Reg. No. :

Code No.: 6101 Sub. Code : PCSM 31

M.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2021

Third Semester

COMPUTER SCIENCE - CORE

DIGITAL IMAGE PROCESSING

(For those who joined in July 2017 onwards)

Time : Three hours Maximum : 75 marks

PART A — $(10 \times 1 = 10 \text{ marks})$

Answer ALL questions.

Choose the correct answers :

- 1. The size of the image is extended by mirror reflecting it across its border with the ______ method.
 - (a) replicate (b) circular
 - (c) symmetric (d) gmean

(6 Pages)

- 2. Function ——— is the basic image processing toolbox function for intensity transformation of gray-scale images.
 - (a) imadjust (b) strechlim
 - (c) intrans (d) none of the above
- 3. When an offset is combined with multiplying the filter by a constant greater than 1, the approach is called
 - (a) High pass sharpening
 - (b) High-frequency emphasis filtering
 - (c) Low pass smoothing
 - (d) Surface plotting

4. Expand PSF

- (a) Point Spread Function
- (b) Point Split Function
- (c) Point Segment Function
- (d) None of the above
- 5. Images can be blurred using
 - (a) Contouring (b) Low pass filter
 - (c) Erosion (d) High pass filter
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- 6. A class of transformations that differ in the transformation kernels employed, the fundamental nature of those functions and in the way they are applied are known as ______
 - (a) Discrete wavelet transform
 - (b) Scalability
 - (c) Translatability
 - (d) Compression
- 7. Reduction of binary objects or shapes in an image to strokes whose width is one pixel is called
 - (a) Thinning
 - (b) Pruning
 - (c) Motion compensation
 - (d) Skeletonization
- 8. _____ is an operation which grow or thickens objects in an image.
 - (a) Erosion (b) Compression
 - (c) Dilation (d) Mapping
- 9. A scalar, the maximum distance between any two pixels in the boundary of a region is
 - (a) Major Axis (b) Minor Axis
 - (c) Basic rectangle (d) Diameter

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- 10. Both internal and external markers are used to modify the gradient image using a procedure called
 - (a) signatures
 - (b) minima imposition
 - (c) watershed transform
 - (d) zero crossings detectors

PART B — $(5 \times 5 = 25 \text{ marks})$

- Answer ALL questions, choosing either (a) or (b). Each answer should not exceed 250 words.
- 11. (a) Explain how digital image is represented.

Or

- (b) List the spatial filters support functions in image processing toolbox standard spatial filters.
- 12. (a) Write a note on 2-D discrete Fourier transform.

\mathbf{Or}

- (b) Explain direct inverse filtering.
- 13. (a) Discuss about indexed images in MATLAB.

 \mathbf{Or}

(b) Give a brief account on Basics of color image processing.

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[P.T.O]

14. (a) Explain dialation and erosion.

Or

- (b) Write down the five basic steps in Huffman decoding process.
- 15. (a) Write a note on point detection in image segmentation.

Or

(b) Explain simple boundary descriptors.

PART C — $(5 \times 8 = 40 \text{ marks})$

- Answer ALL questions, choosing either (a) or (b). Each answer should not exceed 600 words.
- 16. (a) Explain the usage of imadjust and strechlim in intensity transformation.

 \mathbf{Or}

- (b) Discuss about non linear spatial filtering in detail.
- 17. (a) Explain high pass frequency domain filters.

Or

(b) Explain image restoration process.

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18. (a) Discuss about color transformation in detail.

Or

- (b) What is the purpose of NTSC color space? Explain in detail.
- 19. (a) With a neat diagram explain JPEG compression.

Or

- (b) Explain gray scale morphology.
- 20. (a) Write a brief note on basic global thresholding.

 \mathbf{Or}

(b) Explain the usage of chain codes in detail.

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