QUESTION BANK

CS1002- DIGITAL IMAGE PROCESSING

IV YEAR – VIII SEMESTER

UNIT I DIGITAL IMAGE FUNDAMENTALS AND TRANSFORMS

PART – A

1. Define Image?

2. What is Dynamic Range?

3. Define Brightness?

4. Define Tapered Quantization?

5. What do you meant by Gray level?

6. Define Resolutions?

7. What is meant by pixel?

8. Define Digital image?

9. What are the steps involved in DIP?

10. What is recognition and Interpretation?

11. Specify the elements of DIP system?

12. Explain the categories of digital storage?

13. What are the types of light receptors?

14. Differentiate photopic and scotopic vision?

15. How cones and rods are distributed in retina?

16. .Define subjective brightness and brightness adaptation?

17. Define weber ratio

18. What is meant by machband effect?

19. What is simultaneous contrast?

20. What is meant by illumination and reflectance?

PART- B

1. Describe the elements of visual perception.

2. Write short notes on sampling and quantization.

3. Describe the functions of elements of digital image processing system with a diagram.

4. Explain the basic relationships between pixels?

5. Explain the properties of 2D Fourier Transform.

6. Explain convolution property in 2D fourier transform.

7. Explain Fast Fourier Transform (FFT) in detail.

8. Explain in detail the different separable transforms

9. Explain Hadamard transformation in detail.

10. Discuss the properties and applications of 1)Hadamard transform II) Discrete Cosine Trnsforms

11. Explain Haar and slash transform in detail.

12. Explain K-L transform in detail.

13. Write a detailed note on walsh transform.

UNIT II IMAGE ENHANCEMENT TECHNIQUES

PART- A

1. Specify the objective of image enhancement technique.

2. Explain the 2 categories of image enhancement.

3. What is contrast stretching?

4. What is grey level slicing?

5. Define image subtraction.

6. What is the purpose of image averaging?

7. What is meant by masking?

8. Give the formula for negative and log transformation.

09. What is meant by bit plane slicing?

10. What is meant by laplacian filter?

11.What is meant by histogram equalization?

12.Differentiate linear spatial filter and non-linear spatial filter.

13.Give the mask used for high boost filtering?

14 .Define histogram.

15.Write the steps involved in frequency domain filtering.

16.Give the formula for transform function of a Butterworth low pass filter.

17. What do you mean by Point processing?

18. What is Image Negatives?

19. Define Derivative filter?

20. Explain spatial filtering?

21. What is a Median filter?

22. What is maximum filter and minimum filter?

23. Write the application of sharpening filters?

24. Name the different types of derivative filters?

25. What is the advantages of Median filter?

26. Compare spatial and frequency Domain methods.

27.What are the effects of applying Butterworth low pass filter to the noisy image.

PART- B

1. Explain the types of gray level transformation used for image enhancement.

2. What is histogram? Explain histogram equalization.

3. Discuss the image smoothing filter with its model in the spatial domain.

4. What are image sharpening filters? Explain the various types of it.

5. Explain spatial filtering in image enhancement.

6. Explain image enhancement in the frequency domain.

7. Explain Homomorphic filtering in detail.

UNIT III IMAGE RESTORATION

PART- A

1. What is meant by Image Restoration?

2. What are the two properties in Linear Operator?

3. Explain additivity property in Linear Operator?

4. How a degradation process is modeled?

5. Explain homogenity property in Linear Operator?

6. Give the relation for degradation model for continuous function?

7. What is fredholm integral of first kind?

8. Define circulant matrix?

9. what is concept algebraic approach?

10. What are the two methods of algebraic approach?

11. Define Gray-level interpolation?

12. What is meant by Noise probability density function?

13. Why the restoration is called as unconstrained restoration?

14. Which is the most frequent method to overcome the difficulty to formulate the spatial relocation of pixels?

15. What are the three methods of estimating the degradation function?

16. What are the types of noise models?

18. Give the relation for rayleigh noise?

19. Give the relation for Gamma noise?

20. Give the relation for Exponential noise?

21. Give the relation for Uniform noise?

22. Write the properties of Singular value Decomposition (SVD)?

23. What is inverse filtering?

24. What is pseudo inverse filter?

25. What is meant by least mean square filter?

26.Draw the model of image degradation process.

PART- B

1.What is the use of wiener filter in image restoration. Explain.

3.What is meant by Inverse filtering? Explain.

4.Explain singular value decomposition and specify its properties.

5.Explain image degradation model /restoration process in detail.

6. What are the two approaches for blind image restoration? Explain in detail.

7. Discuss about Constrained Least square restoration for a digital image in detail.

8. What is image restoration?Explain the degaradation model for continuous function in detail.

UNIT IV IMAGE COMPRESSION

PART-A

1. What is image compression?

2. What is Data Compression?.

3. What are two main types of Data compression?

5. What are different Compression Methods?

6. Define is coding redundancy?

7. Define interpixel redundancy?

8. What is run length coding?

9. Define compression ratio.

11. Define encoder

12. Define source encoder

13. Define channel encoder

14. What are the types of decoder?

15. What are the operations performed by error free compression?

17. Define Huffman coding

19. Define instantaneous code

20. Define uniquely decodable code

21. Define B2 code

22. Define the procedure for Huffman shift

23. Define arithmetic coding

24. What is bit plane Decomposition?

25. What are three categories of constant area coding?

26.How sub image size selection affect transform coding error.

PART -B

1.What is data redundancy? Explain three basic data redundancy?

2. What is image compression? Explain any four variable length coding compression schemes.

3.Definition of image compression

4. Explain about Image compression model?

5. The source Encoder and Decoder

6.The channel Encoder and Decoder

7. Explain about Error free Compression?

8. Explain about Lossy compression?

9. Explain the schematics of image compression standard JPEG.

10. Diffeentiate between lossless and lossy compression and explain transform coding system with a neat diagram.

UNIT V IMAGE SEGMENTATION AND REPRESENTATION

PART-A

1. What is segmentation?

2. Write the applications of segmentation

3. What are the three types of discontinuity in digital image?

4.How the derivatives are obtained in edge detection during formulation?

5 Write about linking edge points.

6.What are the two properties used for establishing similarity of edge p What is edge?

8. Give the properties of the second derivative around an edge?

9. Define Gradient Operator?

10. What is meant by object point and background point?

11. What is global, Local and dynamic or adaptive threshold?

12. Define region growing?

13. Specify the steps involved in splitting and m15. What are the 2 principles steps in marker selection?

14. Define shape numbers

15. Describe Fourier descriptors

16 Define chain codes?

17. What are the demerits of chain code?

18. What is thinning or skeletonizing algorithm?

19. Specify the various image representation approaches

20. What is polygonal approximation method ?

21. Specify the various polygonal approximation methods

22. Name few boundary descriptors

23.Give the Fourier descriptors for the following transformations

24. Define length of a boundary.

25. Define eccentricity and curvature of boundary

PART-B

1. Discuss about region based image segmentation techniques. Compare threshold region based techniques.

2. Define and explain the various representation approaches?

3.Polygon approximations

4. Explain Boundary descriptors in detail with a neat diagram..

5. Explain regional descriptors

6. Explain the two techniques of region representation

7. Explain the segmentation techniques that are based on finding the regions directly

8. How is line detected? Explain through the operators