15. (a) Discuss the importance of morphological operations.

Or

(b) Compare erosion and dilation with example.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the fundamental steps in image processing.

Or

(b) Analyze the basic mathematical tools used in Digital image Processing.

17. (a) Explain discrete Fourier transform in detail.

Or

(b) Discuss about histogram processing.

18. (a) Classify the various types of noise model.

Or

(b) Discuss the walsh transform with suitable equations.

19. (a) Elaborate note on noise in color images.

Or

(b) Illustrate the image compression model in detail.

20. (a) Describe the various thresholding based image segmentation.

Or

(b) Explain region splitting and merging in segmentation.

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Reg. No. : .....

Code No. : 7472 **Sub. Code : ZCSM 31**

M.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2023

Third Semester

Computer Science – Core

DIGITAL IMAGE PROCESSING

(For those who joined in July 2021-2022 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. What is pixel?
   (a) Pixel is the elements of a digital image
   (b) Pixel is the elements of an analog image
   (c) Pixel is the cluster of a digital image
   (d) Pixel is the cluster of an analog image
2. An image is considered to be a function of $a(x, y)$, where a represents:
   (a) Height of image
   (b) Width of image
   (c) Amplitude of image
   (d) Resolution of image

3. Smoothing filters are mostly used in

(a) Blurring (b) Noise reduction

(c) Contrast (d) Both (a) and (b)

4. A filter that passes low frequencies is

(a) Band pass filler (b) High pass filter

(c) Low pass filter (d) None of the Mentioned

5. The walsh and hadamard transforms are _____ in nature

(a) Sinusoidal (b) Cosine

(c) Non-sinusoidal (d) Cosine and sine

6. Image restoration is used to improve the _____Image

(a) Quantity (b) Quality

(c) Blur (d) None of the above

7. Compressed image can be recover back by

(a) Image contrast

(b) Image enhancement

(c) Image equalization

(d) Image decomposition

8. Which of the following are not in a compressed format?

(a) MP3 (b) Bitmap

(c) MPEG (d) JPEG

9. Edge detector method is used to detect

(a) Area (b) Line

(c) Point (d) Edge

10. Threshold based segmentation is based on

(a) Number of clusters

(b) Clip level

(c) Number of regions

(d) All of the above

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) List and explain the elements of visual perception.

Or

(b) Explain about relationship between the pixels.

12. (a) Specify the properties of 2D Fourier transform.

Or

(b) Differentiate between linear spatial filter and nonlinear spatial filter.

13. (a) Draw and explain the image degradation model.

Or

(b) Write a note on Geometric mean filter.

14. (a) Explain about color Image fundamentals.

Or

(b) Discuss about run length coding.