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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

M.Tech. (First Semester) Regular Examinations, February – 2025

24MECPC11002 –Digital Image and Video Processing

(ECE)

Time: 3 hrs | Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions		CO #	Blooms Level
a.	Describe the process of change detection in digital images.	CO1	K1
b.	How does thresholding contribute to image segmentation?	CO2	K2
c.	What is motion segmentation, and where is it commonly applied?	CO3	K2
d.	Explain the HSB color model in image processing.	CO4	K1
e.	In the context of image processing, define a region and a boundary.	CO2	K2

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions		Marks	CO #	Blooms Level
2. a.	Explain the concept of sampling in digital image processing.	5	CO1	K2
b.	Describe the Fourier transform and discuss its key properties	5	CO1	K3
	(OR)			
c.	Explain various color models used in image processing and their applications.	5	CO1	K1
d.	Define RGB color model. Provide a detailed explanation.	5	CO1	K3
3.a.	Discuss different image enhancement techniques applied in digital image processing.	5	CO2	K2
b.	Explain the process of histogram equalization, contrast stretching, and other spatial domain techniques for image enhancement.	5	CO2	K4
	(OR)			
c.	Describe the role of frequency domain methods in image enhancement with relevant examples.	5	CO2	K4
d.	Define pseudo-color image processing. Provide an example where it is beneficial.	5	CO2	K3
4.a.	Outline the fundamental steps involved in digital image processing systems.	5	CO3	K2
b.	Compare and contrast the applications of Discrete Fourier Transform (DFT) and Discrete Cosine Transform (DCT) in image analysis.	5	CO3	K3
	(OR)			
c.	Define a histogram and explain histogram processing with an example.	5	CO3	K2
d.	Provide a detailed explanation of deinterlacing techniques used to improve video quality.	5	CO3	K3
5.a.	Explain in detail the homomorphic filtering technique and give a suitable example.	5	CO4	K4
b.	Discuss the aliasing effect and its impact on image quality.	5	CO4	K3
	(OR)			

c.	Explain various techniques used in frequency domain image enhancement with suitable illustrations.	5	CO4	K1
d.	Discuss different approaches to region-based image segmentation and their representation techniques.	5	CO4	K2
6.a.	Describe the key algorithms for 2D motion estimation in image restoration.	5	CO2	K3
b.	Write the fundamental principles of color processing in digital images.	5	CO1	K3
	(OR)			
c.	Explain region representation techniques in digital image processing.	5	CO1	K1
d.	Provide an overview of mean filtering techniques and their types.	5	CO3	K3

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