ASSUMPTION UNIVERSITY

VINCENT MARY SCHOOL OF ENGINEERING

MIDTERM EXAMINATION 1 / 2020 (Part 2 – SET7)

SUBJECT : **MCE4101-Introduction to Robotics**

LECTURER : **Asst. Prof. Dr. Narong Aphiratsakun (narongphr@au.edu)**

DATE : **30 July 2020**

TIME : **10.10-11.00**

NAME ……	**SURNAME ……**	**ID.NO. ……**	**SEC……**

Make sure you have all the questions.

- Total examination paper: **1** question, **1** page (not including cover page).

Instructions:

1. This examination is worth a total of **60** points. This examination will contribute to **13% of your final grade**.
2. **Open books Examination**.
3. Answer in the provided booklet.
4. **Any** calculator can be used.
5. The University's examination regulations are on the reverse page. Students are expected to read and strictly observe them while the examination is in progress. Failure to do so would subject students to the terms of punishments.

This is to inform that

- Students are NOT allowed to use Smart Watches in examinations. Should they be brought into examination rooms, they are required to be placed on the floor under students' desk or chair.
- Violators will be subjected to the terms of punishment for violating examination regulations and/or cheating in the examination.

Other pertinent University's examination regulations are on the reverse page.
Students are expected to read and strictly observe them while the examination is in progress.
Failure to do so would subject students to the terms of punishments for violating examination regulations and/or cheating in the examination.

NAME …… SURNAME …… ID.NO. …… SEC……

3. (60 Marks). The 3 links RPP robot is shown.
   a) (30 Marks) Obtain DH table and the transformation matrix **equation** T^0_{end}. Where d_1 and d_3 are links' offset. Given $d_1 = 2$ and $d_3 = 1.5$.
   b) (10 Marks) Obtain the transformation matrix **value** T^0_{end} when $\theta_1^* = 0°, d_2^* = 3, d_4^* = 1.5$.
   c) (5 Marks) Obtain the P_{end} when $\theta_1^* = 0°, d_2^* = 3, d_4^* = 1.5$.
   d) (10 Marks) Obtain the transformation matrix **value** T^0_{end} when $\theta_1^* = 90°, d_2^* = 3, d_4^* = 1.5$.
   e) (5 Marks) Obtain the P_{end} when $\theta_1^* = 90°, d_2^* = 3, d_4^* = 1.5$.

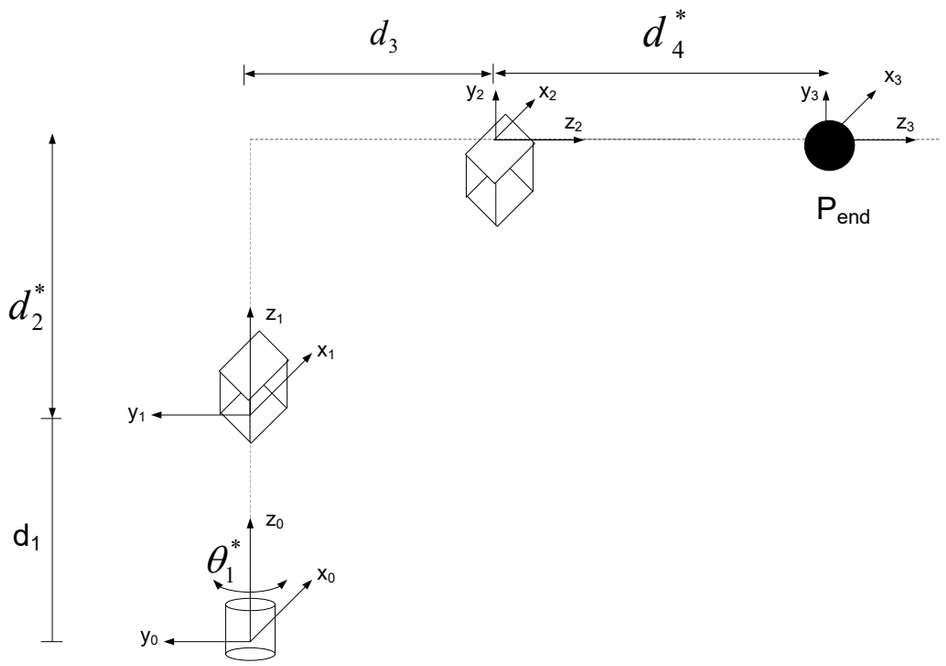

Figure 3.1: RPP Robot for Q3.

Total 60 Marks

%%%%%%%%%%%%%%%%%%Enjoy Robotics, End of Questions3%%%%%%%%%%%%%%%%%%