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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**MAKE-UP EXAMINATION JULY 2024**

**Course Code**: CSE3081

**Course Name**: DIGITAL IMAGE PROCESSING

**Program**: B.Tech,

**Date:** 19-07-2024

**Time**: 1.30 PM to 4.30 PM

**Max Marks**: 100

**Weightage**: 50%

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. Scientific and Non-programmable calculators are permitted.

**Part A [Memory Recall Questions]**

**Answer all the Questions. Each question carries 01 mark. (20Qx 1M= 20M)**

1. Digital images are displayed as a discrete set of .: (CO1, Knowledge)
   1. values
   2. numbers
   3. frequencies
   4. intensities
2. What is the output of a smoothing, linear spatial filter?
   1. Median of pixels
   2. Maximum of pixels
   3. Minimum of pixels
   4. Average of pixels
3. The sharpness and accuracy of an image is basically known as? : (CO3, Knowledge)
   1. Illumination
   2. Resolution
   3. Quantization
   4. Scaling
4. Lossy compression is useful in what type of imaging? : (CO3, Knowledge)
   1. Military imaging
   2. Space imaging
   3. Medical imaging
   4. Television broad casting
5. Smoothing linear filter is also known as median filter.
   1. TRUE
   2. FALSE
   3. Cant Say
   4. Neither true nor false
6. Usage of Power law transformation is in? : (CO1, Knowledge)
   1. purification
   2. industry
   3. radar
   4. MRI
7. Digitizing the coordinate values of a continuous image is called? : (CO1, Knowledge)
   1. Compression
   2. Quantization
   3. Sampling
   4. Segmentation
8. \_ is the total amount of energy that flows from light source.: (CO1, Knowledge)
   1. Radiance
   2. Darkness
   3. Brightness
   4. Luminance
9. A continuous image is digitised at \_ \_ points.: (CO1, Knowledge)
   1. random
   2. vertex
   3. contour
   4. sampling
10. The transition between continuous values of the image function and its digital equivalent is called \_ : (CO1, Knowledge)
    1. Quantisation
    2. Sampling
    3. Rasterisation
    4. None of the Mentioned
11. Images quantised with insufficient brightness levels will lead to the occurrence of

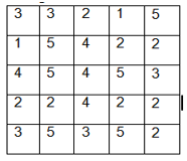
\_: (CO1, Knowledge)

* 1. Pixillation
  2. Blurring
  3. False Contours
  4. None of the Mentioned

1. The smallest discernible change in intensity level is called : (CO1, Knowledge)
   1. Intensity Resolution
   2. Contour
   3. Saturation
   4. Contrast
2. Which of the following is not a medical application of digital image processing?: (CO1, Knowledge)
   1. Ultrasonic scanning
   2. Cineangiograms
   3. CCTV
   4. Nuclear Magnetic Resonance
3. CAT ia an application of image processing what it Stands for? : (CO1, Knowledge)
   1. Computer Aided Telegraphy
   2. Computer Aided Tomography
   3. Computerized Axial Telegraphy
   4. Computerized Axial Tomography
4. Where do you find frequent use of Gradient?
   1. Industrial inspection
   2. MRI Imaging
   3. PET Scan
   4. None of the mentioned
5. Digitizing the amplitude values is called? : (CO1, Knowledge)
   1. uniform sampling
   2. non uniform sampling
   3. quantization
   4. sampling
6. Which of the following file formats is an example of both lossless and lossy compression?: (CO1, Knowledge)
   1. PNG
   2. TIFF
   3. GIF
   4. JPEG
7. What kind of relation can be obtained between the response of first order derivative and second order derivative of an image having a transition into gray-level step from zero?
   1. First order derivative has a stronger response than a second order
   2. Second order derivative has a stronger response than a first order
   3. Both first and second order derivative has the same response
   4. None of the mentioned
8. Of the following, \_ has the maximum frequency. : (CO1, Knowledge)
   1. UV Rays
   2. Gamma Rays
   3. Microwaves
   4. Radio Waves
9. What is the third step in digital image processing?: (CO1, Knowledge)
   1. Image Restrotion
   2. Segmentation
   3. Image Enhancement
   4. Colour Image Processing

**Part B [Thought Provoking Questions]**

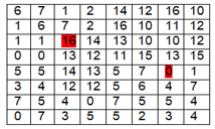
**Answer all the Questions. Each question carries 06 marks. (5Qx10M=50M)**

1. Pseudo-color processing is a technique that maps each of the grey levels of a black and white image into an assigned color. Illustrate Intensity and multi-level intensity slicing methods to achieve Pseudo coloring on a given image.: (CO4, Application).
2. Gray-scaling is the process of converting a continuous-tone image to an image that a computer can manipulate and there are many grey level transformation functions to enhance the contrast discuss any two transformation functions to increase the brightness of a low intensity image: (CO2, Comprehension).
3. The objective of using morphological operations is to remove the imperfections in the structure of image discuss dilation and erosion process which can be used to remove those imperfections and list their differences: (CO4, Comprehension).
4. Histogram of an Image can be used to understand the intensity distributions. Illustrate the concept of Histogram Equalization technique for Image enhancement using following 5X5 image.(CO2, Application). 
5. A binary image is one that consists of pixels that can have one of exactly two colors, usually black and white. Discuss the process of converting a grey scale image into its binary equivalent and list out its practical applications. (CO1, Comprehension).

**Part C [Problem Solving Questions]**

**Answer all the Questions. Each question carries 15 marks. (2Qx15M=30M)**

1. Image segmentation is typically used to locate objects and boundaries (lines, curves, etc.) in images.For a given image show the result of region growing algorithm and region split and merge algorithm.(T=7)(Seed values are highlighted in red color): (CO4, Comprehension).



1. Images having a higher contrast level generally display a greater degree of color or grayscale variation than those of lower contrast. Explain the process of Histogram stretching. For a given 4x4 image having gray scales between [0,9] perform histogram equalization and draw the histogram of the image before and after equalization to achieve contrast enhancement. (CO2, Application).

