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MAR_APR 2026 SUMMER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Image Processing

Sub. Code: 67818/83826/84052

Day and Date: Monday ,18-05-2026 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:
1. **All questions are compulsory**
2. **Draw neat labelled diagrams wherever necessary**
3. **Figures to the right indicate full marks**
4. **Use of Scientific calculator is allowed**

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

i. Choose the correct sequence of operations in Image Digitization

A. Quantization, Sampling, Storage
B. Storage, Sampling, Quantization
C. Sampling, Quantization, Storage
D. None of Above

ii. 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

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. Dilation followed by erosion is called ..... operation ?

A. erosion
B. opening
C. closing
D. dilation

v. First derivatives in image segmentation produces

A. thick edge
B. thin edge

C. fine edge
D. none of the above

vi. Full-color images have at least?
A. 2 components
B. 3 components
C. 4 components
D. 5 components

vii. 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

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

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

b. Explain the image histogram and the need for histogram equalization **[7]**

c. Discuss the non linear smoothing (order statistic) filters in spatial domain **[7]**

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

a. Describe the fundamental steps in digital image processing. **[7]**

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

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

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

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

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

c. Define image compression ratio. Explain fidelity criteria. **[7]**

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

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

b. Determine method to detect a point in an image, explain with an example. **[7]**

c. Explain RGB and HSV color model **[7]**

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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

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