PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2021- 22 Examination

Semester: 8   Date: 28/03/2022
Subject Code: 203112482   Time: 10:30 am to 01:00 pm
Subject Name: Digital Image Processing   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 **Objective Type Questions** - (Fill in the blanks, one word answer, MCQ-not more than five in case **(15)** of MCQ) (All are compulsory) (Each of one mark)

1. Which of the following is the next step in image processing after compression?
   a) Representation and description   b) Morphological processing
   c) Segmentation   d) Wavelets
2. What is the general form of representation of log transformation?
   a) $s=clog_{10}(1/r)$ b) $s=clog_{10}(1*r)$
   c) $s=clog_{10}(1+r)$ d) $s=clog_{10}(1-r)$
3. Dark characteristics in an image are better solved using _____
   a) Laplacian Transform   b) Gaussian Transform
   c) Histogram Specification   d) Power-law Transformation
4. What does Image Differentiation enhance?
   a) Edges   b) Pixel Density
   c) Contours   d) None of the mentioned
5. The aliasing effect on an image can be reduced using which of the following methods?
   a) By reducing the high-frequency components of image by clarifying the image
   b) By increasing the high-frequency components of image by clarifying the image
   c) By increasing the high-frequency components of image by blurring the image
   d) By reducing the high-frequency components of image by blurring the image
6. The most familiar single sensor used for Image Acquisition is _____
7. 512 x 512 image has resolution of_____.
8. JPEG stands for _____
9. _____is known as the highlighting the contribution made to total image by specific bits instead of highlighting intensity-level changes.
10. If f(x,y) is an image function of two variables, then how the first order derivativeof a one-dimensional function, f(x) can be defined.
11. Which filter, in correspondence to lowpass filtering in spatial domain, is in frequency domain?
12. List out the applications of Digital Image Processing.
13. Define the term: 8-adjacency
14. Which tool is used in tasks such as zooming, shrinking, rotating, etc.?
15. What is the sum of all components of a normalized histogram?

Q.2 **Answer the following questions. (Attempt any three)**   **(15)**

 A) What is the importance of Image sampling and quantization in Digital Image Processing?

 B) Write a brief note on Laplacian operator.

 C) What is histogram? Explain histogram equalization in detail.

 D) Explain Power-Law transformations. What is gamma correction?

Q.3 A) Apply the Median filter for given Image.   **(07)**
   A =

4	6	7	9	11
2	3	5	4	8
15	1	18	30	10
13	4	25	5	7
4	18	12	8	3

   B) Prove that opening and closing are duals of each other.   **(08)**
                                      OR
   B)Define Image Restoration and compare it with Image Enhancement   **(08)**

Q.4 A) Draw the block diagram of Image enhancement in frequency domain and explain in brief. **(07)**

<div align="center">**OR**</div>

A) Explain motivation and implementation of homomorphic filter approach for image enhancement. **(07)**

B) List out and brief about various point processing techniques used for image enhancement. **(08)**