Digital Image Processing Question Bank

UNIT -I

1) Describe in detail the elements of digital image processing system. & write note on Sampling and Quantization?

2) Write the Hadamard transform matrix Hn for n=3?

3) Mention the significant features of wavelet transform?

4) Discuss the salient features of Discrete Cosine transform?

5) What is meant by the Histogram of a digital image?

6) Write a note on Image sensing and Acquisition?

7) Explain about fundamental steps in digital image processing?

8) Explain the components of an Image Processing system?

9) a) Distinguish between digital image, and binary image. Give suitable example to each type of images.

   b) State and explain various applications of digital image processing

10) a) Explain the functioning of CCD line scan sensor and CCD area sensor.

   b) What is a frame buffer? Discuss the categories of digital storage for image processing applications.

11) Write Short Note on these various transforms:
    a) Walsh
    b) Hadamard
    c) Wavelet

12) What is m-connectivity among pixels? Give an example

13) What do you mean sampling? State Explain this into image processing?

14) What are the different transforms used in DIP? Explain the most advantageous one detail ?

15) Explain resolution with image processing .Also write on spatial level resolution?

16) What are the different elements of DIP system .Explain?

17) Explain with example a) Neighbors of pixel b) Connectivity

18) How many minutes would it take to transmit a 1024 * 1024 image with 256 gray levels using a 56k band modem? Explain it .

UNIT II

1. Discuss Image smoothing with the following
       (a) Low pass spatial filtering   (b) Median filtering.
2. Discuss in detail about Histogram Processing?
3. Write a note on basics of spatial filtering?
4. Write a note on
        a) Gray Level Transformations
        b) Combining Spatial Enhancement Methods
5.   Distinguish between spatial domain techniques and frequency domain techniques of Image enhancement
6. State and explain with suitable examples the arithmetic/logic operations among Pixels.
7.   (a) Explain about Histogram specification with necessary derivations
       (b) What is meant by local enhancement? Discuss its importance.
8.   (a) Show that a high pass-filtered image in the frequency domain can be obtained
          by using the method of subtracting a low pass filtered image from the original.
9.   (a) What is meant by image enhancement? Discuss the need for enhancement
       (b) Discuss the spatial domain methods for image enhancement.
10.   (a) Show that a high pass-filtered image in the frequency domain can be obtained
          by using the method of subtracting a low pass filtered image from the original.
11. Describe the concept of Histogram specifications and Histogram modification for image
       enhancement & discuss the role of nonlinear filters in image enhancement.
12. Explain process of image smoothing using Median filtering?
13. How first and second derivative enhance the image ? Explain which is more enhance?
14.An image segment is show below .let V be the set of gray level values used to define connectivity in the image .Compute D4 ,D8 and Dm distances between pixel p & q for
a) v = { 0,1}   b) v = {1,2}

p				q
3	1	2	1	q
2	2	0	2	
1	2	1	1	
p	1	0	1	2

15. Develop a procedure for computing the median of an n*n neighborhood .Propose a technique

    for updating the median as the center of the neighborhood is moved from pixel to pixel

16. Under what conditions does the butterworth low pass filter $H(u,v)=1/1+ [D(u,v)/Do]^{2n}$

becomes an ideal low pass filter ? Explain

17. Explain the discrete histogram equalization technique?

UNIT III

1. Discuss the salient features of Discrete Cosine transform?

2. Explain Huffman coding with an example and mention its salient features.& Describe the lossless predictive coding of images.

3. Discuss the image restoration process in linear algebraic approach.

4. (a) Draw and explain a general compression system model.

   (b) Draw the relevant diagram for source encoder and source decoder.

5. Explain the Image compression models.

6. Discuss on Error Free compression

7. Describe the various noise models

8. Explain the Image compression standards

9. (a) Discuss the functioning of source encoder and decoder in image Compression.

   (b) Explain about Huffman coding with suitable examples.

10. What are the different coding techniques used in DIP ? Explain any one

11. Explain Lossy Predictive coding Model?

12. Explain any image compression process in detail?

13. Determine which bit, if any, is in error in the hamming encoded message 1100111, 1100110 and 1100010.what are the decoded values?

UNIT IV

1. Explain about the CMY and CMYK color models in detail?

2. What is invariant degradation? Explain about estimating the degradation function?

3. Write a note on Geometric mean Filter.

4. Write a note on

a)Gray Level Transformations b)Spatial Enhancement Methods

5. Write about how the colors are converted from RBG to HIS

6. (a) Explain about RGB and CMY color models.

(b) Discuss the procedure for conversion from HSI to RGB color model.

7. (a) Explain the image degradation model for continuous functions

(b) Discuss about unconstrained, constrained restorations.

8. Draw the block diagram of Image restoration system & explain each block critically?

9. Explain the following Color models

a) RGB b) CMY c)HSI d) HIS

10. Explain the principle of pseudo color image processing

11. What are the different mean filters used for restoration? Explain any one.

12. Write note on   a) RGB   b) HIS

13. Explain the color conversion with appropriate method in detail.

14. Explain the spatial transformation in DIP

15. Write in detail gray level interpolation based on the nearest neighbor concept.

UNIT V

1. Explain the significance of Hough Transform .List the advantages over other transforms?

2. Explain the use of motion in segmentation?

3. Write about various edge Detectors available in function edge?

4. Explain any type of transform for the detection of line and curves?

5. Explain briefly

   a) Region based segmentation

   b) Use of Motion in segmentation

6. What is Thresholding? Explain about Global Thresholding.

7. Explain in detail the interactive restoration of an image.

8. Discuss about Global processing via the Hough Transform.

9. Discuss about unconstrained, constrained restorations.

10. Explain in detail the threshold selection based on boundary characteristics.

11. Discuss about Region growing by pixel aggregation.

12. Discuss about unconstrained, constrained restorations.

13. What is meant by image segmentations? Discuss various applications of it.

14. What is meant by discontinuities in an image? Discuss about point detection, line detection   ?

15. Explain global processing using Hough transform.

16. What are the different techniques for detection of discontinuous? Explain advantageous one only.

17. Write note on image segmentation in detail.

18. What are the gradient operation? What are the various operators used for image segmentation based on edge detection? Explain

19. What do you understand by dialation and erosion operation in morphological operation? Explain in brief?