



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-II Summer 2025	
Exam Seat No.:	
Academic Year: 2024-2025	Semester: IV
Class: SY	Program: B.Tech
Branch Code: ROB	Pattern: 2023
Name of Course: Computer Graphics for Robotics	Course Code: 2312212
Max. Marks: 30	Duration: 1.15 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 1 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 column indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Marks CO

Question No. 1

- 1 a) Determine if the line through the points (3, 1, 8) and (2, 4, -1) is parallel, orthogonal or neither to the line through points (5, 4, 5) and (2, 6, 6) (7) CO1

Question No. 2

- 2 a) Determine mathematically the angle formed by two intersecting lines AB and BC. The co-ordinates are A (1, 4), B (6, 10), and C (9, 2). (8) CO1

OR

- 2 b) A plane is determined by a normal vector $4i+5j-2k$ and point (8, -3, 4). Find the distance from point (6, 2, 8) to the plane. (8) CO1

Question No. 3

- 3 a) Show that transpose of a rotation matrix is its inverse. (7) CO2

Question No. 4

- 4 a) A rectangle A(5, 2), B(8, 6), C(4, 10), D (1, 7) is scaled uniformly by factor 2 and then rotated through 65° rotation about point B. Obtain the transformed position of a rectangle. (8) CO2

OR

- 4 b) For a cylindrical robot, following transformations are applied: (8) CO2

- Swing (θ) = 40°
- Stroke (t_y) = 4 Units
- Reach (t_x) = 2 Units.

If the end effector is originally at (5, 3, 0), determine its transformed position.

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