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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

Ph.D. (First Semester) Examinations, December – 2024

23SPPEEC1011 – Digital Image and Video Processing

(ECE)

Time: 3 hrs Maximum: 70 Marks

The figures in the right hand margin indicate marks.

	Answer *ANY FIVE* Questions. (14 x 5 = 70 Marks)	**Marks**
1.a.	Define image and video sampling. What is the difference between 2-D and 3-D sampling, and how does each apply to digital media?	8
b.	Describe the Discrete Fourier Transform (DFT) and Discrete Cosine Transform (DCT). How are they used in image processing?	6
2.	Discuss about different types of transforms used in image processing and explain its applicability in terms of domains.	14
3.a.	Describe the process of point processing in image enhancement. Give examples of operations that can be performed through point processing.	7
b.	Explain motion-compensated filtering and its applications in video resolution enhancement. How does it improve video quality?	7
4.	What is motion segmentation, and how is it achieved in video analysis? Describe its role in simultaneous motion estimation and segmentation.	14
5.a.	Explain the role of morphological image processing in video object segmentation. How does it support scene change detection?	7
b.	Discuss the differences between line detection and edge detection in image segmentation. What techniques are used for each?	7
6.a.	Describe various color models (RGB, CMY, HSI, etc.) used in color image processing. What are the unique features of each?	7
b.	Explain the difference between full-color processing and pseudo-color processing. How is each applied in digital media?	7
7.	Discuss about different image segmentation approaches. Describe Watershed transformation in detail with the help of a neat diagram.	14
8.a.	Describe boundary representation and boundary descriptors in object recognition. How are they used to represent image features?	7
b.	Explain regional descriptors and their significance in feature representation. What are some common techniques for defining regional descriptors?	7

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