Seat No.

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MAR_APR 2025 SUMMER EXAMINATION

11731 Bachelor of Technology (NEP-2.0)

Sub. Name: Image Processing

Sub. Code: 67818/83826/84052

Day and Date: MAY ,08-05-2025 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:
1. **All questions are compulsory**
2. **Assume suitable data wherever necessary and mention it boldly**
3. **Draw neat labelled diagrams wherever necessary**
4. **Figures to the right indicate full marks**

Q1) Solve following MCQ. **[14]**

i. Which of the following operation is done on the pixels in sharpening the image, in the spatial domain?

A. Differentiation
B. Median
C. Integration
D. Average

ii. Compute the Euclidean Distance (D1), City-block Distance (D2) and Chessboard distance (D3) for points p and q, where p and q be (1, 2, 3) and (1, 5, 7) respectively. Give answer in the form (D1, D2, D3).

A. (5, 3, 4)
B. (5, 4, 3)
C. (7, 5, 4)
D. (5, 7, 4)

iii. In frequency domain, what is the equivalent operation of product of two functions in spatial domain?

A. correlation
B. convolution
C. Fourier transform
D. fast Fourier transform

iv. For an image, the type of Interpolation where the intensity of the four neighboring pixels is used to obtain intensity a new location is called _____.

A. Bilinear interpolation
B. Cubic interpolation
C. Bicubic interpolation
D. Nearest neighbor interpolation

v. In the coding redundancy technique we use

A. fixed length code
B. variable length code
C. byte
D. Both A and B

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

A. Decrease the brightness of the image
B. Increase the brightness of the image
C. Highlight fine details in the image
D. Blurring the image

vii. Full-color images have at least?

A. 2 components
B. 3 components
C. 4 components
D. 5 components

Q2) Answer any Two questions **[14]**

a. Describe image sampling and quantization. **[7]**

b. Explain bit plane slicing for image enhancement **[7]**

c. Explain image acquisition using a single sensor **[7]**

Q3) Answer any Two questions **[14]**

a. Explain the Laplacian used for image sharpening **[7]**

b. Illustrate histogram of an image and demonstrate the significance of histogram equalization. **[7]**

c. Demonstrate sharpening filters in frequency domain **[7]**

Q4) Answer any Two questions **[14]**

a. Describe Global thresholding with an example **[7]**

b. Explain the region splitting and merging algorithm in detail. **[7]**

c. What is a colour model? Show various colour models. **[7]**

Q5) Answer any Two questions **[14]**

a. Explain general image compression model with neat block diagram **[7]**

b. Explain opening and closing operations with their applications. **[7]**

c. Explain the hit-or-miss transformation **[7]**

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (101) Bachelor of Engineering (67818) DIGITAL IMAGE PROCESSING Part 4 SEM 8
2] (101) Bachelor of Engineering (84052) Image Processing Part 4 SEM 7
3] (1154) B.Tech. CBCS (83826) Image Processing Part 4 SEM 7