Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II (Old course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 1724104 **Date:14/05/2015**

Subject Name: Digital Video Processing

Time: 02:30 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)**	Describe perspective projection in detail.	**07**
	(b)	Explain the need of digital video over analog video. Briefly explain various digital video standards.	**07**
Q.2	**(a)**	Briefly describe the occlusion and aperture problem in motion estimation.	**07**
	(b)	Derive the equation of rotation matrix with Eulerian angles in Cartesian co-ordinate system for rigid object.	**07**
		OR	
	(b)	Derive the equation that relates Fourier Transform of sampled signal $S_p(F_1,F_2)$ to that of Fourier Transform of continuous signal $S_c(F_1,F_2)$ for rectangular sampling.	**07**
Q.3	**(a)**	Explain Wiener-estimation based method for block motion with suitable equations.	**07**
	(b)	Explain reconstruction of sampled signal from rectangular samples with suitable equations.	**07**
		OR	
Q.3	**(a)**	Explain gradient estimation using finite differences and gradient estimation by local polynomial fitting approach in detail.	**07**
	(b)	Explain Netravali-Robbins algorithm for motion estimation.	**07**
Q.4	**(a)**	Derive the relationship between minimization of the Displaced Frame Difference (DFD) and Optical Flow Equation (OFE)?	**07**
	(b)	Briefly explain Phase Correlation method and it implementation in computer hardware.	**07**
		OR	
Q.4	**(a)**	Write short note on gradient based optimization.	**07**
	(b)	Write short note on Horn & Schunck method.	**07**
Q.5	**(a)**	Briefly describe direct methods for motion segmentation using spatio-temporal intensity and gradient information.	**07**
	(b)	Explain the Bayesian segmentation algorithm in detail.	**07**
		OR	
Q.5	**(a)**	Write short note on sub-Nyquist spatio-temporal sampling.	**07**
	(b)	Write short note on motion tracking.	**07**

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