

**MCE4101 Introduction to Robotics**  
**Quiz2 (5%) –SET 4 (ID end with 2, 6)**

Name.....ID.....

Date: 9 Sept 2021 (9.15-10.00)

Note:

1. OPEN BOOK.

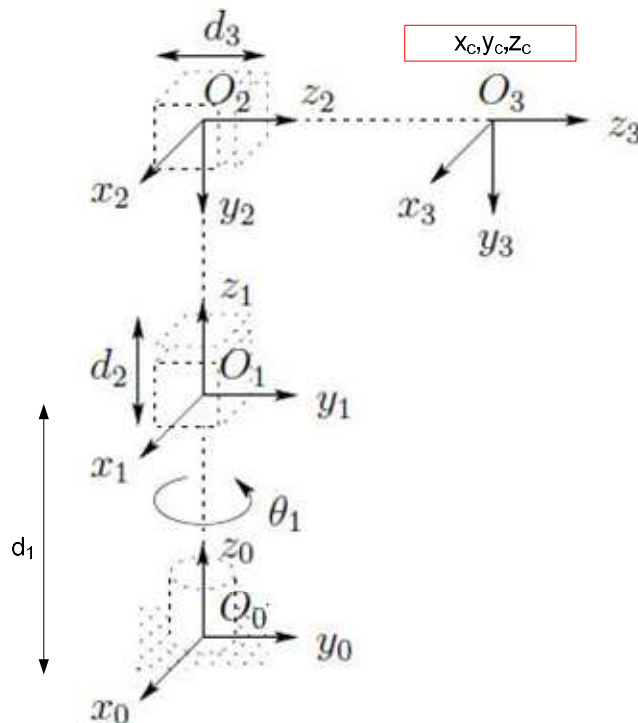
2. There are 2 questions.

3. 50 Marks equivalent to 5%.

1. (20 Marks)

a) (15 Marks) Given  $P(x_c, y_c, z_c)$ , determine variable's equation for  $\theta_1^*, d_2^*, d_3^*$  in term of  $x_c, y_c, z_c$  and  $d_1$  for RPP robot by **geometrical** method.

b) (5 Marks) From a), Given  $d_1 = 2.25$  and  $P(1.5, 1.25, 3)$ , obtained 1 set of  $\theta_1^*, d_2^*, d_3^*$ .

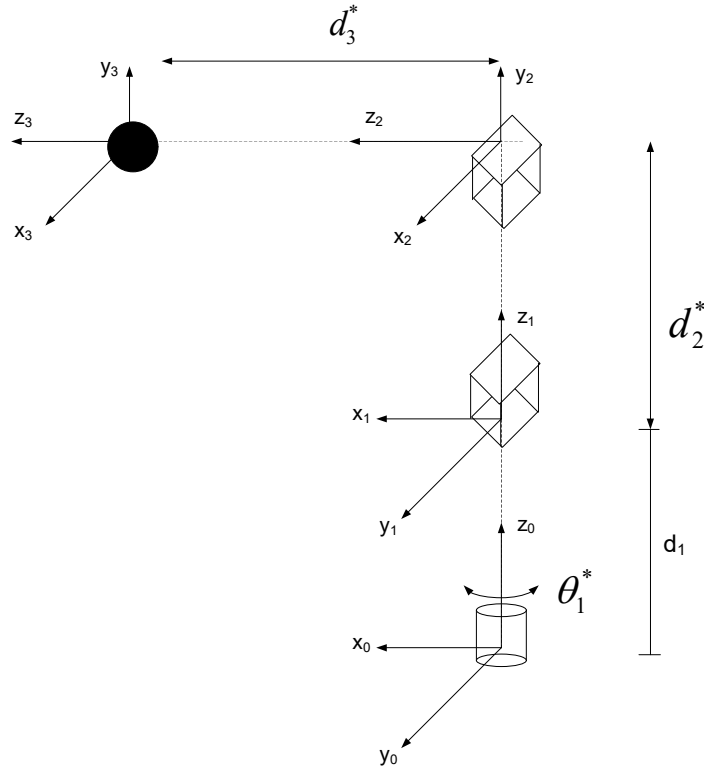


**Ans:**



2. (30 Marks). The 3 links RPP robot is shown.

- (5 Marks) Obtain DH table and the transformation matrix equation  $T_3^0$ . Where  $d_1$  is link offset. Given  $d_1 = 2.5$ .
- (15 Marks) Determine with analytic method for possible solution for end point location  $P_{end} = [1.13 \quad 1.95 \quad 3.75]$ . Show your working steps.
- (10 Marks) Check your answer b), show your checked answer and your working steps.



**Ans:**

