

Code No: 07A70507

R07**Set No. 2****IV B.Tech I Semester Examinations, NOVEMBER 2010****IMAGE PROCESSING****Information Technology****Time: 3 hours****Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) List the different components of a general purpose image processing system and explain.
 (b) For transmission of digital data the common measure is baud rate, defined as number of lists transmitted per second. Using this fact answer the following.
 i) How many minutes would it take to transmit a 1024×1024 image with grams levels using a 56k baud modem.
 ii) What would the time be at 150K baud a representative speed of a DSL phone connection. [16]
2. (a) Explain about Role of illumination?
 (b) Define and Explain about Multi-level thresholding? [8+8]
3. (a) Explain the following Arithmetic operations and their application for Image Enhancement i) Image Subtraction ii) Image Averaging.
 (b) Explain how Region of Interest processing can be done using logic operations. [10+6]
4. (a) Explain about histogram processing for color Images.
 (b) Consider any two valid colors C_1 & C_2 with coordinates $(x_1 \ y_1)$ & $(x_2 \ y_2)$ in the chromaticity diagram. Derive the necessary general expressions for computing the relative percentages of colors C_1 & C_2 composing a given color that is known to lie on the straight line joining these two colors. [16]
5. (a) Define and Explain about Hyperplane?
 (b) Explain about matching by correlation? [8+8]
6. Explain about the following Geometric Transformations.
 a) Spatial Transformation
 b) Gray level Interpolation. [16]
7. How would you convert an image from a square grid to a hexagonal grid? [16]
8. Define lossy predictive coding and explain with suitable examples? [16]

Code No: 07A70507

R07**Set No. 4**

IV B.Tech I Semester Examinations, NOVEMBER 2010
IMAGE PROCESSING
Information Technology

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. Explain in detail about the following color models:
 - a) RGB
 - b) HSI
 - c) CMY. [16]
2. (a) Define autocorrelation coefficients?
 (b) Explain about Psychovisual Redundancy? [8+8]
3. (a) Explain about Role of illumination.
 (b) Define and explain about back ground point? [8+8]
4. (a) Explain in detail about different types of order statistics filters for Restoration.
 (b) Name different types of estimating the degradation function for use in image restoration and explain in detail estimation by modeling. [16]
5. Explain in detail the working of following smoothing spatial filters & compare
 a) Averaging filter b) Median filter. [16]
6. (a) Define and Explain about Convergence?
 (b) What is Convex-Hull and explain about Convex-Hull? [8+8]
7. (a) Explain briefly about Neurons?
 (b) Explain about Training Set? [8+8]
8. Consider the image segment shown
 - (a) Let $V=\{0,1\}$ and compute the lengths of shortest 4- ,8- and m-path between p and q. If a particular path does not exist between these two points, explain why it is so.
 - (b) Repeat for $V =\{1,2\}$
 - 3 1 2 1 (q)
 - 2 2 0 2
 - 1 2 1 1
 - (p) 1 0 1 2 . [16]

Code No: 07A70507

R07**Set No. 1**

IV B.Tech I Semester Examinations, NOVEMBER 2010
IMAGE PROCESSING
Information Technology

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain in detail the spatial domain Restoration using following mean filters.
 - i) Arithmetic.
 - ii) Harmonic.
 - iii) Contraharmonic.
 (b) If the transform function for degradation is $H(u,v) = -2\sqrt{2\pi}\sigma(u^2+v^2)e^{-2\pi^2\sigma^2(u^2+v^2)}$ then give the expression for wiener filter. Assuming that the ratio of power spectra of noise and undegraded signal is constant. [16]
2. (a) Define and Explain about directed graph?
 (b) Define and Explain about expansion of the node? [8+8]
3. (a) Explain how image processing is used in visible and Infrared Bands.
 (b) Explain the reasons for the following:
 - i) Checker board patterns.
 - ii) False contouring.
 - iii) Moire patterns. [16]
4. (a) Explain about Training Patterns?
 (b) Explain briefly about Neurons? [8+8]
5. (a) Explain about thickening?
 (b) Explain about Skeletons? [8+8]
6. (a) Consider any three valid colors C_1, C_2 & C_3 with coordinates $(x_1, y_1), (x_2, y_2)$ & (x_3, y_3) in the chromaticity diagram. Derive the necessary general expressions for computing the relative percentages of colors C_1, C_2 & C_3 composing a given color that is known to lie with in the triangle whose vertices are at the coordinates C_1, C_2 & C_3 .
 (b) How many different shades of gray are there in a color RGB system in which each RGB image is an 8-bit image. [12+4]
7. (a) Give the mask & explain the technique of high-boost filtering.
 (b) Explain in detail the use of first derivative for Image enhancement. [16]
8. (a) Explain about CAC and WBS?
 (b) Explain about Run-Length coding with neat examples and diagrams? [8+8]

Code No: 07A70507

R07**Set No. 3**

IV B.Tech I Semester Examinations, NOVEMBER 2010
IMAGE PROCESSING
Information Technology

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain about Basic adaptive thresholding?
 (b) Explain about optional global and Adaptive thresholding? [8+8]
2. (a) Explain about activation function.
 (b) Explain briefly about an augmented pattern vector? [8+8]
3. Explain in detail with block diagram the fundamental steps in digital Image processing and their importance. [16]
4. (a) Explain in detail different methods of implementation of Laplacian.
 (b) Show that the magnitude of gradient i.e. $f = \left[\left(\frac{\partial f}{\partial x} \right)^2 + \left(\frac{\partial f}{\partial y} \right)^2 \right]^{1/2}$ is isotropic operation. [16]
5. Explain in detail the constrained least squares filtering with related expressions. [16]
6. (a) Explain briefly about Lavg and RD value for coding redundancy?
 (b) Explain about grey-level histogram? [8+8]
7. (a) Derive the CMY transformations to generate the complement of a color image.
 (b) Explain in detail about color image smoothing & sharpening. [16]
8. (a) Explain about extensions to Gray-scale images?
 (b) Define pruning and explain about it? [8+8]
