Q1 n 2 theory question. Each 10 marks.

Q1

Compare 2 type of kinematics. Difference between forward n inverse kinematics

Need sketch/draw types of work envelope, Cartesian, articulated.

Q2, put these in chatgpt

Mass production to household applications. Humanoid robot need inverse kinematics. How humanoid robot can help with household application

Next token predictor, it's for large action model.... humanoid robot with large action model.

Tutorial 1 $3(5-1-5)+5=2$

Tutorial 2 Q2 $= q_{unit} = \begin{bmatrix} 0.3 \\ q_2 \\ 0.4 \\ 0 \end{bmatrix}$

$p = 8$

$r_{unit} = \begin{bmatrix} r_1 \\ 0.5 \\ 0.4 \\ 0 \end{bmatrix}$

$\sqrt{0.09 + q^2 + 0.16} = 1$

$q^2 = 0.75$

$q = 0.87$

$$\sqrt{r^2 + 0.41} = 1$$

$$r^2 = 0.59$$

$$r = 0.77$$

$$\begin{bmatrix} 0.77 \\ 0.87 \\ 0.4 \\ 0 \end{bmatrix} \times 8$$

6.16

6.96

3.2

T2 Q5

T2 Q9

P(1,2,3)

$F_{new} = Rot(y, 60) \times Rot(z, 30°) \times P(1,2,3)$

T3 Q4

Q4 — Lecture 4, Example 2.19

2.16

T4Q1

LECTURE 5, EXAMPLE 5.1, 5.2