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:Robot Programming	Course Code:ROB223012
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 02 page(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)	What is a coordinate system? various coordinate systems commonly used in robots.	(6)	CO1
Question No. 2			
2a)	What are the various commands used for welding operations in VAL programming? Provide an example of a basic welding program and an advanced welding program using loops.	(6)	CO2, CO3
Question No. 3			
3a)	Explain the concept of a pick and place operation using an industrial robot in automatic mode. What are the basic steps to program it? Also, write the complete RAPID program for the automatic pick and place operation.	(8)	CO2, CO3
	OR		
3b)	What is a subroutine in RAPID programming? Explain its basic structure and advantages. Write a simple pick and place task using a subroutine.	(8)	CO2, CO3
3c)	Briefly explain the Move Master Command Language, its characteristics, features, basic syntax, and commands. Provide a simple example code in it for joint movement.	(8)	CO2, CO3
	OR		
3d)	Elaborate all the basic commands in RAPID Programming language with examples for each.	(8)	CO2, CO3
Question No. 4			
4a)	What is program control in KAREL programming? Explain the different control structures used in KAREL with suitable examples.	(8)	CO3
	OR		
4b)	What are the different types of operators in KAREL? Give any two examples of their usage in a KAREL program.	(8)	CO3

4c)	What are the basic commands in KAREL programming? Briefly explain the basic structure of a KAREL program.	(8)	CO3

OR

4d)	What common industry problems are addressed using KAREL, and why is KAREL considered suitable for solving such problems?	(8)	CO3

Question No. 5

5a)	Explain the concept of robot cycle time analysis. Discuss its key components, methods used to evaluate it, and the factors that affect cycle time.	(8)	CO3, CO4

OR

5b)	What is a process chart in robotics? Explain its types, uses, and benefits with the help of a pick-and-place example.	(8)	CO3, CO4
5c)	What is collision detection in robotics? Mention its purpose, types, avoidance techniques, and benefits	(8)	CO3, CO4

OR

5d)	What is robot economics? State its objectives, key cost components, benefits of robot implementation, and hidden or indirect costs involved.	(8)	CO3, CO4

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