8E4092

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B. Tech. VIII Sem. (Main/Back) Exam., April, 2015
Electronics & Communication
8EC4.1 Image Processing & Pattern Recognition
Common for 8EC4.1, 8EI4.3, 8AI4.1, 8BM4.3 & EX4.2

Time: 3 Hours **Maximum Marks: 8(**

Min. Passing Marks: 2(

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All question carry **equal** marks. Schematic diagrams must be shown wherever necessary. An data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. NIL 2. NIL

UNIT – I

Q.1 (a) State visible and infrared bands (in terms of wavelength) along with thei respective characteristics and uses in context to multispectral imaging. [8

(b) Discuss mechanism by which creating and readout of an image is done b CCD. [8

OR

Q.1 (a) Compare CCD and CMOS image sensors in tabulated from by taking importar parameters one by one. [8

(b) Discuss various types of scanning mechanisms for converting analog images int digital images. [8

UNIT – II

Q.2 (a) Discuss the concept of Aliasing in digital images. [8]

(b) How do you differentiate spatial resolution with gray level resolution? [8]

OR

Q.2 (a) Discuss Bilinear interpolation in context to its role in image resizing. [8]

(b) Discuss Moire pattern by taking suitable example. [8]

UNIT – III

Q.3 (a) Discuss Gaussian, uniform and salt–and–pepper noise in context to digital images, Draw the Histograms of these noises. [6+3=9]

(b) A 4 × 4 image is defined as

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

Calculate the output after filtering of given image using a 3 × 3 neighbourhood averaging, assume the image is padded with zero along the edges. [7]

OR

Q.3 (a) Compute the median value of the marked pixels as shown in fig using a 3 × 3 mask. [5+5=10]

$$\begin{bmatrix} 18 & 22 & 33 & 25 & 32 & 20 \\ 30 & (120) & 20 & (160) & 20 & 29 \\ 25 & 17 & 27 & 31 & 28 & 24 \end{bmatrix}$$

(b) Discuss Adaptive median filter in context to image filtering. [6]

UNIT – IV

Q.4 (a) Compare Lossless and Lossy image compression by giving suitable example. [10]

(b) How doyen differentiate source coding with channel coding? State the objective of these two coding. [6]

OR

Q.4 (a) Discuss one lossy image compression standard in detail. [8]

(b) Give relationship between RGB and HSI Color space formats. [8]

UNIT – V

Q.5 Discuss pattern matching in detail in context to digital images. [16]

OR

Q.5 Discuss finger print recognition system by mentioning key methods for classification. [16]
