Digital Image Processing
Unit III, IV and V

Question Bank:

PART-A (10*1 = 10Marks)

MCQ:

1-4 : from Unit-3

5-7: from Unit -4

8-10: from Unit -5

PART-B (3*8 = 24 Marks)

11. Write short notes on:
    i) Salt-and-pepper noise
    ii) Gaussian noise

11. i) Explain their differences between Gaussian noise and Salt & pepper noise in terms of their characteristics and sources.
ii) Explain how inverse filtering is used to restore a degraded image. What assumptions does it rely on?

12. Describe the steps involved in Wiener filtering. Why is it called an optimum filter?

12. Given a 3x3 gray scale image block and a left-neighbour predictor, compute the predicted values, prediction error, and reconstructed image

13. Write about how histogram-based features can be used for image classification.

13. Given a 2D dataset, apply PCA to compute the first principal component and project the data on it. Show the steps including mean normalization and covariance calculation.

14. How does Linear Discriminant Analysis (LDA) differ from PCA in its approach to feature selection?

14. What does Local Binary Pattern (LBP) represent in an image? Explain its basic operation.

PART-C (2*16=32 Marks)

15. i) Describe Local Binary Patterns (LBP) in details, include the algorithm, its advantages.
ii) How it can be used in real-time applications like face recognition and texture classification.

15. Explain the working principles of lossy and lossless image compression techniques with suitable diagrams and examples. Analyze the differences in their performances, typical use cases, and suitability for various applications such as medical imaging, web usage, and archival storage.

16. i) Discuss Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA) in the context of image recognition.
ii) Compare their objectives, techniques, and use cases.

16. Illustrate with an example how CNN is better suited for image processing than ANN.

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