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:V
Class:TY	Program:B.Tech
Branch Code:ROB	Pattern:2023
Name of Course:Robot Path Planning	Course Code:2312302
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)	What are the different aspects of motion planning in robot path planning?	(6)	CO1
Question No. 2			
2a)	How separating line and supporting line used in Reduced visibility graph?	(6)	CO2
Question No. 3			
3a)	Define "cell" in Exact cell decomposition and how does it relate to the concept of "Adjacent cells"	(8)	CO3
	OR		
3b)	Explain different types of events that can occur in Trapezoidal Cell Decomposition?	(8)	CO3
3c)	Describe Concentric circle pattern with diagram in coverage pattern	(8)	CO3
	OR		
3d)	What is the role of 4 point and 8 point connectivity in brushfire algorithm?	(8)	CO3
Question No. 4			
4a)	Describe Potential function with diagram.	(8)	CO4
	OR		
4b)	Explain the Repulsive Potential Function with mathematical representation**.**	(8)	CO4
4c)	Explain the strategies for addressing local minima in potential function	(8)	CO4
	OR		
4d)	Explain Depth First Search Algorithm with suitable example and diagram.	(8)	CO4
Question No. 5			
5a)	Describe Problem definition of multi robot path planning and its optimization criteria.	(8)	CO5
	OR		

5b)	Explain in detail the Taxonomy of multi robot path planning	(8)	CO5
5c)	Explain the concept of Potential Deadlock and Completeness with diagram in multi robot path planning.	(8)	CO5

OR

5d)	Write down the advantages and disadvantages of multi robot system	(8)	CO5

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