

# **ME370: ADAMS LAB**

**Department of Mechanical Engineering,  
IIT Bombay**

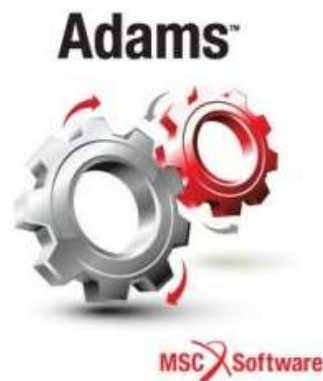


## **Session 6 Report**

**Group / Section: A8**

**Name: Ameya Halarakar**

**Roll Number: 200020023**

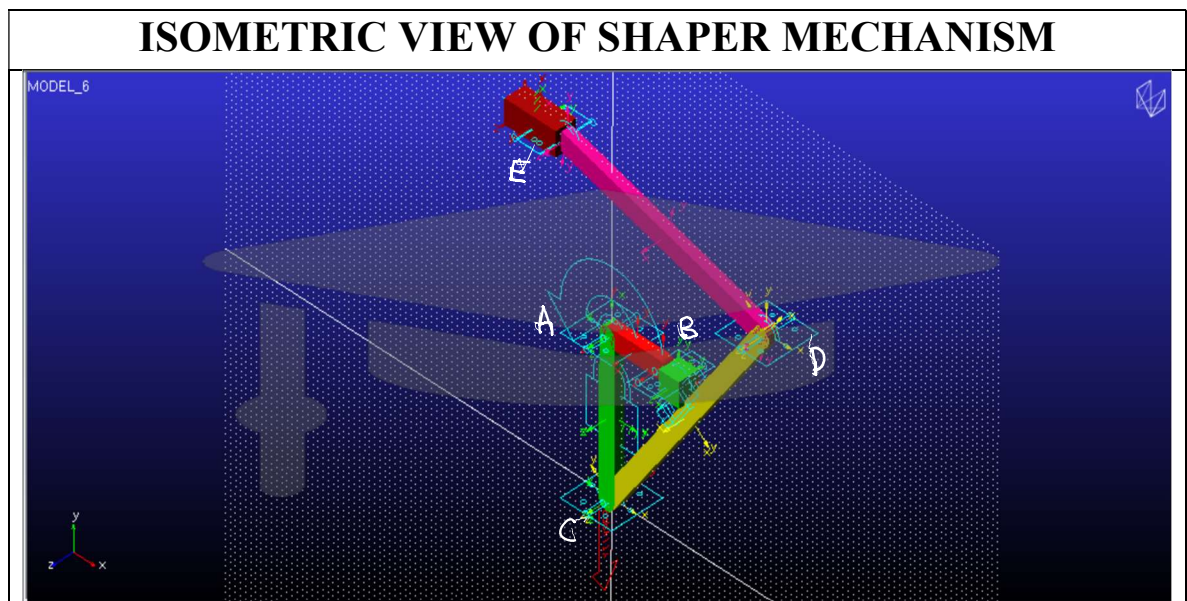


**Date: March 10,2023**

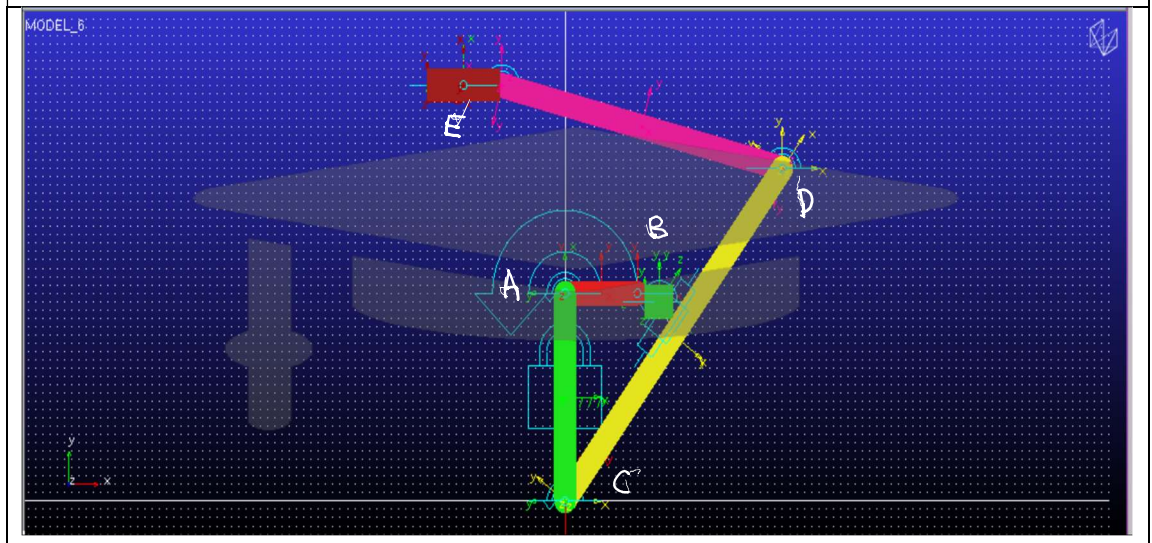
## Given Information

Roll Number	Link Lengths (mm) and Information					
	AB	CD	AC	DE	Slider E	Slider B
200020023	100	500	250	400	500 above C	Along CD
Link Masses	0.12825	5.026	-	2.0137	61.411	2.397

## Question 1 (Shaper Mechanism)

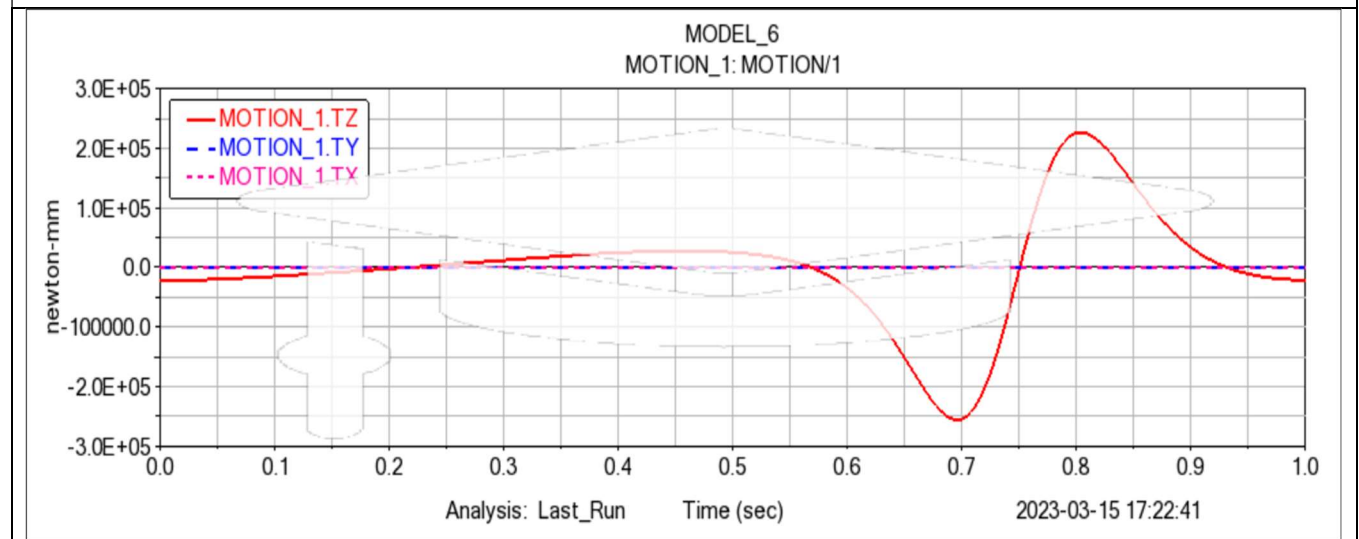


## FRONT VIEW OF SHAPER MECHANISM

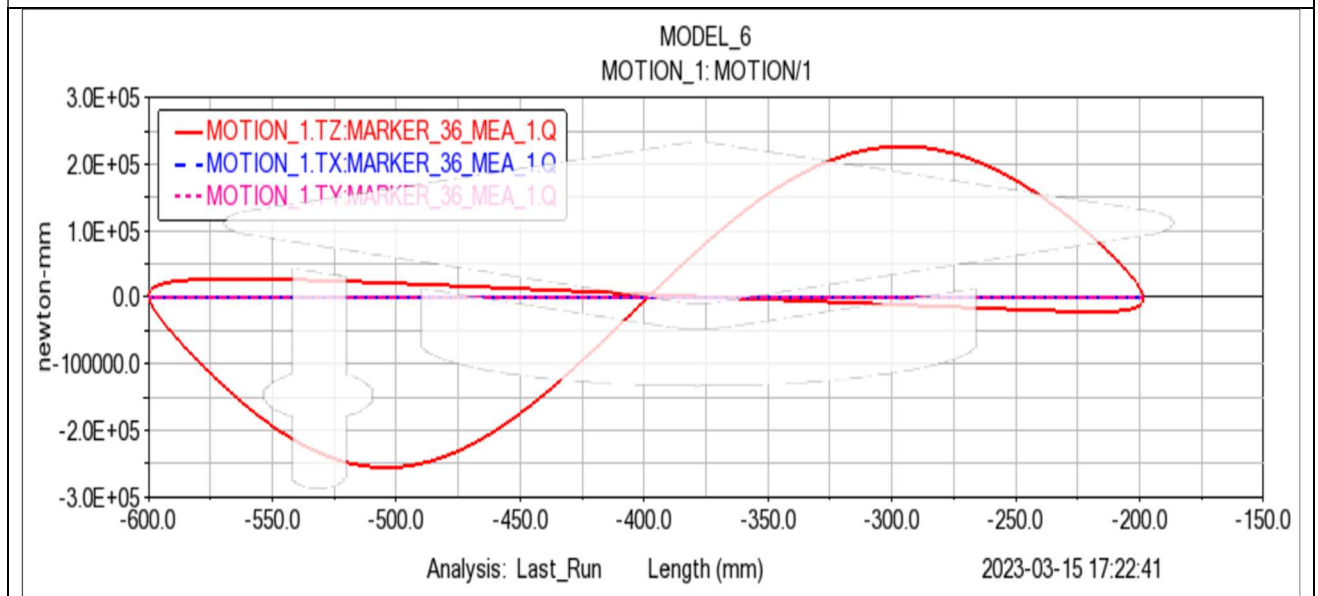


## Question 2 (Torque Variation in absence of Force)

### TORQUE VARIATION WITH TIME

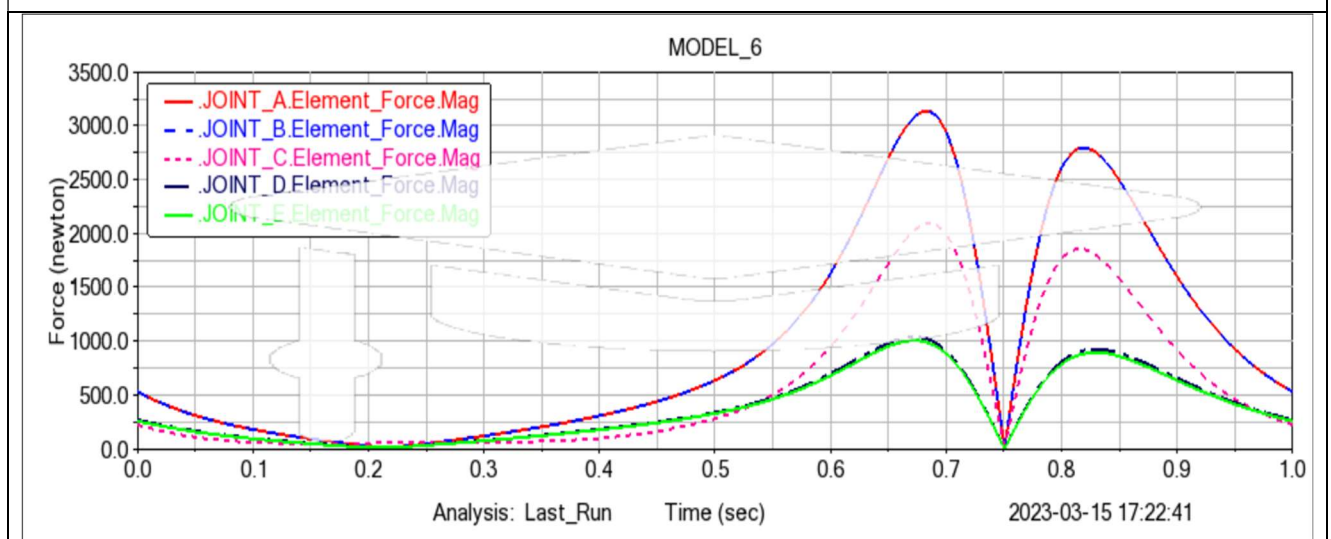


## TORQUE VARIATION WITH SHAPER DISPLACEMENT



## Question 3 (Cumulative Load Plots at each Joint)

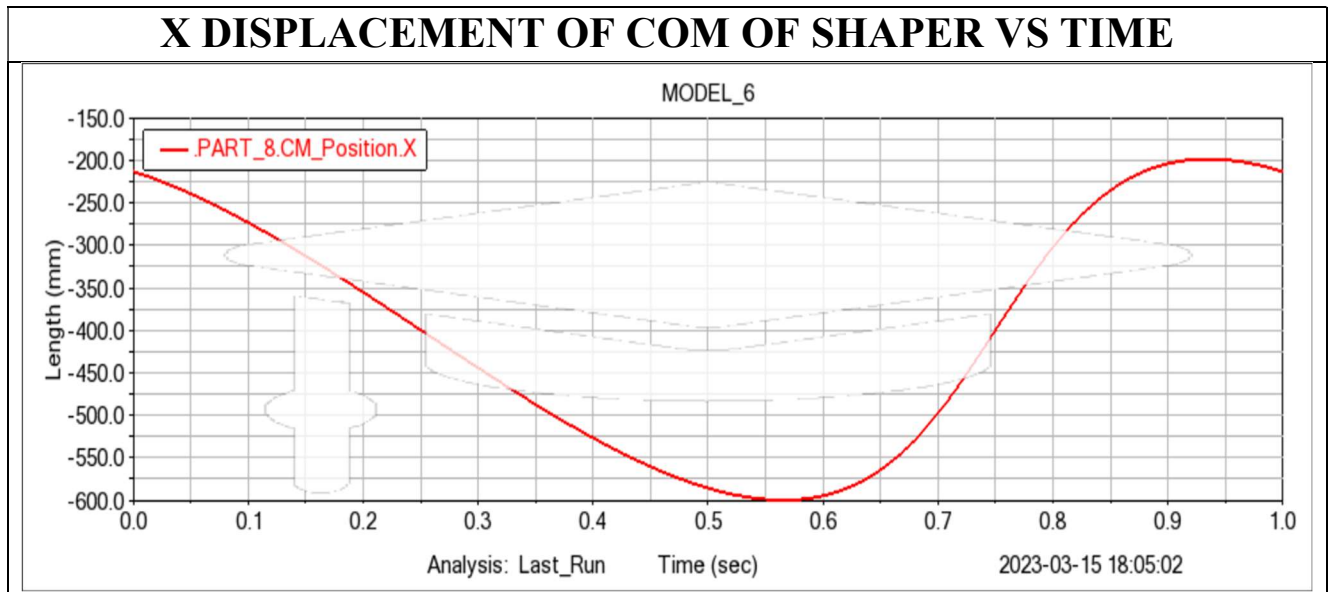
### SUPERIMPOSED LOAD PLOTS



## OUTPUTS:

- The revolute joint A experiences the maximum load.
- The magnitude of forces at different joints is according to the order:  $A > B > C > D > E$ .

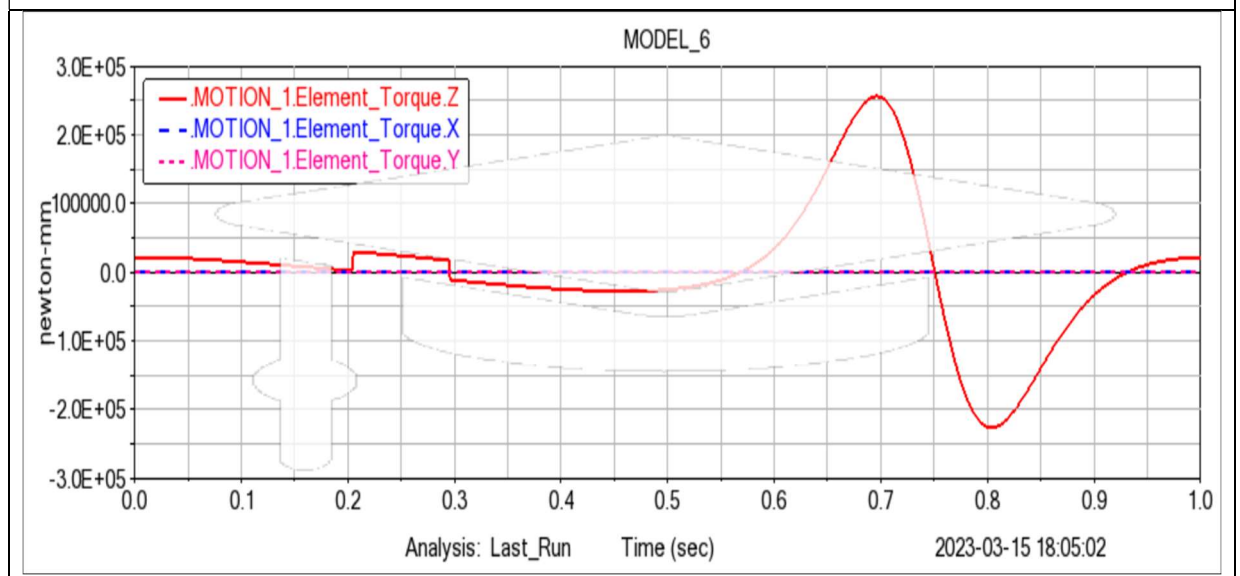
## Question 4 (Torque Variation in presence of Force)



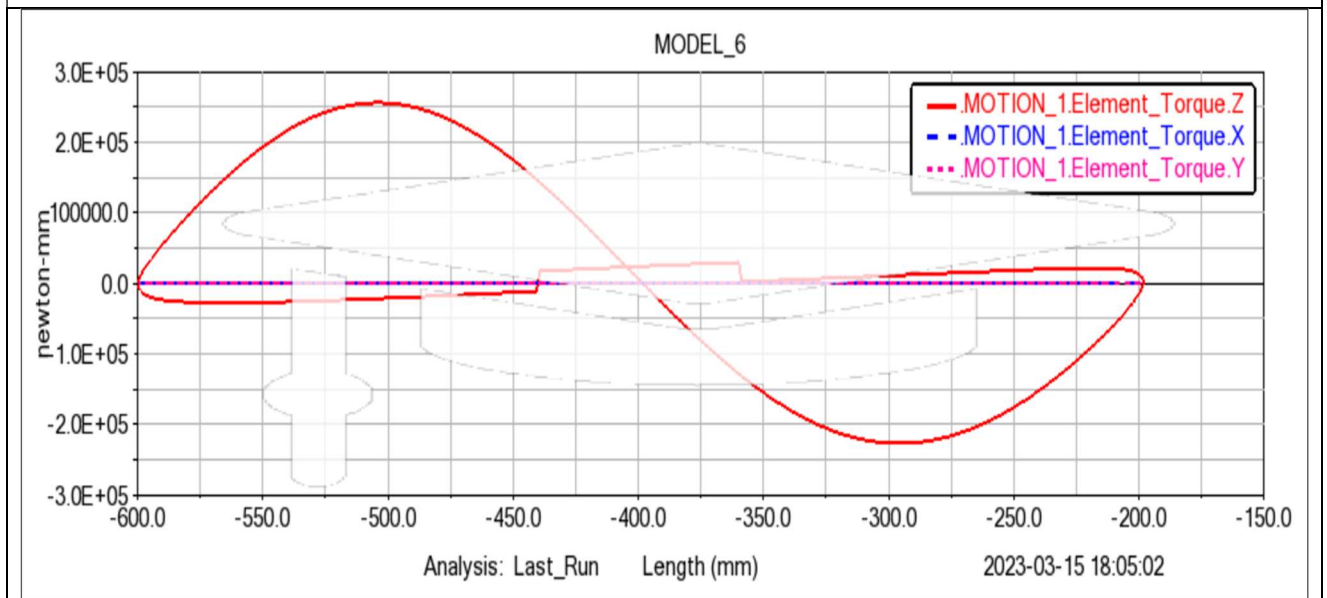
Calculations	
Maximum Displacement = $-198.3808$ mm	Obtained from above graph
Minimum Displacement = $-599.8095$ mm	
Average (Centre) Displacement = $-399.3806$ mm	
Stroke Length =  Maximum – Minimum  = $401.4287$ mm	
Workpiece Length = $0.2 \times (\text{Stroke Length}) = 80.28574$ mm	
Range in which cutting force acts: $(-399.3806 \pm 40.14287) = (-359.23773, -439.52347)$	
Time during which cutting force acts: (0.205,0.295)	Obtained from above graph
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]	Using Nested IF Loops



## TORQUE VARIATION WITH TIME



## TORQUE VARIATION WITH SHAPER DISPLACEMENT



—X—X—X—X—X—X—X—X—**END**—X—X—X—X—X—X—X—X—