PRN No.	

Total No. of Printed Pages: 2

PAPER CODE	U225-299C (ESE)

(AY:2024-25) May 2025 (ENDSEM) EXAM

SY (SEMESTER - II)

COURSE NAME: INTRODUCTION TO ROBOTICS AND APPLICATION

BRANCH: OPEN ELECTIVE

COURSE CODE: ETOEUA22239C

SY (Pattern 2023)

Time: [1Hr 30 Min]

[Max. Marks: 40]

(*) Instructions to candidates:

1) **Figures to the right indicate full marks. Use of scientific calculator is allowed**
2) **Use suitable data wherever required**
3) **All questions are compulsory. Solve any two-sub question each from Questions 1 , 2 ,3 and 4**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Explain the importance of links and joints in the anatomy of a robot.	[5]	CO1	Understand
	b) Summarize how robotic arms are categorized according to their configuration	[5]	CO1	Understand
	c) Compare the long-term benefits of investing in automation versus manual systems.	[5]	CO1	Analyze
Q2	a) Explain key characteristics such as sensitivity, resolution, and accuracy in sensors.	[5]	CO2	Understand
	b) Distinguish between passive and active sensing approaches in robotic applications.	[5]	CO2	Analyze
	c) Compare the performance characteristics of hydraulic and pneumatic actuators in terms of force output and control.	[5]	CO2	Analyze
Q3	a) Construct an H-bridge circuit model for controlling a DC motor in a mobile robot platform.	[5]	CO3	Create
	b) Create a functional block diagram of a microcontroller-based robot controller with labeled inputs, outputs, and control flow.	[5]	CO3	Create
	c) Formulate a protection strategy using sensors and logic to detect overload, overcurrent, and stall conditions in a robotic motor system.	[5]	CO3	Create

Q4	a) Explain the role of machine vision in robotic and industrial applications.	[5]	CO4	Understand
	b) Summarize the steps involved in basic image processing operations such as filtering and thresholding.	[5]	CO4	Understand
	c) Analyze the interaction between low-level image data and high-level decision-making in robotic applications.	[5]	CO4	Analyze