8E 8162

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**B.Tech. VIII Semester (Main&Back) Examination, April - 2019**
**Computer Science & Engg.**
**8CS2A Digital Image Processing**
**Commom with CS,IT**

**Time : 3 Hours** **Maximum Marks : 80**
**Min. Passing Marks : 26**

***Instructions to Candidates:***

*Attempt any **Five questions**, selecting **One question** from **each unit.** All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly).*





**Unit - I**

1. a) What are the basic components of an image processing system? Explain all the components with block diagram. Write down the three example of field that uses digital Image processing. **(12)**

   b) Explain different types of mathematical tools which are used in digital image processing. **(04)**

**(OR)**

1. a) Explain the importance of brightness adaptation and discrimination in Image processing. **(06)**

   b) What are the applications of Image processing? Explain components of Image processing. **(06)**

   c) Differentiate Image quantization and scalar quantization. **(04)**

**Unit - II**

2. a) List out the properties of 2D Fourier transform. Explain spatial filtering. **(08)**

   b) Describe histogram equalization. Obtain Histogram equalization for the following image segment of size 5×5. Write the interface on image segment before and after equalization. **(08)**

**(OR)**

2. a) Describe the basic principles of Image enhancement by
   i) Spatial domain method
   ii) Frequency domain methods. **(2×4=8)**
   b) Explain about convolution and correlation properties of the 2D FFT. **(08)**

**Unit - III**

3. a) Write short note on **(any two)**
   i) Holomorphic filter
   ii) Inverse filter
   iii) Weiner filter **(2×4=8)**
   b) Explain the expression for observed image when the degradation are linear, position invariant. **(08)**

**(OR)**

3. a) What is Image restoration model? Explain paint and spatial Image restoration models. **(08)**
   b) Define the process of restoration. Explain any four important noise probability density functions. **(08)**

**Unit - IV**

4. a) Draw a Image compression model and describe the work of each block. **(08)**
   b) What are the basic steps in JPEG compression? Explain. **(08)**

**(OR)**

4. a) Write short note on :-
   i) Coding redundancy
   ii) Inter pixel redundancy **(2×4=8)**
   b) Explain Lossy and Lossless coding techniques. **(08)**

**Unit - V**

a) Describe the segmentation process in digital Image processing. Explain the fundamental of edge based segmentation. **(06)**

b) Explain the region growing method for segmentation in Image processing. **(04)**

c) Discuss gradient operators. Write 3×3 region two dimensional sobel mask and express their partial derivative equations. **(06)**

**(OR)**

a) Explain the technique of thresholding for segmentation. **(08)**

b) Describe how hough transform used for boundary shape detection. **(08)**