Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

MCADD-804 (3)

M.C.A. (Integrated), VIII Semester

Examination, May 2024

Digital Image Processing

(Elective - III)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Explain the concept of visual perception in the context of digital images. How does it influence the design and interpretation of images?
   b) Explain the role of image preprocessing in digital image acquisition. What are some common preprocessing techniques used to enhance the quality of acquired images?

2. a) Define spatial filtering in the context of digital image processing. How does spatial filtering differ from frequency domain filtering?
   b) Explain the model of image degradation/restoration processes in digital image processing. What are the key components of this model and how do they contribute to the degradation and restoration of images?

3. a) Discuss the concept of inverse filtering in image restoration. What are the limitations of inverse filtering and how can they be addressed?
   b) Describe the characteristics of directional filters used for edge enhancement. How do directional filters detect edges oriented in specific directions explain with suitable example?

4. a) How does color information enhance the interpretation and analysis of digital images? Discuss.
   b) Discuss the basics of full-color image processing. What are the primary challenges in processing and manipulating full-color images?

5. a) Explain the concepts of smoothing and sharpening in color image processing
   b) Describe the characteristics of low-pass filters in image enhancement. How do low-pass filters attenuate high-frequency components in the frequency domain?

6. a) Discuss the principles behind homomorphic filters in the frequency domain. How it enhance the frequency components to improve contrast and visibility?
   b) What computational benefits do frequency domain filters offer as compared to the spatial domain?

7. a) Explain the concept of point detection in image segmentation. How do point detection algorithms identify individual points or key points in an image?
   b) Discuss grayscale morphology and its significance in digital image processing.

8 Write a short note on any two :
   a) Image sampling and quantization
   b) Sharpening Filters
   c) Histogram Processing
   d) Region based segmentation

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