

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016**

**Subject Code: 2724112****Date: 31/05/2016****Subject Name: Digital Video Processing****Time: 10:30 am to 01:00 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) Write a short note on analog video standards. Also draw and explain the spectrum of NTSC video signal. **07**
- (b) Explain rigid motion in Cartesian Coordinates and also derive the 3-D velocity model to represent the instantaneous velocity of a point in 3-D space. **07**
- Q.2** (a) Explain photometric image formation in detail. **07**
- (b) Discuss 2-D rectangular sampling in detail. **07**
- OR**
- (b) Explain the process of reconstruction of signal from rectangular samples. Also discuss the same for samples on a lattice. **07**
- Q.3** (a) Describe the Horn and Schunck method for OFE **07**
- (b) Explain Netravali-Robbins Algorithm for motion estimation. **07**
- OR**
- Q.3** (a) Explain decomposition of sampling structure conversion system. What is meant by de-interlacing? **07**
- (b) What are the problems associated with 2-D motion estimation? Discuss in detail. **07**
- Q.4** (a) Discuss the implementation issues of phase correlation method. Also discuss the desirable properties of phase correlation method. **07**
- (b) Discuss the relationship between the minimization of displaced frame distance and the optical flow equation. **07**
- OR**
- 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) Describe two block motion models namely translational and deformable block motion. **07**
- Q.5** (a) Explain still frame stereo imaging with a neat descriptive diagram. **07**
- (b) Explain token tracking for 2-D motion **07**
- OR**
- Q.5** (a) Define motion trajectory. Derive the spatio temporal spectrum of video having global motion with constant velocity. **07**
- (b) Discuss the process of filtering along arbitrary motion trajectories in brief **07**

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