

**MCE4101 Introduction to Robotics**  
**Quiz1 (5%) –SET 4**

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

**Date: 9 July 2020 (9.20-10.20)**

*Note:*

1. *OPEN BOOK.*

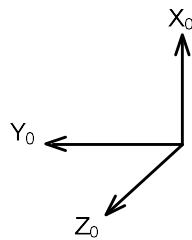
2. *25 Marks equivalent to 5%.*

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

- i. Rotate  $90^\circ$  in the current y axis then
- ii. Translate -2 in the current z axis then
- iii. Rotate  $-90^\circ$  in the current y axis then
- iv. Translate 2 in the current x axis then

- a. (10) Find the  $T_4^0$  transformation matrix.
- b. (5) If a point is fixed on the z axis at (0,0,1), obtain the coordinate  $P_4$  with reference to origin.
- c. (10) Plot all the transformation frames and mark  $P_4$  location with reference to origin



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

- i. Rotate  $90^\circ$  in the fixed y axis then
- ii. Translate -2 in the fixed z axis then
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- a. (10) Find the  $T_4^0$  transformation matrix.
- b. (5) If a point is fixed on the z axis at (0,0,1), obtain the coordinate  $P_4$  with reference to origin.
- c. (10) Plot all the transformation frames and mark  $P_4$  location with reference to origin

