Reg. No.																

Question Paper Code	13906

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Seventh Semester

Electronics and Instrumentation Engineering

20EIEL703 - INTRODUCTION TO VIDEO AND IMAGE PROCESSING

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	A digital image is represented as a matrix of: (a) Gray scale patterns (b) Pixels (c) Colors (d) Histograms	1	K1	CO1
2.	The Discrete Fourier Transform (DFT) is used to: (a) Compress images (b) Analyze image frequency components (c) Filter noise only (d) Rotate images	1	K1	CO1
3.	Which of the following is not a point processing method? (a) Histogram equalization (b) Contrast stretching (c) Gray level slicing (d) Median filtering	1	K1	CO2
4.	Histogram equalization is used to: (a) Improve image contrast (b) Reduce image size (c) Rotate image (d) Suppress noise	1	K1	CO2
5.	The watershed segmentation method is based on: (a) Histogram analysis (b) Topographical representation of images (c) Spatial filtering (d) Color balancing	1	K1	CO3
6.	Which method is NOT a region-oriented segmentation technique? (a) Region growing (b) Region splitting (c) Region merging (d) Sobel operator	1	K1	CO3
7.	A median filter is effective in removing: (a) Gaussian noise (b) Impulse noise (c) Motion blur (d) Compression artifacts	1	K1	CO4
8.	Motion compensation is used in video compression to: (a) Add redundancy (b) Predict future frames (c) Reduce motion blur (d) Increase bit rate	1	K1	CO4
9.	The main purpose of inter-frame processing is to: (a) Reduce noise within a frame (b) Enhance motion information (c) Detect colors (d) Reduce spatial resolution	1	K1	CO5
10.	Deep learning models like YOLO and Faster R-CNN are commonly used for: (a) Object filtering (b) Object detection and tracking (c) Color segmentation (d) Motion compensation	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Interpret how 2D images are obtained.	2	K2	CO1
12.	Illustrate the basic components of an image processing system.	2	K2	CO1
13.	Explain how the HSI color model represents color information.	2	K2	CO2
14.	Illustrate spatial filtering in image processing.	2	K2	CO2
15.	Explain how pattern recognition is used in computer vision.	2	K2	CO3
16.	Compare supervised and unsupervised classification techniques.	2	K2	CO3
17.	Demonstrate how intra-frame and inter-frame processing differ using suitable examples.	2	K2	CO4
18.	Explain the purpose of background subtraction in video analysis.	2	K2	CO4
19.	Interpret how artificial intelligence contributes to medical image analysis.	2	K2	CO5

20.	Summarize hyper spectral imaging and how it is useful in agriculture.		*2*	*K2*	*CO5*
21.	Explain how image acquisition is carried out in digital image processing.		*2*	*K2*	*CO1*
22.	Summarize the role of point processing in image enhancement with suitable examples.		*2*	*K2*	*CO2*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Interpret the components of human visual perception and explain their role in the development of image processing systems.	*11*	*K2*	*CO1*
		OR			
	b)	Explain the concepts of image sampling and quantization, and describe their significance in image digitization.	*11*	*K2*	*CO1*
24.	a)	Illustrate the concept of a histogram in digital images and explain its usefulness in image enhancement.	*11*	*K2*	*CO2*
		OR			
	b)	Infer the concept of gray level slicing and outline its types and applications in image processing.	*11*	*K2*	*CO2*
25.	a)	Demonstrate the concept of region-oriented segmentation. Explain region growing, region splitting, and merging methods.	*11*	*K2*	*CO3*
		OR			
	b)	Explain the watershed segmentation technique and mention its merits and demerits.	*11*	*K2*	*CO3*
26.	a)	Make use of the principles of object tracking to explain how tracking by detection operates in dynamic scenes.	*11*	*K3*	*CO4*
		OR			
	b)	Apply how spatial and temporal filtering techniques work together to improve motion clarity and reduce noise in videos.	*11*	*K3*	*CO4*
27.	a)	Analyze and explain the use of remote sensing and satellite imaging in agriculture.	*11*	*K4*	*CO5*
		OR			
	b)	Analyze the various steps involved in medical image segmentation and examine how each step contributes to its applications in medical diagnostics and treatment planning.	*11*	*K4*	*CO5*
28.	a)	Examine and explain how deep learning techniques are utilized in medical image analysis.	*11*	*K4*	*CO5*
		OR			
	b)	Analyze the concept of machine vision to explain how it can be used for quality control in the food processing industry.	*11*	*K4*	*CO5*