Assignment 2

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2021-02-07, 23:59 IST.

1) A SCARA robot structure consists of:
   - 4 DOF: Prismatic,Prismatic,Revolute,Prismatic
   - 4 DOF: Revolute,Prismatic,Revolute,Revolute
   - 5 DOF: Revolute,Prismatic,Revolute,Prismatic
   - 5 DOF: Revolute,Prismatic,Revolute,Prismatic,Prismatic
   
   No, the answer is incorrect.
   Accepted Answers:
   4 DOF: Prismatic,Revolute,Prismatic

2) Position of a point in space is represented by three position coordinates whereas the orientation of a rigid body is expressed by a:
   - (3 x 3) Orthogonal Matrix
   - (3 x 3) Orthonormal Matrix
   - (3 x 3) Homogeneous transformation matrix
   - (3 x 2) Identity matrix
   
   No, the answer is incorrect.
   Accepted Answers:
   (3 x 3) Orthonormal Matrix

3) The elements of each column of a rotation matrix is:
   - 1
   - 0.9
   - 0.866
   - 1.396
   
   No, the answer is incorrect.
   Accepted Answers:
   1

4) The determinant of a rotation matrix is:
   - -1
   - 0.5
   - 0.9
   - 1
   
   No, the answer is incorrect.
   Accepted Answers:
   0.5

5) The inverse of the rotation matrix, R
   - Transpose of the cofactor matrix of R
   - Transpose of R
   - Cofactor matrix of R
   - Transpose of \( R^T \)
   
   No, the answer is incorrect.
   Accepted Answers:
   Transpose of \( R^T \)

6) A frame 'W' is rotated by 90 degree about X-axis of A. If the coordinate of a point P in frame B has the coordinate (1,1,1), what is its coordinate in frame A?

   \[-1,2,3,4,5,6,7,8,9,10,11,12\]

   No, the answer is incorrect.
   Accepted Answers:
   (1,2,3,4,5,6,7,8,9,10,11,12)

7) A frame 'W' is rotated by 30 degree about Z-axis of A. It is again rotated by 90 degree about Y-axis of A. The combined rotation matrix is given by:
   
   \[
   R = \begin{bmatrix}
   R_{x,30} & R_{y,90} & R_{z,30} \\
   R_{y,90} & R_{y,90} & R_{y,90} \\
   R_{z,30} & R_{z,30} & R_{z,30}
   \end{bmatrix}
   \]
   
   No, the answer is incorrect.
   Accepted Answers:
   Transpose of J

8) A frame 'W' is rotated by 90 degree about Z-axis of A and then translated by [2,2,2] units in x,y,z direction of A. If coordinate of a point P in frame A is \((1,1,1,1)\) then coordinate in frame A:

   \[-1,2,3,4,5,6,7,8,9,10,11,12\]

   No, the answer is incorrect.
   Accepted Answers:
   (1,1,1,1)

9) The scale parameter of a homogeneous transformation matrix is:

   No, the answer is incorrect.
   Accepted Answers:
   1

10) The perspective part of the homogeneous transformation matrix is:

   No, the answer is incorrect.
   Accepted Answers:
   0,0,0