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MCS-230

**MASTER OF COMPUTER
APPLICATIONS (MCA-NEW)**

Term-End Examination

June, 2024

**MCS-230 : DIGITAL IMAGE PROCESSING AND
COMPUTER VISION**

Time : 3 Hours

Maximum Marks : 100

Note : (i) *Question No. 1 is compulsory.*

(ii) *Attempt any **three** questions from the
rest.*

1. (a) Explain briefly the optical image processing, analog image processing and digital image processing. 5
- (b) What is the role of sampling and quantization in the process of digitization ? 5
- (c) Discuss the importance of image enhancement in image processing. 5

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- (d) Compute discrete Fourier transform of the 1 D sequence $f(x) = [1, 0, -1, 0]$. 5
- (e) What are basic properties of Fourier transform ? Discuss in brief. 5
- (f) Explain in brief the inverse filtering approach and its limitations in image restoration. 5
- (g) What are the basic properties of Bayes classifiers ? 5
- (h) Differentiate between supervised and unsupervised learning approaches with the help of an example. 5
2. (a) Given an image is a gray scale image with aspect ratio of 6 : 2 and pixel resolution of 480000 pixels. Calculate the following : 10
- (i) Resolve pixel resolution to calculate the dimensions of image.
- (ii) The size of the image.

- (b) Write short notes on the following : 10
- (i) Image processing and computer graphics
 - (ii) Image processing and machine vision
 - (iii) Image processing and video processing
3. (a) Define the concept of Histogram matching with an appropriate example. 10
- (b) Explain image degradation and also discuss the types of image degradation in detail. 10
4. (a) Write short notes on the following : 10
- (i) Gaussian Noise
 - (ii) Rayleigh Noise
 - (iii) Gamma Noise
- (b) Describe how the grey levels vary in RGB primary images that make up the front face of the colour cube. 10
5. (a) Explain K-means clustering algorithm with a suitable example. 10

(b) Write short notes on the following : 10

(i) Feature Vector

(ii) Feature Space

(iii) Decision Region and Decision Boundary

(iv) Hyperplanes and Hypersurfaces