Code No: R05410408 **Set No. 1**

IV B.Tech I Semester Regular Examinations, November 2008
DIGITAL IMAGE PROCESSING
(Electronics & Communication Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the process of Image acquisition.
   (b) Discuss different elements used in digital image processing system. [8+8]
2. (a) Find Fourier transform 2 -D sinusoidal function n(x,y) = A $\sin(u_0x + v_0y)$
   (b) Obtain the spectrum in above case. [10+6]
3. Discuss the limiting effect of repeatedly applying a 3X3 low pass spatial filter to a digital Image. You may ignore the border effects. [16]
4. Distinguish between spatial domain techniques and frequency domain techniques of Image enhancement. [16]
5. Write about how the colors are converted from RBG to HIS. [16]
6. Explain the following Order-Statistics Filters.
   (a) Max and min filters
   (b) Median filter
   (c) Alpha-trimmed mean filter. [16]
7. What is Thresholding? Explain about Global Thresholding. [16]
8. Consider an 8- pixel line of gray-scale data, {12,12,13,13,10,13,57,54}, which has been uniformly quantized with 6-bit accuracy. Construct its 3-bit IGS code. [16]

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Code No: R05410408 **Set No. 2**

IV B.Tech I Semester Regular Examinations, November 2008
DIGITAL IMAGE PROCESSING
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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. A common measure of transmission for digital data is the baud rate, defined as the number of bits transmitted per second. Generally, transmission is accomplished in packets consisting of starting bit, a byte of information, and a stop bit. Using this approach, answer the following.
   (a) How many minutes would it take to transmit a 512×512 image with 128 grey levels at 300 baud?
   (b) What would the time be at 9600 baud?
   (c) Repeat (a) and (b) for a 1024×1024 image 128 grey levels. [16]
2. Obtain Haar transform matrix for N=8. [16]
3. Discuss following histogram techniques for Image enhancement.
   (a) Histogram specification.
   (b) Local enhancement. [16]
4. Distinguish between spatial domain techniques and frequency domain techniques of Image enhancement. [16]
5. Explain in detail about the HIS and CMYK color spaces. [16]
6. The white bars in the test pattern shown in figure 6b are 7 pixels wide and 210 pixels high. The separation between bars is 17 pixels. What would this image look like after application of
   (a) A 3 × 3 geometric mean filter?
   (b) A 9 × 9 geometric mean filter? [16]

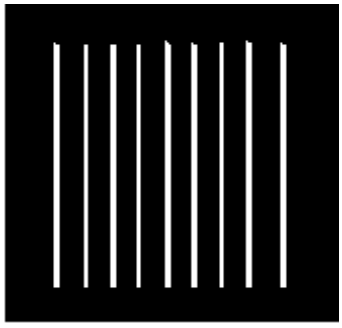

Figure 6b

7. (a) Find the edge Detection using function edge
   (b) Explain about Sobel edge Detector. [8+8]

8. Explain about the following:
   (a) Lossy compression
   (b) Lossy predictive coding. [8+8]

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Code No: R05410408 **Set No. 3**

IV B.Tech I Semester Regular Examinations, November 2008
DIGITAL IMAGE PROCESSING
(Electronics & Communication Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Show that the D4 distance between two points p and q is equal to the shortest 4-path between these points. Is this path unique? [16]
2. (a) Find Fourier transform 2 -D sinusoidal function n(x,y) = A $\sin(u_0x + v_0y)$
   (b) Obtain the spectrum in above case. [10+6]
3. Discuss following histogram techniques for Image enhancement.
   (a) Histogram specification.
   (b) Local enhancement. [16]
4. Discuss the frequency domain techniques of Image enhancement in detail. [16]
5. What are IPT functions? Explain how they are suitable for manipulating RBG and Indexed images. [16]
6. (a) What is a Image Formation Model.
   (b) Write about Various Image Observation Models with Examples. [8+8]
7. A binary image contains straight lines oriented horizontally, vertically, at 45^0 and at -45^0 give a set of 3×3 mask that can be used to detect 1-pixel-long brakes in these lines.assume that the gray levels of lines is one and that the gray level of the background is 0. [16]
8. (a) Draw and explain a general compression system model.
   (b) Draw the relevant diagram for source encoder and source decoder. [8+8]

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Code No: R05410408 **Set No. 4**

IV B.Tech I Semester Regular Examinations, November 2008
DIGITAL IMAGE PROCESSING
(Electronics & Communication Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Discuss few examples of how logical operations may be performed on Images. [16]
2. (a) Discuss the dynamic range compression property w.r.t 2D-DFT.
   (b) State and prove separability property of 2D-DFT. [8+8]
3. Discuss Image smoothing with the following
   (a) Low pass spatial filtering
   (b) Median filtering. [16]
4. Sketch perspective plot of an 2-D Ideal Low pass filter transfer function and filter cross section and explain its usefulness in Image enhancement. [16]
5. Explain about the CMY and CMYK color models in detail? [16]
6. Explain about Iterative Nonlinear Restoration Using the Lucy-Richardson Algorithm. [16]
7. Write about various edge Detectors available in function edge. [16]
8. (a) Draw and explain a general compression system model.
   (b) Draw the relevant diagram for source encoder and source decoder. [8+8]

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