

MANIPAL INSTITUTE OF TECHNOLOGY

SIXTH SEMESTER B.TECH. (PRINT AND MEDIA TECHNOLOGY)

END SEMESTER EXAMINATIONS, APR/MAY 2017

SUBJECT: VIDEO PROCESSING [PMT 3202]

REVISED CREDIT SYSTEM

(25/04/2017)

TIME: 3 HOURS

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitably assumed.
- **1A.** Explain the difference between Progressive scan and Interlaced scan with relevant diagrams.
- **1B.** For the given RGB coordinates (255, 255, 0) find the YCbCr values.
- **1C.** What are the coordinates of the 8-neighbours of a pixel (x, y)?

[05 + 03 + 02]

2A. An image matrix I is given. Equalise the Histogram of I and then scale it to [1 – 10].Plot the Histogram of the original image and the equalised image.

$$I = \begin{bmatrix} 3 & 2 & 4 & 5 \\ 7 & 7 & 7 & 2 \\ 3 & 1 & 2 & 3 \\ 5 & 4 & 6 & 7 \end{bmatrix}$$

- **2B.** What do you mean by Gamma correction? Explain its significance.
- **2C.** Explain the difference between Histogram equalisation and Histogram matching.

[05 + 03 + 02]

- **3A.** Symbols a, b and c has probabilities of 0.4, 0.3, 0.3 respectively. Find the code for the word abac, using Arithemetic coding.
- **3B.** Explain the waveform of a raster scan.
- **3C.** State Bloch's law.

[05+03+02]

- **4A.** Compute graphically, the 2D convolution of $x = \begin{bmatrix} 4 & 5 & 6 \\ 1 & 2 & 3 \end{bmatrix}$ and $h = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$. Obtain the output matrix.
- 4B. Draw a CIE chromaticity diagram. Explain its importance.
- 4C. List the difference between the terms Optical flow and Motion estimation.

[05+03+02]

- **5A.** With relevant graphs, explain the temporal frequency response of Human Visual system. How is it affected by the mean brightness? What is the significance of the same?
- **5B.** State Sampling theorem.
- **5C.** An image is represented by $\models \sin(10\pi x + 20\pi y)$. What should be the sampling frequency so as we can reconstruct it properly?

[05+03+02]