Subject Code: KCA025

PAPER ID-311789

Roll No: | | | | | | | | | | | | | |

MCA
(SEM III) THEORY EXAMINATION 2023-24
DIGITAL IMAGE PROCESSING

TIME: 3HRS **M.MARKS: 100**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief.

Q no.	Question	Marks	CO
a.	Differentiate between RGB image and Grey scale image.	2	1
b.	Briefly explain the importance of sampling operation.	2	1
c.	What do you mean by Homomorphic filter?	2	2
d.	Briefly discuss the idea of smoothing filters.	2	2
e.	What are the various factors that can cause image degradation?	2	3
f.	How does a band pass filter work?	2	3
g.	What is region based segmentation?	2	4
h.	Explain the concept of thresholding in brief.	2	4
i.	State any four advantages of chain code.	2	5
j.	Why vector quantization is used?	2	5

SECTION B

2. Attempt any *three* of the following:

Q no.	Question	Marks	CO
a.	What is Fourier transform? Discuss Fast Fourier transform algorithm.	10	1
b.	Explain and compare Ideal and Butterworth filters.	10	2
c.	What do you understand by mean filter? Explain various types of mean filters with example.	10	3
d.	Discuss Roberts and Prewitt first order edge detection operators.	10	4
e.	What do you mean by feature of an object? What are the characteristics of a good feature? Also differentiate between boundary based features and region based features.	10	5

SECTION C

3. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	What are the phases of an image processing system? Discuss with the help of a diagram.	10	1
b.	Discuss image arithmetic operations with proper example.	10	1

4. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	What do you mean by Histogram equalization? Explain the process and apply Histogram Equalization technique to the following image-	10	2

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	$f(x,y)=\begin{bmatrix}1&2&3&4\\5&5&6&6\\6&7&6&6\\6&7&2&3\end{bmatrix}$		
b.	Explain various properties of Fourier transform.	10	2

5. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Explain in detail the image degradation model with diagram.	10	3
b.	What is an order statistics filter? Explain the types of order statistics filter.	10	3

6. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	What is the use of morphological operations? Discuss morphological dilation and erosion operations with example.	10	4
b.	What is Hough transform? Explain its concept and algorithm.	10	4

7. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	What do you mean by lossless compression? Explain Run length coding algorithm with example.	10	5
b.	Describe various shape features for regional descriptors.	10	5