30. a.	Illustrate and explain in detail about image segmentation.	12	4	3	4
	(OR)				
b.i.	Describe the edge linking and boundary detection methods.	6	4	3	4
ii.	Explain the region splitting and region merging.	6	4	3	4
31. a.	Explain about image registration and its different types with an application.	12	4	5	4
	(OR)				
b.	Explain in detail about histogram processing.	12	4	5	4
32. a.	Explain morphological filters and its different types with an example.	12	4	6	4
	(OR)				
b.	Write detailed note on sharpening spatial filters.	12	4	6	4

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Reg. No.														

B.Tech. DEGREE EXAMINATION, JUNE 2023

Sixth Semester

18CSE469J – IMAGE PROCESSING AND PATTERN RECOGNITION

(For the candidates admitted during the academic year 2018-2019 to 2021-2022)

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 & Part - C** should be answered in answer booklet.

Time: 3 hours Max. Marks: 100

	Marks	BL	CO	PO

PART – A (20 × 1 = 20 Marks)

Answer **ALL** Questions

1. The corena is the tough transparent tissue that cover's eyes — 1 1 1 2
   (A) Eyelid (B) Exterior
   (C) Anterior (D) Lashes

2. What is digital image processing? — 1 1 1 2
   (A) It's an application that alters digital videos (B) It's a software that allows altering digital pictures
   (C) It's a system that manipulates digital media (D) It's a machine that allows altering digital images

3. In an M × N image matrix, M is the number of _____. — 1 1 1 2
   (A) Intensity levels (B) Colors
   (C) Rows (D) Columns

4. What are the categories of Digital Image Processing? — 1 1 2 2
   (A) Image enhancement (B) Image classification and analysis
   (C) Image transformation (D) Image segmentation

5. What is each element of the image matrix is called _____. — 1 1 1 2
   (A) Dots (B) Pixels
   (C) Coordinates (D) Value

6. The picture formation in the eye vary from image formation in a camera. — 1 2 2 4
   (A) Fixed focal length (B) Varying distance between lens and imaging plane
   (C) No difference (D) Variable focal length

7. Imaging system produces — 1 1 2 2
   (A) High resolution image (B) Voltage signal
   (C) Digitized image (D) Analog signal

8. Relate the following statement to describe the term pixel depth. — 1 1 2 2
   (A) Number of units used to represent each pixel in RGB space
   (B) Number of mm used to represent each pixel in RGB space
   (C) Number of bytes used to represent each pixel in RGB space
   (D) Number of bits used to represent each pixel in RGB space

9. To infer the display, we need an image in a — 1 2 2 4
   (A) Spatial domain (B) Frequency domain
   (C) Algebraic domain (D) Spatial and frequency domain

10. Which of the following is the first and foremost step in image processing? — 1 1 2 2
   (A) Image acquisition (B) Segmentation
   (C) Image enchantment (D) Image restoration

11. Which of the following is used to resolve the dark features in the image? — 1 1 2 2
   (A) Gaussian transform (B) Laplacian transform
   (C) Power-law transformation (D) Histogram specification

12. Which of the following is the next step in image processing after compression? — 1 1 2 2
   (A) Representation and description (B) Morphological processing
   (C) Segmentation (D) Wavelets

13. In _____ image we notice that the components of histogram are concentrated on the low side on intensity scale. — 1 2 2 4
   (A) Bright (B) Dark
   (C) Colorful (D) Binary

14. _____ determines the quality of a digital image. — 1 1 4 4
   (A) The discrete gray levels (B) The number of examples
   (C) Discrete gray levels and number of samples (D) None of the mentioned

15. Highlighting the contribution made to total image by specific bits instead of highlighting intensity level changes is called _____. — 1 1 2 2
   (A) Intensity highlighting (B) Byte-slicing
   (C) Bit-plane slicing (D) Piecewise linear transformation

16. Which of the following is the abbreviation of JPEG? — 1 1 2 2
   (A) Joint photographic experts group (B) Joint photography expanded group
   (C) Joint photographic expanded group (D) Joint photographs expanded group

17. Which of the following is the disadvantage of a smoothing filter? — 1 2 2 4
   (A) Bluer innex pixels (B) Blur edges
   (C) Sharp edges (D) Remove sharp transitions

18. Which of the following is not a process of image processing? — 1 1 2 2
   (A) High level (B) Low level
   (C) Last level (D) Mid level

19. _____ involves reversing the intensity levels on an image. — 1 1 3 2
   (A) Log transformation (B) Piecewise linear transformation
   (C) Image negatives (D) Bit-plane slicing

20. Infer digitizing the coordinate values of continuous image — 1 2 5 4
   (A) Sampling (B) Quantization
   (C) Compression (D) Segmentation

PART – B (5 × 4 = 20 Marks) — Marks BL CO PO
Answer **ANY FIVE** Questions

21. Define spatial and gray level resolution of an image. — 4 1 1 2

22. Let m and n be the pixels with coordinates (5, 5) and (10, 5) respectively. Find out which distance measure gives the minimum distance between pixels. — 4 3 1 2

23. Explain the significance of opening and closing in morphological operations. — 4 2 1 4

24. What is meant by multilevel thresholding? — 4 1 2 2

25. Name the different types of redundancies present in an image. — 4 2 2 4

26. Differentiate clustering and classification. — 4 2 6 4

27. What is meant by pattern? — 4 1 1 2

PART – C (5 × 12 = 60 Marks) — Marks BL CO PO
Answer **ALL** Questions

28. a. Illustrate any five filters uses neighbourhoods metrics and explain in detail with an application. — 12 4 1 2

(OR)

b.i. Summarize the various neighbourhood operations in images. — 6 4 1 2

ii. Interpret the mathematical principles of — 6 4 1 2
- 8 – adjacency
- M – adjacency
- Path for the following matrix with V = {1, 2}

0 1 1
0 2 0
0 0 1

29. a. Illustrate about image sharpening filters. Explain its various types in detail. — 12 4 2 4

(OR)

b. What is meant by spatial filtering? Explain the significance of sharpening and smoothing filters for image enhancement. — 12 4 2 4