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:VI
Class:TY	Program:B.Tech
Branch Code:ROB	Pattern:2022
Name of Course:Sensor Technology	Course Code:ROB223011
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 01page(s).
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)	Differentiate between contact and non contact sensors	(6)	CO1
Question No. 2			
2a)	What is the selection criteria of sensor in measurement system.	(6)	CO2
Question No. 3			
3a)	Draw the block diagram of digital signal processing and explain it.	(8)	CO2, CO3
	OR		
3b)	Draw the circuit diagram of instrumentation amplifier derive it's gain and output equation	(8)	CO3
3c)	Explain the working of successive approximation method of ADC with diagram	(8)	CO3
	OR		
3d)	Explain the temperature sensor interfacing with micro controller 8051with diagram.	(8)	CO3
Question No. 4			
4a)	Explain the integration of multiple sensors for enhanced performance in robotic systems	(8)	CO3, CO4
	OR		
4b)	Explain the role of Kalman filtering in sensor fusion for robotics	(8)	CO4
4c)	Explain the application of sensor fusion in localization and mapping (SLAM) for robotic systems.	(8)	CO4
	OR		

4d)	Explain the concept of feedback control systems and their importance in robotics.	(8)	CO4

Question No. 5

5a)	Explain the working principle of ultrasonic sensors and their use in mobile robots	(8)	CO5

OR

5b)	Describe the role of IMUs in balancing and navigation of robots.	(8)	CO5
5c)	Explain how thermal cameras are used in robotic inspection systems.	(8)	CO5

OR

5d)	Describe how proximity sensors assist in obstacle avoidance for mobile robots.	(8)	CO5

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