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Reg. No. :

Code No. : 10524 E Sub. Code : CECS 62

B.Sc. (CBCS) DEGREE EXAMINATION,
APRIL 2024

Sixth Semester

Computer Science

Major Elective — INTRODUCTION TO DIGITAL
IMAGE PROCESSING

(For those who joined in July 2021-2022)

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

6. Which is a colour attribute that describes a pure colour?
 - (a) Saturation
 - (b) Hue
 - (c) Brightness
 - (d) Intensity
7. The number of grey values are integer powers of _____.
 - (a) 4
 - (b) 2
 - (c) 8
 - (d) 1
8. If inner region of object is textured then approach we use is _____.
 - (a) Discontinuity
 - (b) Similarity
 - (c) Extraction
 - (d) Recognition
9. Approach to image restoration is _____.
 - (a) Inverse filtering
 - (b) Spike filtering
 - (c) Black filtering
 - (d) Ranking
10. Enhancement of differences between images is based on the principle of _____.
 - (a) Additivity
 - (b) Homogeneity
 - (c) Subtraction
 - (d) Multiplication

2. The amount of luminous flux falling on a given area of surface is called as _____.
 - (a) Aperture
 - (b) Contrast
 - (c) Brightness
 - (d) Luminance
3. Digitization of spatial co-ordinates (x, y) is called _____.
 - (a) Gray level quantization
 - (b) Finite sampling
 - (c) Image sampling
 - (d) Image quantization
4. The range of values spanned by the gray scale is called _____.
 - (a) Dynamic range
 - (b) Band range
 - (c) Peak range
 - (d) Resolution range
5. Which of the following is the primary objective of sharpening of an image?
 - (a) Blurring the image
 - (b) Highlight fine details in the image
 - (c) Increase the brightness of the image
 - (d) Decrease the brightness of the image

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) How to represent the digital images? Explain.

Or

(b) Show the definition of image and digital image processing.
12. (a) Describe the basics of spatial filtering.

Or

(b) Write down the basic gray level transformation.
13. (a) Explain the purpose of color segmentation.

Or

(b) Distinguish between the color image smoothing and sharpening.
14. (a) Point out the mathematical analysis in image compression.

Or

(b) Determine the various types of compression strategies.

15. (a) Highlight the salient features of an image:

Or

(b) Summarize the methods of region based segmentation.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Discuss the fundamental steps in digital image processing.

Or

(b) Conclude the implementation of visual perception with diagram.

17. (a) Examine the histogram processing and function plotting.

Or

(b) What are the basics of filtering in the frequency domain? Explain.

18. (a) Illustrate the two dimensional Fourier transform and its inverse.

Or

(b) Outline the categories of color image processing.

19. (a) Draw and explain the concept of image compression model.

Or

(b) Evaluate the logic operations involving binary images.

20. (a) Formulate the steps by steps process of feature extraction.

Or

(b) Analyze the attributes of features in image segmentation.