



M.Tech II Semester Supplementary Examinations January/February 2019

DIGITAL IMAGE & VIDEO PROCESSING

(Common to DECS, DSCE, ES, VLSI&ES, ES&VLSI and VLSI&ESD)

(For students admitted in 2017 only)

Time: 3 hours

Max. Marks: 60

Answer all the questions

- 1 (a) Show that the F.T of convolution of two functions is the product of their Fourier transforms.
(b) Differentiate uniform and non uniform sampling.
(c) Obtain the Haar transform matrix for $N = 8$.

OR

- 2 (a) Discuss about Walsh transform.
(b) What is energy compaction property? Derive the Kernel coefficients of $N=8$ of DCT.
(c) Discuss about CWT and its applications.
- 3 (a) Explain the following: (i) A model to determine edges. (ii) Histogram equalization.
(b) Explain the steps in morphological processing when an image is corrupted by noise, where the original image objects are much larger in size than the noise.

OR

- 4 (a) What is meant by region based segmentation? Discuss about region growing.
(b) Explain the following: (i) Image registration. (ii) Contrast stretching.
- 5 (a) Explain why deterministic grammars are too restrictive for description of real-world textures.
(b) Explain how the chain code boarder representation is done. Give an example.

OR

- 6 (a) Explain the following: (i) Euler's number for shape descriptors. (ii) Fine and coarse textures.
(b) Give a scheme/algorithm for computing co-occurrence matrix.
- 7 (a) Explain the maximum likelihood algorithm for pattern classification.
(b) Classify the $X = (6, 5)$ into any one of the three classes characterized by the following decision function:

$$d_1(x) = -x_1 + x_2, \quad d_2(x) = x_1 + x_2 - 5, \quad d_3(x) = -x_2 + 1$$

OR

- 8 (a) Explain a cluster-seeking algorithm in detail.
(b) Classify the pattern $x = (4, 3)$ into any one of the three classes characterized by the following decision function:

$$d_{12}(x) = -x_1 - x_2 + 5, \quad d_{13}(x) = -x_1 + 3, \quad d_{23}(x) = -x_1 + (-x_2)$$

- 9 (a) What is a frame in a video? How it is related and helps in background subtraction?
(b) What is meant by optical flow? Illustrate the block matching algorithm to find motion vector.

OR

- 10 (a) Discuss about static and dynamic back ground modeling.
(b) Discuss about the procedure handle occlusion. What is the purpose of it?

