Reg. No.																

Question Paper Code	13951

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

Fifth Semester

Computer Science and Engineering (AIML)

20AMPC501 - COMPUTER VISION 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.	Which library in Python is widely used for real-time computer vision applications? (a) Matplotlib (b) OpenCV (c) Scikit-Learn (d) PyTorch	1	K1	CO1
2.	The process of converting an image into digital form is called: (a) Image Segmentation (b) Image Acquisition (c) Image Filtering (d) Image Classification	1	K1	CO1
3.	SURF is an improvement over SIFT mainly because it: (a) Uses fewer keypoints (b) Runs faster using integral images (c) Uses deep learning (d) Works on frequency domain	1	K1	CO2
4.	FAST and ORB are used for: (a) Feature detection (b) Feature normalization (c) Image smoothing (d) Clustering	1	K1	CO2
5.	Which of the following methods is used for edge-based segmentation? . (a) Thresholding (b) Region growing (c) Canny detector (d) K-means	1	K1	CO3
6.	The process of grouping pixels with similar properties is called: (a) Clustering (b) Filtering (c) Sampling (d) Quantization	1	K1	CO3
7.	Which machine learning models are widely used for 3D object classification in computer vision tasks? (a) Generative adversarial networks (GANs) (b) Reinforcement learning (c) Convolutional neural networks (CNNs) (d) Transfer learning	1	K1	CO4
8.	YOLO algorithm is based on: (a) Regression (b) Classification (c) Clustering (d) Segmentation	1	K1	CO4
9.	Which platform focuses on manufacturing and inspection processes? (a) PyTorch (b) TensorFlow (c) Roboflow (d) Landing AI	1	K1	CO5
10.	Which of the following is the purpose of using patches around tracked points in optical flow analysis? (a) To enhance image contrast (b) To detect edges (c) To compute feature vectors (d) To accurately determine displacement	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Define computer vision. How is it different from image processing.	2	K1	CO1
12.	Outline two functions available in Pillow for image resizing and cropping.	2	K2	CO1
13.	Compare edge detection and feature extraction.	2	K2	CO2
14.	List the steps in detecting and matching features between two images.	2	K1	CO2
15.	Interpret region merging.	2	K2	CO3
16.	Explain distance metrics in clustering algorithms.	2	K2	CO3
17.	Name any two applications of object detection.	2	K1	CO4
18.	Compare training and validation datasets.	2	K2	CO4
19.	What is TensorFlow and why is it widely used for computer vision tasks?	2	K1	CO5
20.	Recall any two popular computer vision frameworks.	2	K1	CO5

21.		Explain real-time decision-making in autonomous systems using computer vision.	*2*	*K2*	*CO6*
22.		Summarize the challenges in applying computer vision models to robotics.	*2*	*K2*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Summarize the workflow of computer vision applications from input image to decision-making.	*11*	*K2*	*CO1*
		OR			
	b)	Demonstrate image reading, resizing, and display operation using OpenCV program.	*11*	*K2*	*CO1*
24.	a)	Identify the steps in feature extraction pipeline from input image to matching output.	*11*	*K3*	*CO2*
		OR			
	b)	Apply scale and transformation invariant feature detection techniques.	*11*	*K3*	*CO2*
25.	a)	Explain various image segmentation techniques with examples.	*11*	*K2*	*CO3*
		OR			
	b)	Illustrate the working of K-means clustering algorithm and mention its merits and demerits.	*11*	*K2*	*CO3*
26.	a)	Build YOLO object-detection model with suitable explanation.	*11*	*K3*	*CO4*
		OR			
	b)	Build the CNN for Image classification task using convolution, pooling, and fully connected layers.	*11*	*K3*	*CO4*
27.	a)	Compare OpenCV and TensorFlow frameworks based on their functionalities and use cases.	*11*	*K2*	*CO5*
		OR			
	b)	Explain the workflow for training and deploying an object recognition model using Tensorflow.	*11*	*K2*	*CO5*
28.	a)	Identify the role of computer vision in robotics and autonomous navigation systems.	*11*	*K3*	*CO6*
		OR			
	b)	Build a deep learning model for real-time object tracking in drones.	*11*	*K3*	*CO6*