SNS COLLEGE OF ENGINEERING

AN AUTONOMOUS INSTITUTION

Accredited by NAAC – UGC with 'A' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

UNIT – I

DIGITAL IMAGE FUNDAMENTALS AND TRANSFORMS

1. **Which of the following is the first fundamental step in digital image processing?**
   a) Image enhancement
   b) Image acquisition
   c) Image restoration
   d) Image compression
   Answer: b) Image acquisition
2. **Which component is responsible for converting an analog image into a digital form?**
   a) Image sensor
   b) Quantizer
   c) Sampler
   d) Display device
   Answer: a) Image sensor
3. **What is the main function of the human eye's retina?**
   a) Capturing light
   b) Focusing light
   c) Image processing
   d) Transmitting signals to the brain
   Answer: d) Transmitting signals to the brain
4. **Brightness adaptation in the human eye allows for:**
   a) Adjusting to different light levels
   b) Detecting colors
   c) Recognizing patterns
   d) Enhancing image contrast
   Answer: a) Adjusting to different light levels
5. **The process of converting continuous tone images to digital form is called:**
   a) Sampling
   b) Quantization
   c) Filtering
   d) Transformation
   Answer: a) Sampling

6. **Which of the following is not a distance measure in image processing?**
   a) Euclidean distance
   b) Manhattan distance
   c) Chebyshev distance
   d) Fourier distance
   Answer: d) Fourier distance
7. **In image processing, a pixel's "4-neighbors" refers to:**
   a) The diagonal neighbors
   b) The horizontal and vertical neighbors
   c) All adjacent pixels
   d) None of the above
   Answer: b) The horizontal and vertical neighbors
8. **Which transform is widely used for image compression due to its energy compaction property?**
   a) Discrete Cosine Transform (DCT)
   b) Fourier Transform
   c) SVD Transform
   d) Wavelet Transform
   Answer: a) Discrete Cosine Transform (DCT)
9. **Which of the following properties is associated with the 2D Discrete Fourier Transform (DFT)?**
   a) Linearity
   b) Shift Invariance
   c) Convolution
   d) All of the above
   Answer: d) All of the above
10. **Which image transform is particularly suitable for multi-resolution analysis?**
    a) Fourier Transform
    b) Discrete Cosine Transform
    c) Wavelet Transform
    d) Singular Value Decomposition
    Answer: c) Wavelet Transform
11. **The process of determining the boundaries of objects in an image is known as:**
    a) Quantization
    b) Edge detection
    c) Sampling
    d) Histogram equalization
    Answer: b) Edge detection
12. **In an image processing system, the component responsible for enhancing image contrast is:**
    a) Image sensor
    b) Display device
    c) Processor
    d) Algorithm
    Answer: d) Algorithm

13. **What does SVD stand for in the context of image processing?**
    a) Sampled Vector Decomposition
    b) Singular Value Decomposition
    c) Simple Value Decomposition
    d) Signal Vector Decomposition
    Answer: b) Singular Value Decomposition
14. **Which of the following is not considered a basic concept in sampling?**
    a) Aliasing
    b) Subsampling
    c) Quantization
    d) Edge detection
    Answer: d) Edge detection
15. **In digital image processing, "connectivity" is used to:**
    a) Define regions of interest
    b) Enhance image brightness
    c) Perform image sampling
    d) Transform the image
    Answer: a) Define regions of interest
16. **Which distance measure is also known as the city block distance?**
    a) Euclidean distance
    b) Manhattan distance
    c) Chebyshev distance
    d) Minkowski distance
    Answer: b) Manhattan distance
17. **The 2D DFT of an image results in:**
    a) A frequency domain representation
    b) A spatial domain representation
    c) A time domain representation
    d) An edge map
    Answer: a) A frequency domain representation
18. **Which transform is used in JPEG image compression?**
    a) Fourier Transform
    b) Discrete Cosine Transform
    c) Wavelet Transform
    d) Laplace Transform
    Answer: b) Discrete Cosine Transform
19. **The process of mapping input intensity values to output intensity values to improve contrast is called:**
    a) Quantization
    b) Histogram equalization
    c) Sampling
    d) Image compression
    Answer: b) Histogram equalization
20. **Which component of the human eye is responsible for detecting color?**
    a) Rods
    b) Cones

c) Retina
d) Optic nerve
Answer: b) Cones

Fill-in-the-Blanks

21. **The process of converting continuous signals into discrete signals is called _____.**
    Answer: Sampling
22. **In digital image processing, the smallest unit of a digital image is known as a _____.**
    Answer: Pixel
23. **_____ is the distance measure that considers both the horizontal and vertical neighbors of a pixel.**
    Answer: Manhattan distance
24. **The transformation that is used to convert a signal from the spatial domain to the frequency domain is known as _____.**
    Answer: Fourier Transform
25. **In image processing, _____ is the process of reducing the number of bits needed to represent an image.**
    Answer: Quantization