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Bengaluru

Mid Term Examinations - October 2026

Date: 06/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: ECE3107 **Course Name:** Machine Vision for Robotics

Semester: Seventh Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2	CO3	CO4
Marks	24	24	22	20

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	There are different types of light sources that are commonly used in machine vision. List any two advantages and disadvantages of Fluorescent lamps used in machine vision system.	2	CO1	BT1
2	When an object is observed by human eye, it is first focused through the cornea, lens and then onto the retina. The image capturing receptors of the retina are termed rods and cones. Differentiate between rods and cones.	2	CO1	BT1
3	Name the geometric transformation that is typically used to rectify parts of images that show objects that are circular or that are contained in circular rings in the image.	2	CO2	BT1
4	Image interpolation is a technique used to estimate pixel intensity values at non integer locations. Which interpolation produces a jagged appearance.	2	CO2	BT2
5	What are the factors that should be considered in designing an object recognition system?	2	CO3	BT2

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	To reduce the smearing problem that occurred in full frame sensor, the frame transfer sensor is used. With a neat diagram, explain the working of frame transfer sensor, its advantages and disadvantages.	10	CO1	BT2
7	Consider an automated inspection system used to check the dimensions of manufactured components. Identify the essential elements of the machine vision system and explain how each element contributes to detecting and reporting defective parts.	10	CO1	BT2

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	Define image enhancement. Despite best efforts in controlling the illumination, in some cases it is necessary to modify the gray values of the image. Explain any two gray value transformations that are used for improving the contrast of an image.	10	CO2	BT2
9	a. Noise can be regarded as a stationary stochastic process. List the different types of noises that can affect an image . b. Explain spatial averaging technique of denoising an image.	10	CO2	BT2

PTO (Please Turn Over)

PART D: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
10	a) List the interior orientation parameters and relative orientation parameters involved in camera during the reconstruction of 3D positions for corresponding points in the two images. b) Draw the stereo geometry of two cameras and explain the different components involved.	10	CO3	BT2
11	Object recognition using only a single view is a challenging task in computer vision due to the limited information available from a single perspective. Explain the steps followed in single view recognition. List its benefits and challenges.	10	CO3	BT2

PART E: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
12	What is iconic image processing? Why YCbCr colour space is preferred over RGB whenever there are changes in light intensity? List the formulas used to change RGB to YCrCb.	10	CO4	BT2
13	A robot such as the Pioneer 3-AT does not typically carry an onboard cluster. Explain how vision and tracking is used to follow a lane.	10	CO4	BT2