion estimation.	**07**
	(b)	Describe the factors by which optical flow differs from the 2-D velocity. Also derive the optical flow equation.	**07**
		OR	
Q.3	**(a)**	Explain the phase correlation method to estimate the relative shift between the two image blocks. Also discuss its implementation issues.	**07**
	(b)	Explain Netravali-Robbins Algorithm for motion estimation.	**07**
Q.4	**(a)**	List out the models constituting the MAP estimate, discuss the difficulties in minimizing the potential function and hence state the Konrad-Dubois method.	**07**
	(b)	Explain direct methods for (i) Motion segmentation using mapping parameters. (ii) Motion segmentation using thresholding for change detection	**07**
		OR	
Q.4	**(a)**	Explain region tracking in detail.	**07**
	(b)	Explain Still frame stereo imaging.	**07**
Q.5	**(a)**	Explain Sub-Nyquist spatio temporal sampling on a spatio temporal lattice.	**07**
	(b)	Explain the motion tracking with monocular video in detail.	**07**
		OR	
Q.5	**(a)**	What are critical velocities? Discuss in detail.	**07**
	(b)	Explain 2-D trajectory model and discuss token tracking in brief.	**07**

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