EC8093 DIGITAL IMAGE PROCESSING

IMPORTANT QUESTIONS AND QUESTION BANK

UNIT-I DIGITAL IMAGE FUNDAMENTALS

2-Marks

1. Define image.
2. What is dynamic range?
3. Define brightness.
4. What do you mean by Gray level?
5. Define Digital image.
6. What is Digital image processing?
7. Define pixel.
8. What do you mean by Colour model?
9. What is Hue and saturation?
10. State Grass man's law.
11. Define image Quantization.
12. Define image sampling.
13. Define Contrast and Hue.
14. Define Resolutions.
15. What are the steps involved in DIP?

13-Marks

1. Explain the fundamentals steps in Digital image processing.
2. Explain the components of an image processing system.
3. Explain the principle and working of vidicon digital camera with neat diagram.
4. Explain the Element of Visual perception.
5. Explain the colour image fundamentals (models) with neat diagram.
6. Discuss the role of sampling and quantization in the context of image encoding applications.
7. Explain 2D sampling theory.
8. Explain Uniform Quantization and Non- Uniform Quantization.
9. Explain in detail the ways to represent the digital image.
10. Write a short note on: a) Neighbours of pixels b) distance measures c) connectivity d) Adjacency.

UNIT-II IMAGE ENHANCEMENT

2-Marks

1. Define Image Enhancement.
2. What are the two categories of Image Enhancement?
3. Write the transfer function for Butterworth filter.

4. Why the Image Enhancement is needed in image processing technique.
5. Mention the various Image Enhancement technique.
6. What is contrast stretching?
7. What is meant by histogram of a digital image?
8. What is Median filtering?
9. What do mean by point processing?
10. What are image negatives?
11. Write the steps involved in frequency domain filtering.
12. What is mean by Laplacian filter?
13. What is the purpose of image averaging?
14. What is meant masking?
15. Define clipping.

13-Marks

1. Explain Enhancement using point operations.
2. Explain briefly about histogram modeling.
3. Write a short note on histogram equalization and histogram modification.
4. Write short notes on histogram specification.
5. Write a short note on the various Noise models (Noise distribution) in detail.
6. Explain the detail of Spatial Filters.
7. Explain the various smoothing filters in the spatial domain.
8. Explain the various sharpening filters in spatial domain.
9. Explain the basic steps for filtering (Image Enhancement) in frequency domain.
10. Discuss in detail about the significance of homomorphic filtering in Image Enhancement.

UNIT-III IMAGE RESTORATION

2-Marks

1. Define Image Restoration.
2. Compare Image Enhancement with Image Restoration.
3. Show the block diagram of a model of the Image degradation/restoration process.
4. Classify Image Restoration techniques.
5. Define blind deconvolution.
6. Define inverse filtering.
7. Define Pseudo inverse filtering.
8. What is meant by Weiner filter?
9. What is the main objective of Weiner filtering?
10. What is meant by geometric transformation?
11. What are the two basic operations of geometric transformation?
12. What is meant by Spatial transformation?

13. Define Lagrange multipliers.
14. Write the draw backs of inverse filtering.
15. Show that the block diagram of a Weiner model with noise.

13-Marks

1. Explain the image degradation model and its properties.
2. Explain the degradation model for continuous function and for discrete function.
3. Write notes on inverse filtering as applies to Image Restoration.
4. Write short notes on a Wiener filter characteristic.
5. Explain in detail the constrained least squares restoration.
6. Discuss about the Lagrange multipliers.
7. Explain unconstrained restoration and constrained restoration.
8. Discuss about the concepts and uses of Geometric transformation in the context of Image Restoration.
9. Explain in detail the constrained least squares restoration.
10. Describe the principle of Weiner filtering in image restoration.

UNIT-IV IMAGE SEGMENTATION

2-Marks

1. Define image segmentation.
2. What are the different image segmentation techniques?
3. What are the two properties that are followed in image segmentation?
4. Explain the property of discontinuity?
5. What are three types of discontinuity in digital image?
6. What is the idea behind the similarity property?
7. What is edge?
8. What is edge detection? Explain.
9. Define zero crossing property of edge detection.
10. What is meant by gradient operators?
11. Define Laplacian?
12. Define Laplacian of a Gaussian function.
13. Write about linking edge points.
14. How to detect isolated points in an image?
15. What are the types of thresholding?

13-Marks

1. What is segmentation?
2. Explain the various detection of discontinuities in detail.
3. Explain edge linking and boundary detection in detail.

4. Explain thresholding in detail.
5. Write short notes on region growing segmentation.
6. Explain in detail about segmentation by Morphological watersheds.
7. Explain Watershed segmentation Algorithm in detail.
8. Explain Morphological image processing in details
9. Explain edge detection.
10. Explain on the Region based segmentation techniques.

UNIT-V IMAGE COMPRESSION AND RECOGNITION

2-Marks

1. What is image compression?
2. Define data compression.
3. What are two main types of data compression?
4. What is need for compression?
5. Show the block diagram of a general compression system model.
6. Define Relative data redundancy.
7. Define is coding redundancy.
8. Define interpixel redundancy.
9. Define psycho visual redundancy.
10. Define encoder
11. Define source encoder.
12. Define channel encoder.
13. What are the types of decoders?
14. What is meant by Error-free compression?
15. What is use of variable-length coding?

13-Marks

1. Explain compression types.
2. Explain in detail the Huffman coding procedure with an example.
3. Describe arithmetic coding of images with an example.
4. Explain the lossless bit plane coding or shift coding.
5. Explain the Run-length coding.
6. Explain transform coding.
7. Describe on the Wavelet coding of images. Or explain the lossy compression wavelet coding.
8. Write notes on JPEG standard with neat diagram.
9. Explain the video compression standards.
10. Explain the basic of vector Quantization in detail.