JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

B.Tech VI Semester (ECE)

COURSE CODE (CREDITS): 18B1WEC536 (3) MAX. MARKS: 25

COURSE NAME: Fundamentals of Digital Image Processing

COURSE INSTRUCTORS: Lt. Pragya Gupta MAX. TIME: 1 Hour 30 Minutes

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

<table>
<tr><th>Q.No</th><th>Question</th><th>CO</th><th>Marks</th></tr>
<tr><td>Q1</td><td>What is meant by image enhancement in the spatial domain? Briefly explain the role of intensity transformation functions in enhancing images. Illustrate with an example of a basic image enhancement technique (such as contrast stretching or thresholding).</td><td>2</td><td>5</td></tr>
<tr><td>Q2</td><td>Define the term "Digital Image." Explain the process of converting a continuous image into its digital form. How do spatial and intensity resolutions influence the quality of a digital image?</td><td>1</td><td>5</td></tr>
<tr><td>Q3</td><td>Given a 3-bit image with the following pixel intensity distribution:
<table>
<tr><th>Intensity Level</th><th>Frequency</th></tr>
<tr><td>0</td><td>5</td></tr>
<tr><td>1</td><td>15</td></tr>
<tr><td>2</td><td>25</td></tr>
<tr><td>3</td><td>30</td></tr>
<tr><td>4</td><td>25</td></tr>
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Perform histogram equalization on the image. Show the steps involved and calculate the new intensity levels. Draw the Histogram of the image before and after Histogram Equalization.</td><td>2</td><td>3</td></tr>
<tr><td>Q4</td><td>Consider a 5x5, 8-bit gray scale image corrupted by the salt and pepper noise. Apply the median filter, Max filter and Min filter on the image. Draw the output image after applying all the three filters and discuss the result. To avoid problems at the edge of the image you only need to calculate the filtered values for the central 3x3 region.</td><td>6</td><td>6</td></tr>
<tr><td>Q5</td><td>Given an image ‘I’ of size 5x5. Apply Box filter and Prewitt operator on the given image. Show the enhanced image and discuss the result. To avoid problems at the edge of the image you only need to calculate the filtered values for the central 3x3 region.
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