Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2
- ● Lecture 03 - Spatial transformations
- ● Lecture 04 - Homogenous Transformtions
- ● Lecture 04.1 - Practice Problems with MATLAB in Rotation matrices
- ● Week 2 - Lecture Notes
- ○ Quiz : Assignment 2
- ● Feedback for Week 2
- ● Assignment 2 Solutions

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

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Assignment 2

The due date for submitting this assignment has passed.

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

As per our records you have not submitted this assignment.

Assignment 2

1) A SCARA Robot structure consists of: **1 point**
- ○ 4 DoF - Prismatic,Revolute,Revolute,Revolute
- ○ 4 DoF - Revolute,Revolute,Prismatic,Revolute
- ○ 4 DoF - Revolute,Prismatic,Revolute,Revolute
- ○ 5 DoF - Revolute,Revolute,Revolute,Prismatic,Revolute

No, the answer is incorrect.
Score: 0
Accepted Answers:
4 DoF - Revolute,Revolute,Prismatic,Revolute

2) Position of a point in space is represented by three position coordinates whereas the orientation of a rigid body is expressed by a   **1 point**
- ○ (3 X 3) Skew symmetric matrix
- ○ (3 X 3) Orthonormal Matrix
- ○ (4 X 4) Homogeneous transformation matrix
- ○ (3 X 3) Identity matrix

No, the answer is incorrect.
Score: 0
Accepted Answers:
(3 X 3) Orthonormal Matrix

3) The modulus of each columns of the rotation matrix is   **1 point**
- ○ 1
- ○ 0.5
- ○ 0.866
- ○ 1.366

No, the answer is incorrect.
Score: 0
Accepted Answers:
1

4) The determinant of a rotation matrix is   **1 point**
- ○ -1
- ○ 0.5
- ○ -0.5
- ○ 1

No, the answer is incorrect.
Score: 0
Accepted Answers:
1

5) The inverse of the Rotation matrix 'R'is   **1 point**
- ○ Transpose of the cofactor matrix of R
- ○ Transpose of R
- ○ Cofactor matrix of R
- ○ Transpose of R^T

No, the answer is incorrect.
Score: 0
Accepted Answers:
Transpose of R

6) A frame 'B' is rotated by 60 degree about Z-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 point**
- ○ (-0.366,1.366,1)
- ○ (1.366,-0.366,1)
- ○ (-1.366,0.366,1)
- ○ (0.366,-1.366,1)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(-0.366,1.366,1)

7) A frame 'B' is rotated by 30 degree about Z-axis of A. It is again rotated by 60 degree about X-axis of A.The combined rotation matrix is given by   **1 point**
- ○ $R_{(X,60)}R_{(Z,30)}$
- ○ $R_{(Z,30)}R_{(X,60)}$
- ○ $R_{(Y,30)}R_{(Z,30)}$
- ○ $R_{(Z,30)}R_{(Y,30)}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$R_{(X,60)}R_{(Z,30)}$

8) A frame 'B' is rotated by 60 degree about Z-axis of A and then translated by (2,2,2) units in x,y,z direction of A. If coordinate of point P in frame B is (1,1,1) find its coordinate in frame A.   **1 point**
- ○ (1.634,3.366,3)
- ○ (3.366,1.634,3)
- ○ (3,1.634,3.366)
- ○ (3,3.366,1.634)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(1.634,3.366,3)

9) The scale parameter of a homogeneous transformation matrix is   **1 point**
- ○ 0
- ○ No scale
- ○ 2
- ○ 1

No, the answer is incorrect.
Score: 0
Accepted Answers:
1

10) The perspective part of the homogeneous transformation matrix is   **1 point**
- ○ 1 1 1
- ○ 0 0 0 1
- ○ 0 0 0
- ○ 1 1 1 0

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