

1. Which of the following is NOT an example of a field that extensively uses Digital Image Processing (DIP)?

- a) Medical Imaging
- b) Weather Forecasting
- c) Satellite Imaging
- d) Security and Surveillance

Answer: b) Weather Forecasting

Explanation: While weather forecasting relies on data from various sources including satellites, it typically does not heavily involve digital image processing. Instead, it primarily relies on meteorological models and data analysis techniques.

2. What are the fundamental steps involved in Digital Image Processing (DIP)?

- a) Acquisition, Preprocessing, Enhancement, Compression
- b) Sampling, Quantization, Compression, Analysis
- c) Segmentation, Feature Extraction, Recognition, Interpretation
- d) Filtering, Transformation, Segmentation, Visualization

Answer: a) Acquisition, Preprocessing, Enhancement, Compression

Explanation: The fundamental steps in DIP typically involve acquiring the image, preprocessing it to remove noise or artifacts, enhancing it to improve visibility or extract features, and then compressing it for efficient storage or transmission.

3. Which component is NOT part of an image processing system?

- a) Input Device
- b) Processor
- c) Output Device

d) Networking Device

Answer: d) Networking Device

Explanation: While networking may be involved in transmitting or receiving images in some systems, it is not a direct component of the image processing system itself, which primarily consists of input devices (such as cameras), processors, and output devices (such as monitors or printers).

4. What are the basic elements of visual perception relevant to Digital Image Processing?

- a) Pixels, Histograms, Transformations
- b) Brightness, Contrast, Color Perception
- c) Sampling Rate, Resolution, Bit Depth
- d) Fourier Transform, Convolution, Morphological Operations

Answer: b) Brightness, Contrast, Color Perception

Explanation: Visual perception elements like brightness, contrast, and color perception are crucial in understanding how humans perceive images and are thus fundamental to digital image processing tasks such as enhancement and manipulation.

5. In image sampling, what does the term “sampling rate” refer to?

- a) Number of bits per pixel
- b) Rate at which the image is acquired by the sensor
- c) Number of pixels per unit area
- d) Rate at which the continuous image is converted into a discrete signal

Answer: d) Rate at which the continuous image is converted into a discrete signal

Explanation: The sampling rate in image sampling refers to the frequency at which samples

(pixels) are taken from the continuous image to convert it into a discrete digital signal.

6. Which process involves assigning discrete values to continuous image data?

- a) Sampling
- b) Quantization
- c) Compression
- d) Enhancement

Answer: b) Quantization

Explanation: Quantization is the process of converting continuous image data into discrete values, typically represented as digital numbers, which is essential for digital image representation and processing.

7. What is the primary purpose of image compression in digital image processing?

- a) To reduce the visual quality of the image
- b) To increase the file size for better resolution
- c) To reduce storage space and transmission bandwidth
- d) To introduce noise for security purposes

Answer: c) To reduce storage space and transmission bandwidth

Explanation: Image compression aims to reduce the amount of data required to represent an image efficiently, enabling it to be stored or transmitted using less space or bandwidth while preserving essential visual information.

8. Which technique involves dividing an image into meaningful regions or objects?

- a) Filtering
- b) Segmentation

- c) Transformation
- d) Morphological Operations

Answer: b) Segmentation

Explanation: Segmentation is the process of partitioning an image into distinct regions or objects based on certain characteristics such as intensity, color, or texture, which is crucial for higher-level image analysis tasks.

9. What is the basic unit of a digital image?

- a) Histogram
- b) Vector
- c) Pixel
- d) Matrix

Answer: c) Pixel

Explanation: A pixel (short for picture element) is the smallest unit of a digital image, representing a single point in the image's grid and containing information about its color and intensity.

10. Which of the following is NOT a common image processing transform?

- a) Fourier Transform
- b) Laplace Transform
- c) Wavelet Transform
- d) Convolution Transform

Answer: d) Convolution Transform

Explanation: While convolution is a common operation in image processing used for tasks like

filtering, it is not considered a transform like the Fourier, Laplace, or Wavelet transforms, which involve converting images into different domains for analysis or manipulation.