ME370: ADAMS LAB

Department of Mechanical Engineering,
IIT Bombay

Session 6 Report

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Roll Number: 210100166

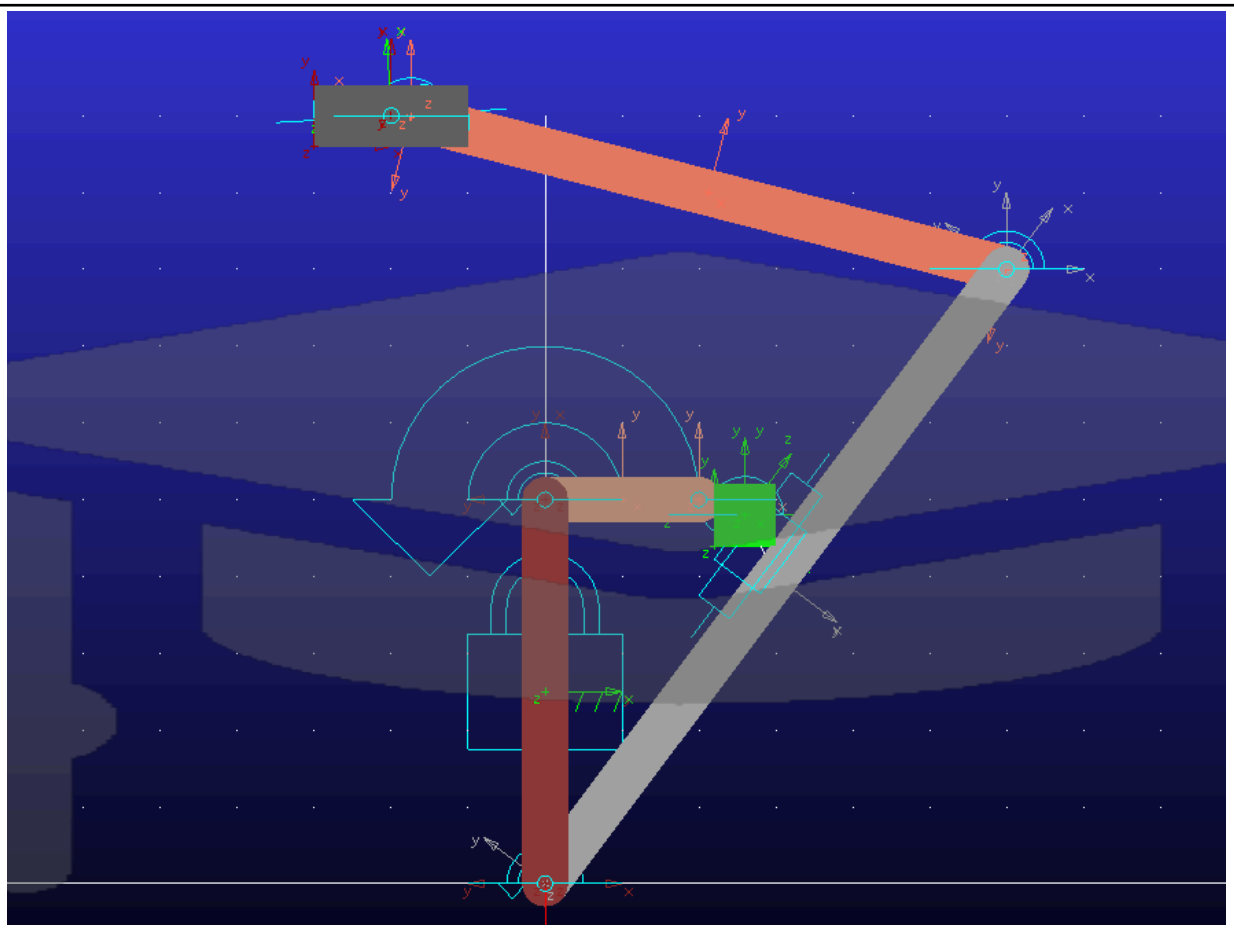
Date: March 13,2024

Given Information

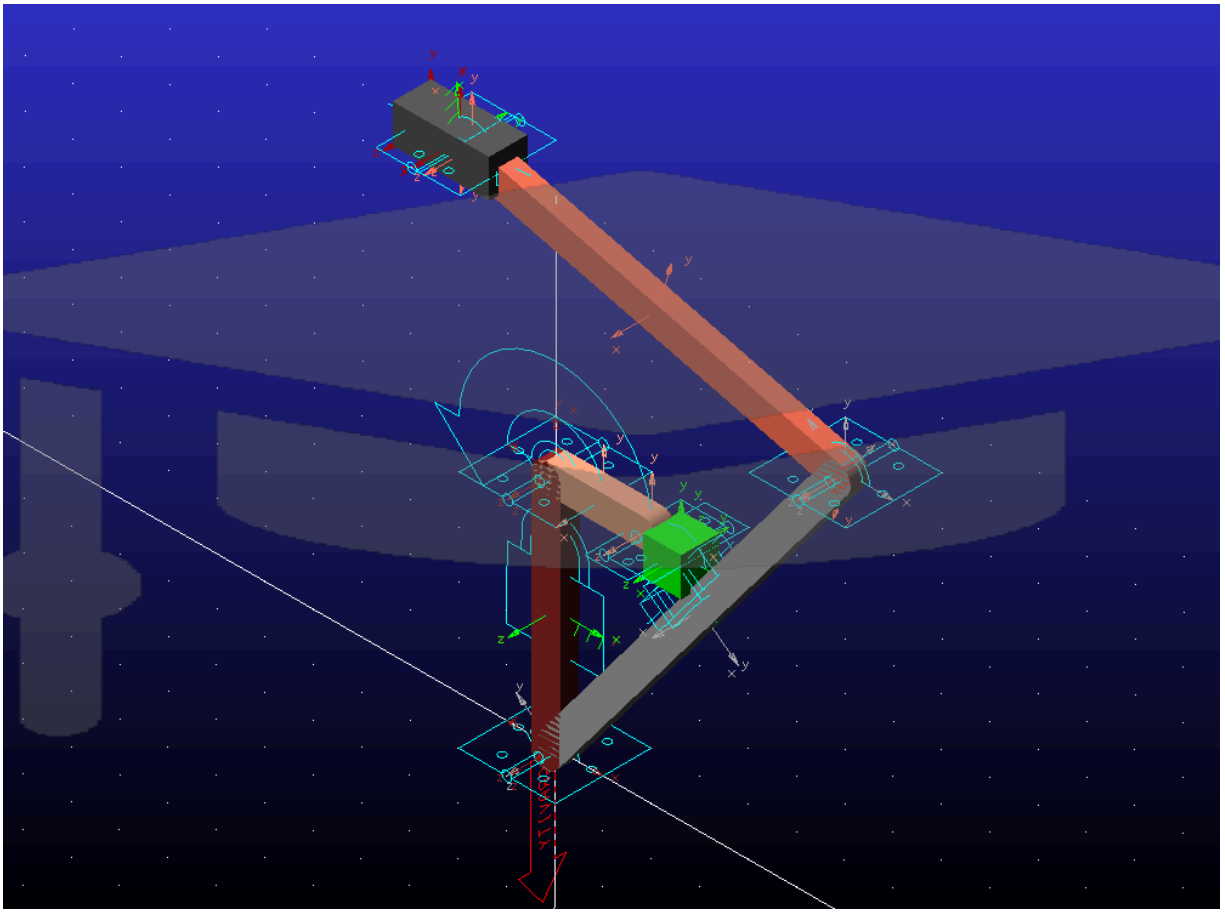
	Link Lengths (mm) and Information					
Roll Number	AB	CD	AC	DE	Slider E	Slider B
210100166	100	500	250	400	500 above C	Along CD
Link Masses	1.203	2.981	-	1.364	7.122	1.564

Shaper Mechanism

1. Torque Variation in the absence of Force

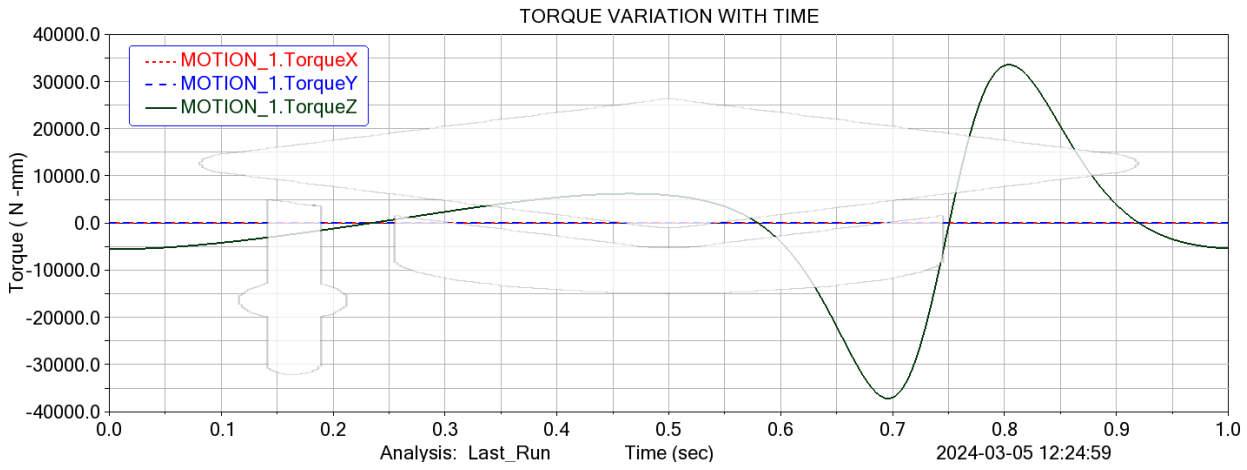


Front View

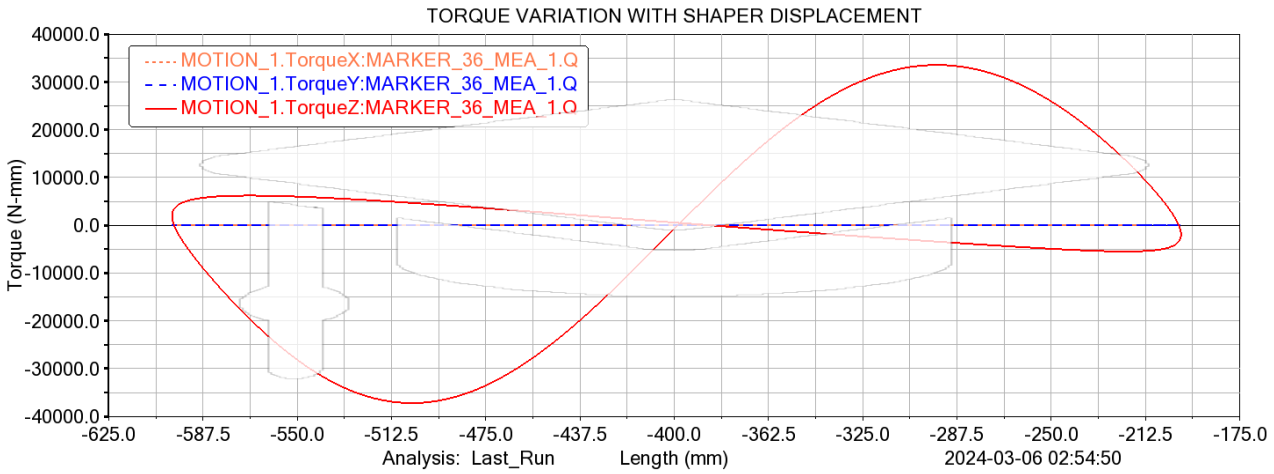


Isometric View

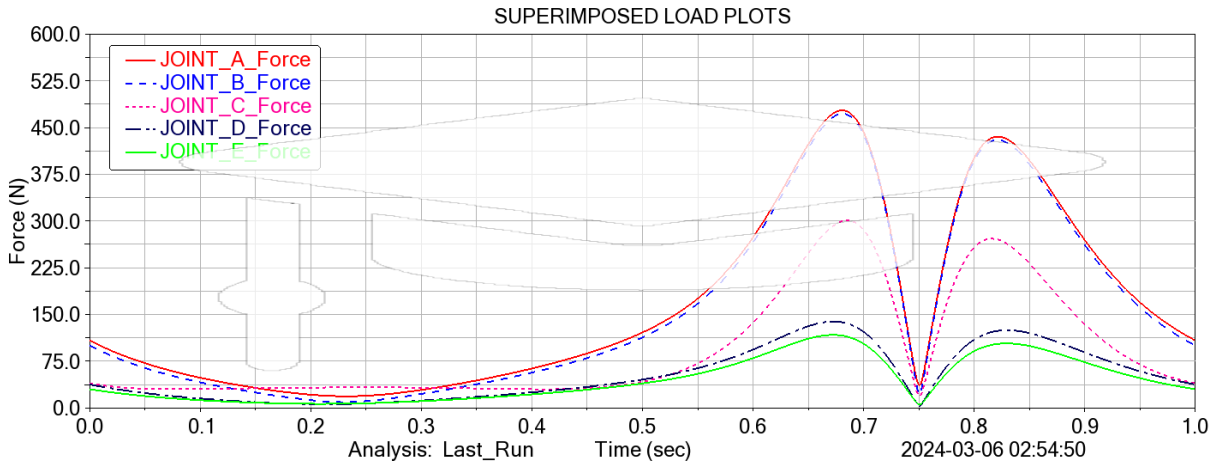
Torque to be applied to rotate the crank as a function of time



Torque to be applied to rotate the crank as a function of displacement of shaper



Superimposed plots of loads seen at each joint

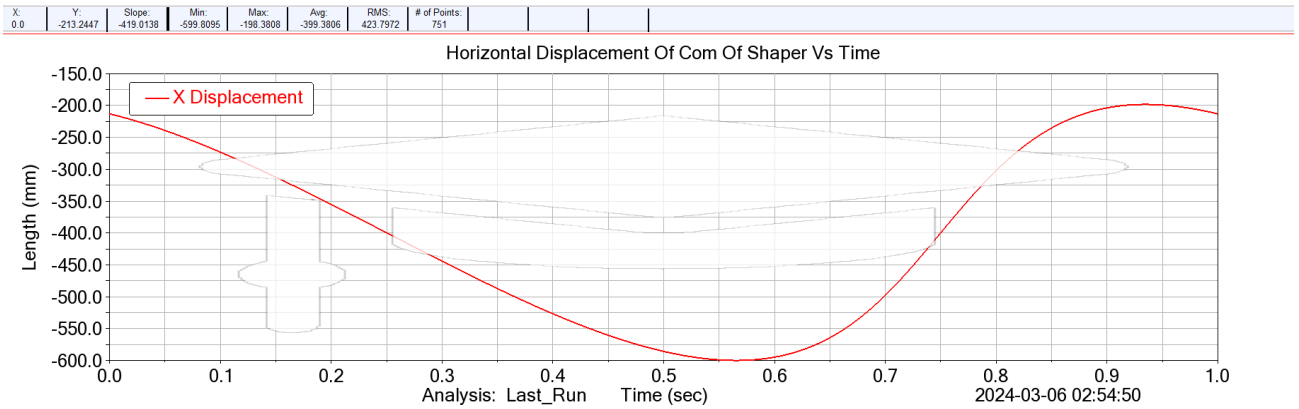


OUTPUTS:

- Revolute joint A experiences maximum load.
- Force magnitude order: A>B>C>D>E.

2. Torque Variation in the Presence of Force

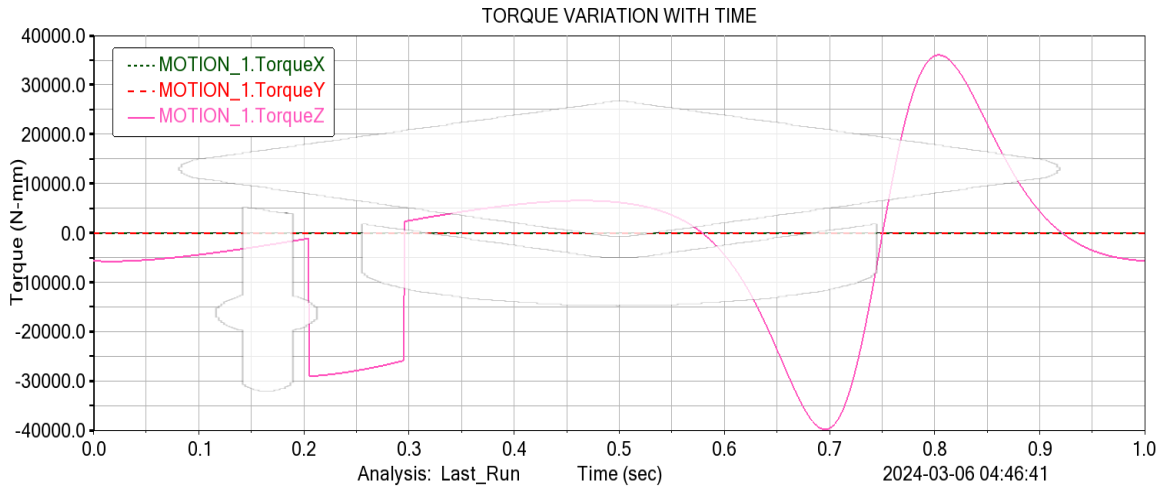
Horizontal Displacement Of Com Of Shaper



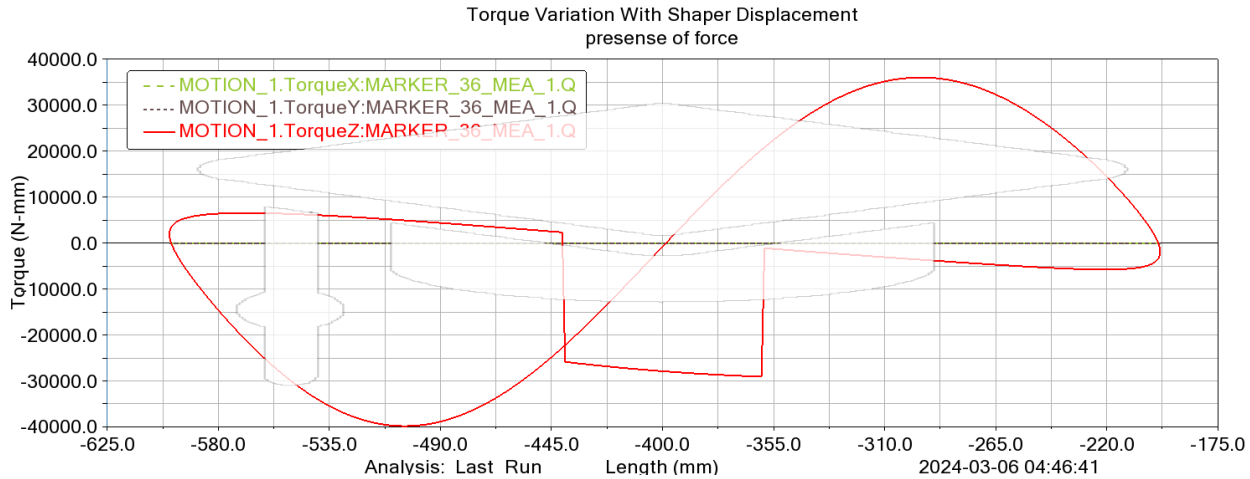
- **Calcultaions:**

From Graph	Maximum Displacement	− 198.3808 mm
	Minimum Displacement	−599.8095 mm
	Average (Centre) Displacement	−399.3806 mm
Stroke Length	$\lvert Maximum - Minimum \rvert$	401.4287 mm
Workpiece Length	0.2 × (Stroke Length)	80.28574 mm
Range in which cutting force acts	-399.3806 ± 40.14287	[-359.23773, -439.52347]
Time during which cutting force acts: (0.205,0.295)		
Force Function	if(time-0.205: 0,0, if(time-0.295: 200.0,0,0)) [+200 indicates that cutting force acts towards the right]	

Torque to be applied to rotate the crank as a function of time



Torque to be applied to rotate the crank as a function of displacement of shaper



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