

MCE4101 Introduction to Robotics
Quiz1 (5%) –SET 3 (ID end with 5,6)

Name.....**ID**.....

Date: 15 July 2021 (9.15-10.00)

Note:

1. *OPEN BOOK.*

2. *There are 2 questions.*

3. *50 Marks equivalent to 5%.*

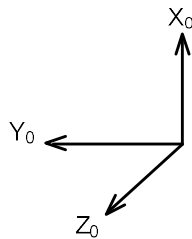
1. (25 Marks). The original frame is given. The following transformation steps for current frames are

- i. Rotate -90° in the current y axis then
- ii. Translate 2 in the current x axis then
- iii. Rotate 90° in the current x axis then
- iv. Rotate 90° in the current z axis then
- v. Translate -2 in the current z axis

a. (10) List down the all the transformation steps. Find the T_5^0 transformation matrix values.

b. (5) If a point is fixed on the z axis at (0,0,1), obtain the coordinate P_5 with reference to original frame.

c. (10) Plot all the transformation frames and mark P_5 location with reference to origin frame.



Ans:

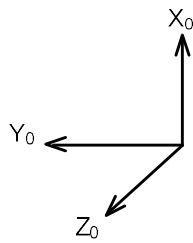
2. (25 Marks). The original frame is given. The following transformation steps for fixed frames are

- i. Rotate -90° in the fixed y axis then
- ii. Translate 2 in the fixed x axis then
- iii. Rotate 90° in the fixed x axis then
- iv. Rotate 90° in the fixed z axis then
- v. Translate -2 in the fixed z axis

a. (10) List down the all the transformation steps. Find the T_5^0 transformation matrix values.

b. (5) If a point is fixed on the z axis at (0,0,1), obtain the coordinate P_5 with reference to original frame.

c. (10) Plot all the transformation frames and mark P_5 location with reference to origin frame.



Ans:

