MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC, NBA & Affiliated to Anna University)

Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

Department of Electronics and Communication Engineering

Question Bank - Academic Year (2021-22)

Course Code & Course Name : 19ECC17 / DIGITAL IMAGE PROCESSING

Name of the Faculty : Mr.V.Ramesh, Dr,T.R.GaneshBabu, Dr.C.Selvi

Year/Sem/Sec : III/VI/A,B & C

Unit I digital Image Fundamentals

Part-A (2 Marks)

1. Define Image?
2. Define Brightness?
3. What do you meant by Color model?
4. List the hardware oriented color models?
5. What is Hue of saturation?
6. List the applications of color models?
7. Define Resolutions?
8. What is meant by pixel?
9. Define Digital image?
10. What are the steps involved in DIP?
11. What is recognition and Interpretation?
12. Specify the elements of DIP system?
13. Define sampling and quantization.

Part B (16 Marks)

1. What are the fundamental steps in Digital Image Processing?
2. What are the components of an Image Processing System?
3. Explain about elements of visual perception.
4. Explain the process of image acquisition.
5. Explain about image sampling and quantization process.
6. Explain about the Color Model?

Unit-II Image Enhancement

Part-A (2 Marks)

1. Specify the objective of image enhancement technique.
2. Name the different types of derivative filters?
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.
9. What is meant by bit plane slicing?
10. Define histogram.

Part B (16 Marks)

1) Discuss in detail about Histogram Processing in detail.
2) Discuss in detail about Gray level transformations.
3) What is meant by Spatial Filtering? Discuss in detail about Smoothing and Sharpening Spatial Filtering?
4) What is meant by Frequency Filtering? Discuss in detail about Smoothing and Sharpening frequency Filtering?

Unit III Image Restoration and Segmentation

Part-A (2 Marks)

1. What do you mean by Restoration, Degradation and Distortion?
2. What is meant by Image Restoration?
3. Explain additivity property in Linear Operator?
4. What are the two methods of algebraic approach?
5. What is meant by Noise probability density function?
6. Why the restoration is called as unconstrained restoration?
7. What are the types of noise models?
8. What is meant by least mean square filter or wiener filter?
9. What is pseudo inverse filter?
10. Compare constrained and unconstrained restoration.
11. What is edge?
12. How edges are linked through hough transform?
13. State the problems in region splitting and merging based image segmentation.

Part B (16 Marks)

1. Write about Noise Probability Density Functions.
2. Write a short note on Inverse filtering and Wiener filter in detail.
3. Explain the use of wiener filtering in image restoration.
4. Explain the Adaptive Filters.
5. Discuss in detail about Edge Linking and Boundary Detection.
6. Explain about Region based segmentation.
7. Discuss about Morphological Processing.

Unit IV Wavelets and Image Compression

Part-A (2 Marks)

1. What is image, Data Compression and its type?
2. What is the need for Compression?
3. Define is coding redundancy and inter pixel redundancy? coding redundancy
4. What is run length coding?
5. Define compression ratio
6. Define encoder and source encoder?
7. Define channel encoder and types of decoder?
8. What are the operations performed by error free compression and Variable Length Coding?

9. Define Huffman coding and mention its limitation
10. Define Block code, instantaneous code and B2 code?
11. Define the procedure for Huffman shift coding
12. What is bit plane Decomposition?
12. What are the coding systems in JPEG?
13. What is JPEG and basic steps in JPEG?
14. What is shift code?

Part B (16 Marks)

1. What is image compression? Explain any four variable length coding compression schemes.
2. Define Compression and Explain the general compression system model?
3. Explain in full details about Error free Compression?
4. Explain in full details about Lossless Predictive Coding?
5. Explain in full details about Lossy Compression and Lossy Predictive Coding?
6. Explain in full details about Compression Standards?

Unit V Image Representation and Recognition

Part-A (2 Marks)

1. Define chain codes?
2. What are the demerits of chain code?
3. What is thinning or skeletonising algorithm?
4. What is polygonal approximation method?
5. Define Signature?
6. Describe Fourier descriptors?
7. Define Texture and list the approaches to describe texture of a region.
8. What are the features of Fourier spectrum?
9. Define Pattern recognition?
10. Specify the various Polygonal approximation methods.
11. Define shape numbers.
12. Name a few measures used as simple descriptors in regional descriptors.

Part B (16 Marks)

1. Define Boundary representation with an algorithm and also briefly explain about the Chain codes
2. Explain in detail about the Polygonal approximation and some of its techniques.
3. Explain in detail about Signature and also explain Boundary segments.
4. Explain the following terms:
   (i)Fourier descriptors
   (ii) Statistical moments
5. Explain in detail about the Patterns and pattern classes.
6. Define matching. How the matching is performed based on recognition.

Course Faculty **HoD**

1. Mr.V.Ramesh, AP/ECE
2. Dr.T.R.GaneshBabu, Prof/ECE
3. Dr.C.Selvi, ASP/ECE