

(6 pages)

Reg. No. :

Code No. : 7629

Sub. Code : KCSM 32/
PCSM 31

M.Sc.(CBCS) DEGREE EXAMINATION,
NOVEMBER 2019.

Third Semester

Computer Science

DIGITAL IMAGE PROCESSING

(For those who joined in July 2016 and afterwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Digitizing the coordinate values is called _____.

(a) Convolution

(b) Correlation

(c) Sampling

(d) Quantization

2. Which of the following expression is used to denote spatial domain process?

(a) $g(x,y) = T[f(x,y)]$ (b) $f(x+y) = T[g(x+y)]$

(c) $f(x,y) = T[g(x,y)]$ (d) $g(x+y) = T[f(x+y)]$

3. Which of the following is the primary objective of sharpening of an image?

(a) Blurring

(b) Highlight fine details

(c) Increase the brightness

(d) Decrease the brightness

4. What is the full form for PDF, a fundamental descriptor of gray values in an image?

(a) Probability distribution function

(b) Pixel density function

(c) Pixel distributing function

(d) Probability density function

5. if an image is given in RGB format then the intensity (I) component of each RGB pixel is obtained by the equation.

(a) $I = (1/3)(R+G+B)$ (b) $I = (1/3)(R+G+B)$

(c) $I = (1/3)(R+G+B)$ (d) $I = (1/3)(R+G+B)$

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6. The average number of bits required to represent each pixel is
- (a) $\sum_{K=1}^L l(r_k) p_r(r_k)$ (b) $\sum_{K=1}^L l(r_k) / p_r(r_k)$
- (c) $\sum_{K=1}^L l(r_k) + p_r(r_k)$ (d) $\sum_{K=1}^L l(r_k) - p_r(r_k)$
7. DWT applied on an image creates _____
- (a) Approximation and horizontal coefficients
(b) Detail and diagonal coefficients
(c) Approximation and detail coefficients
(d) Detail and vertical coefficients
8. The closing of gray-scale image 'f' by structuring element 'b' is defined as
- (a) $(f \ominus b) \oplus b$ (b) $(f \oplus b) \ominus b$
- (c) $(f \oplus b) \oplus b$ (d) $(f \ominus b) \ominus b$
9. _____ is a tool used in watershed transform for segmentation.
- (a) Predicate (b) Distance transform
(c) Splitmerge (d) Regiongrow
10. The skeleton of all regions in a binary image is generated by _____ function.
- (a) bwmorph (b) bwperim
(c) bwlabel (d) bwboundaries

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PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Explain how a digital image is represented?

Or

- (b) Explain Logarithmic and Contrast Stretching Transformation.

12. (a) Write briefly about 2D Fourier Transform.

Or

- (b) Explain how to model the degraded function.

13. (a) What is CMY colour space? Explain.

Or

- (b) Write notes on Inverse Wavelet Transform.

14. (a) Explain the working principle of Lossless Predictive model.

Or

- (b) Discuss briefly about Hit-or-Miss Transformation.

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15. (a) Write short notes on line detection.

Or

- (b) How to computer Fourier descriptors of a boundary.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Explain

- (i) Structure of Mfiles
- (ii) Arithmetic operators in MATLAB

Or

- (b) Discuss the types of Spatial filtering.

17. (a) Give an account on filtering in frequency domain.

Or

- (b) Explain the concepts behind noise models.

18. (a) Discuss the operations carried out in RGB vector space.

Or

- (b) Explain Fast Wavelet Transform.

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19. (a) Explain the steps followed in JPEG compression.

Or

- (b) Give an account on Dilation and Erosion.

20. (a) Explain Region based Segmentation in detail.

Or

- (b) What are various approaches used to represent a boundary?
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