K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:II
Class:FY	Program:B.Tech
Branch Code:FYE	Pattern:2023
Name of Course:Fundamentals of Robotics	Course Code:2300118H
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 2 pages.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

		Marks	CO
Question No. 1			
1a)	Define precision and accuracy in robots. What factors affect them? Explain with suitable examples.	(6)	CO1, CO2
Question No. 2			
2a)	Explain the factors considered in gripper selection. Provide suitable examples for each factor.	(6)	CO3, CO5
Question No. 3			
3a)	Explain the image processing steps used in a robot vision system.	(8)	CO3, CO5
	OR		
3b)	Compare active and passive sensors used in robotics with suitable examples.	(8)	CO3, CO5
3c)	Explain the integration of sensors into robotic systems with suitable block diagrams.	(8)	CO3, CO5
	OR		
3d)	Discuss the importance of sensor fusion. Explain techniques used for combining robotic sensor data.	(8)	CO3, CO5
Question No. 4			
4a)	Explain the robot control system architecture with neat diagram.	(8)	CO4, CO5
	OR		
4b)	Discuss the design considerations for robot controllers in industrial applications.	(8)	CO4, CO5
4c)	Explain trajectory generation and control in robotic manipulators.	(8)	CO4, CO5

OR

4d)	Explain the need for real-time control in robots. Describe how real-time constraints affect controller design.	(8)	CO4, CO5

Question No. 5

5a)	Discuss the role of simulation tools in robot programming. Give examples.	(8)	CO4, CO5

OR

5b)	Describe error handling and debugging techniques in robot programming.	(8)	CO4, CO5
5c)	Explain modular programming in robotics with example applications.	(8)	CO4, CO5

OR

5d)	Explain coordinate systems used in robot programming and their significance.	(8)	CO4, CO5

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