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10TE754

Seventh Semester B.E. Degree Examination, Jan./Feb.2021

Image Processing

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. What is digital image? With a neat block diagram, explain the functions of various components used in general purpose image. (10 Marks)
- b. With a neat diagram, explain the formation of an image in an eye with an illustration. (05 Marks)
- c. Explain the importance of brightness adaptation and discrimination in image processing. (05 Marks)
- 2 a. Explain : i) False contouring ii) Checker board effect iii) Adjacency
iv) Distance measures (12 Marks)
- b. Let p and q be the pixels at coordinates (15, 7) and (8, 20) respectively. Find out chess board distance between the pixels. (04 Marks)
- c. Find the time required in seconds to transmit an image of size 3" × 3.5" scanned at 200 DPI at 28 KBPS speed. (04 Marks)
- 3 a. Explain KL transform and its any three properties. (12 Marks)
- b. Obtain the Haar transform matrix for N = 8. (08 Marks)
- 4 a. Explain Haar transformation with its properties. Find 2 × 2 Haar matrix. (10 Marks)
- b. Discuss advantages and applications of the following transforms : i) Cosine ii) Slant
iii) Hadmard iv) Haar v) KL. (10 Marks)

PART – B

- 5 a. In histogram equalization, show that the probability density functions of transformed O/P gray level. $P_S(S)$ is uniform and independent of the form $P_r(r)$ [Probability density function of input grey level]. (08 Marks)
- b. Explain the following : i) Gray level slicing ii) Bit plane slicing iii) Contrast stretching. (08 Marks)
- c. Briefly explain how image subtraction is used for image enhancement. (04 Marks)
- 6 a. Explain the basic concept of spatial filtering for image enhancement. Explain smoothing and median filters in detail. (10 Marks)
- b. With the help of block diagram, explain homomorphic filters for image enhancement. (10 Marks)
- 7 a. Explain the model of image degradation / restoration. (10 Marks)
- b. Explain observation and experimentation ways to estimate the degradation function. (10 Marks)
- 8 a. Explain RGB and HIS colour models. (10 Marks)
- b. What is pseudo colour image processing? Explain intensity level slicing of assigning pseudo colours. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8 = 50$, will be treated as malpractice.