

27. a. What is intensity transformation function? What are the various types of intensity transformation? Discuss about each intensity transformation. 3+7 2 2 2

(OR)

b. What is histogram processing? Discuss the various method of histogram processing. 10 2 2 2

28. a. Describe the following noise probability density function with its equation and neat graph 2 3 2

- (i) Gaussian noise 2
- (ii) Rayleigh noise 2
- (iii) Gamma noise 2
- (iv) Uniform noise 2
- (v) Salt and pepper noise 2

(OR)

b. Discuss the ARR hildreth and canny edge detector with equation and graph. 10 2 3 2

29. a. Describe the image compression. Explain the Huffman coding, LZW coding, run length coding. 10 2 4 2

(OR)

b. Discuss the following techniques 2 4 2

- (i) Block transform coding 4
- (ii) Wavelet coding 3
- (iii) JPEG standard 3

30. a. Write short notes on 2 5 2

- (i) Chain code 5
- (ii) Fourier descriptor 5

(OR)

b. Write short notes on 2 5 2

- (i) Polygonal approximation 3
- (ii) Signature 3
- (iii) Boundary segments 4

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Reg. No.

B.Tech. DEGREE EXAMINATION, NOVEMBER 2022
Sixth/ Seventh Semester

18CSE353T – DIGITAL IMAGE PROCESSING

(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

Note:

- (i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
- (ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours

Max. Marks: 75

PART – A (25 × 1 = 25 Marks)

Answer **ALL** Questions

- | | Marks | BL | CO | PO |
|--|-------|----|----|----|
| 1. Which of the following is the first application of image processing?
(A) Newspaper industry (B) Telecom industry
(C) Digital printing (D) Health care | 1 | 1 | 1 | 1 |
| 2. What are the frequency range of ultrasound transmission?
(A) 2 to 3 MHz (B) 4 to 6MHz
(C) 7 to 10 MHz (D) 1 to 5 MHz | 1 | 2 | 1 | 1 |
| 3. How many membranes are present in the eye?
(A) 3 (B) 4
(C) 2 (D) 1 | 1 | 2 | 1 | 1 |
| 4. Which one of the following is called photopic?
(A) Macula (B) Iris vision
(C) Cone vision (D) Scotopic | 1 | 1 | 1 | 1 |
| 5. _____ is the process of using known data to estimate values at unknown locations?
(A) Estimation (B) Interpolation
(C) Reduction (D) Isopreference | 1 | 1 | 1 | 1 |
| 6. Which of the following technique is used for reversing the intensity levels of an image
(A) Negative transformation (B) Inverse transformation
(C) Bit slicing (D) Contrast stretching | 1 | 1 | 2 | 1 |
| 7. What is the pros of contrast stretching?
(A) Expands the range of intensity (B) Correct the power law response levels
(C) Highlight the specific range of (D) Inverse the intensity value intensity | 1 | 1 | 2 | 1 |

8. Inverse of the transformation is indicated as _____.
 (A) $\gamma_k = T^{-1}(s_k)$ (B) $\gamma_k = (Ts_k)^{-1}$
 (C) $\gamma_k = \frac{T}{s_k}$ (D) $\gamma_k = T(s_k^{-1})$
9. Which of the below one is not suited for the spatial filtering process
 (A) Passing the frequency component (B) Enhancing the frequency component
 (C) Modifying the frequency component (D) Rejecting the specified frequency component
10. Mask, template, and window are used to indicate
 (A) Band pass filter (B) Low pass filter
 (C) Random noise filter (D) Spatial filter kernel
11. When the Fourier spectrum of noise is constant, the noise is called _____.
 (A) White noise (B) Random error
 (C) Salt noise (D) Pepper noise
12. _____ achieves smoothing comparable to an arithmetic mean filter
 (A) Harmonic mean filter (B) Geometric mean filter
 (C) Median filter (D) Max filter
13. Which filter is well suited for salt noise
 (A) Median filter (B) Mean filter
 (C) Harmonic mean filter (D) Geometric mean filter
14. Which of the below meaning is appropriate for the order statistic filter.
 (A) The beat known order statistic filter in image processing is the median filter
 (B) Smoothing is high in order statistic filter
 (C) Intensity of the image if narrow in the filter (D) It is most suited in all the application
15. Which is the simplest approach to restoration?
 (A) Image transformation (B) Direct inverse filtering
 (C) Image negativity filtering (D) Adaptive filter
16. Which technique is used to divide an image into small overlapping blocks of equal size
 (A) Noise removal (B) Smoothing
 (C) Compression (D) Segmentation
17. Which of the below one is not a one of the process of decoder in block transform coding?
 (A) Sub image decomposition (B) Encoding
 (C) Transformation (D) Quantization

18. Each piece of information is assigned a sequence of code symbols, called a _____.
 (A) Sampling (B) Blocks of code
 (C) Enhancing the symbols (D) Code word
19. Arithmetic coding is used to generate _____.
 (A) Variable length codes (B) Non block codes
 (C) Fixed length codes (D) Sum of all the codes
20. The process of reducing the amount of data required to represent a given quantity of information is known as _____.
 (A) Decomposition (B) Transformation
 (C) Compression (D) Coding
21. _____ are used to represent a boundary by a connected sequence of straight line.
 (A) Huffman (B) Run length encoding
 (C) Wavelet coding (D) Chain code
22. What is the basic idea of signatures?
 (A) It is used in the compression technique (B) Used to arrange the straight line segments of specified length
 (C) Used to thinning the region (D) Reduce the boundary representation to a 1-D function
23. _____ is the study of properties of a figure that are unaffected by any deformation, provided that there is no tearing or joining of figure.
 (A) Shape number (B) Polygonal approximation
 (C) Topological descriptors (D) Boundary segments
24. Which of the below one is most suited for quantifying the texture?
 (A) Measures the contrast of the image (B) Measures the relative positions of pixels in an image
 (C) Find the shape of the image (D) Measures deformation in an image.
25. Which of the below one is not a texture measure based on histograms?
 (A) Correlation (B) Average entropy
 (C) Uniformity (D) Heterogeneity

PART – B (5 × 10 = 50 Marks)

Answer ALL Questions

26. a. Which components are involved in image processing techniques? Explain in with a neat diagram.
- (OR)
- b. Diagrammatically explain the elements of visual perception.