NEC - 032

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2289465   Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

B.TECH

Regular Theory Examination (Odd Sem - VII), 2016 - 17

DIGITAL IMAGE PROCESSING

Time : 3 Hours   *Max. Marks : 100*

SECTION - A

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short.   (10×2=20)

   a) Define an image with spatial coordinates.

   b) Name some types of Image file formats.

   c) Generate hadamard matrix of 2nd order by Kronecker product.

   d) List the drawbacks of wiener Filter

   e) Mention some of the filters to reduce various noises in an Image.

   f) Compare Noisy image and Blurred image.

   g) Differentiate Reversible compression and irreversible compression.

h) Give the operating modes of JPEG format.

i) Identify the problems in region based segmentation.

j) How to determine the number of clusters in k-means segmentation algorithm?

SECTION - B

2. **Note: Attempt any five questions from this section**
(5×10=50)

a) Summarize the concept of image processing components with simple block diagram.

b) Write a technical note on image analysis with an example.

c) State the convolution and correlation properties of 2D Fourier transform.

d) Design a filter to avoid Speckle noise with an example.

e) Compare RGB image, Gray scale image and Binary image.

f) Classify the segmentation process with an example.

g) Draw a neat block diagram for JPEG compression.

h) How to detect a lines using Hough transform.

SECTION - C

Note: Attempt any two Questions from this section.
(2×15=30)

3. Compute the Haar basis for $N = 4$ and interpret the reason for multiplied power of $\sqrt{2}$

4. a) Derive the expression for inverse filtering. **(8)**

   b) How to avoid aliasing effect in an image. **(7)**

5. Explain the concepts behind data hierarchy, frame construction, Motion Estimation, and audio compression in MPEG Standard in detail with necessary expression and diagrams.

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