ME370: ADAMS LAB

Department of Mechanical Engineering, IIT Bombay

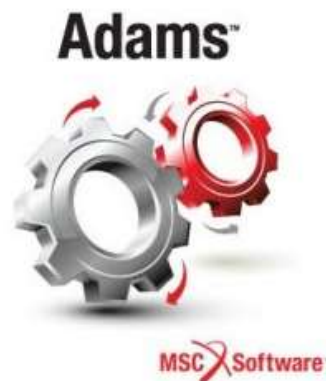**Session 5 Report**

Group / Section: A8
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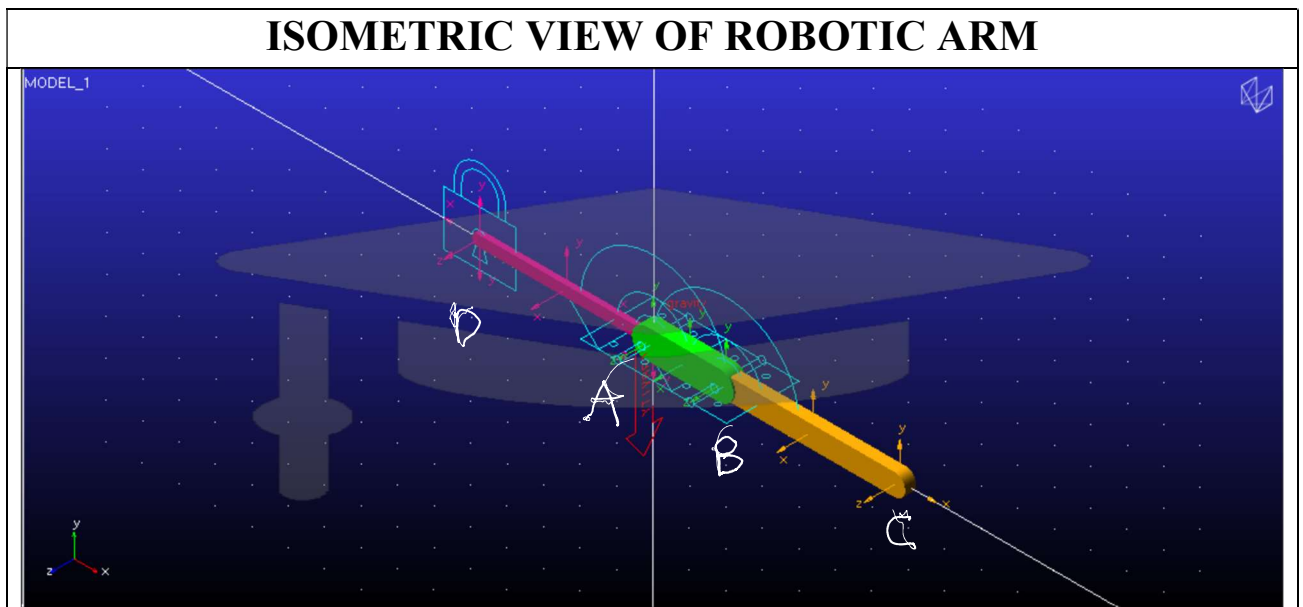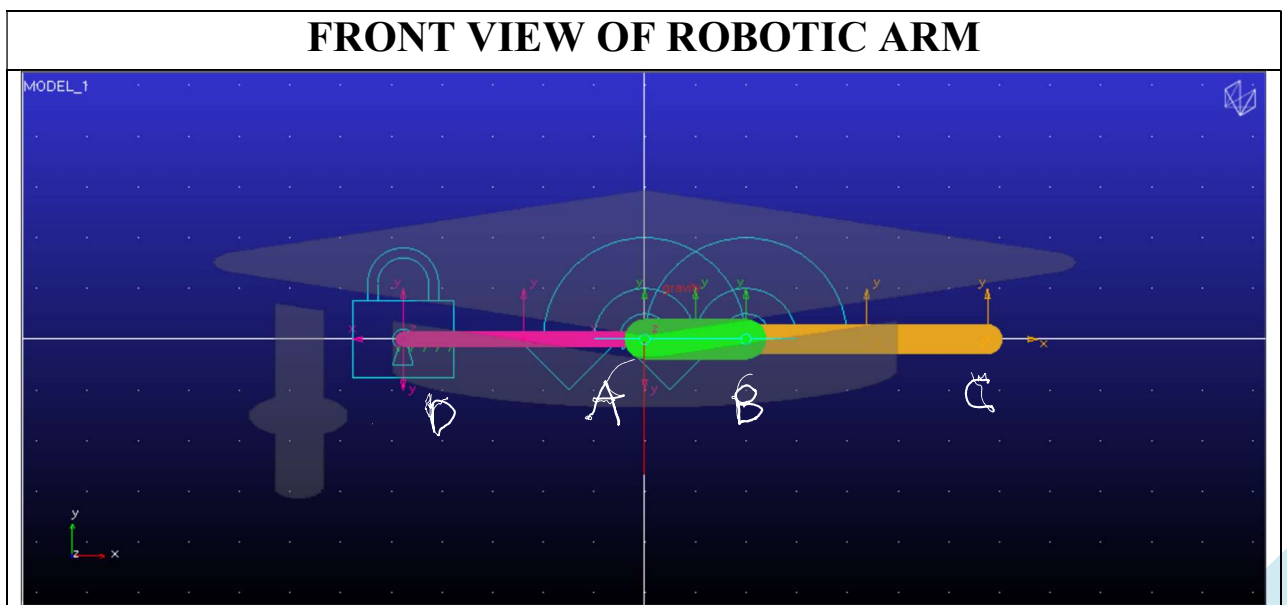

Date: March 5,2023

Given Information

	Input Values		Link Lengths		
Roll Number	X	Y	AB	BC	Translation Distance
200020023	2.383	2.01	10	23.83	20.1

Question 1 (Robotic Arm)

ISOMETRIC VIEW OF ROBOTIC ARM


FRONT VIEW OF ROBOTIC ARM

Question 2 (No Translation)

Function Builder Commands	
JOINT MOTION TYPE	
Velocity	
CODE FOR JOINT A	Using Nested IF Loops
IF(time-1.5: 30.0d,0,IF(time-3: 0,-30.0d, IF(time-4.5: -30.0d, 0,IF(time-6: 0,0,0))))	
CODE FOR JOINT B	
IF(time-1.5: 0,30.0d,IF(time-3: 30.0d,0,IF(time-4.5: 0, 30.0d,IF(time-6: -30.0d,0,0))))	
JOINT MOTION TYPE	
Displacement	
CODE FOR JOINT A	Using STEP Function
STEP(time, 0.0, 0.0d, 1.5, 45.0d) + STEP(time, 3.0, 0.0d, 4.5, -45.0d)	
CODE FOR JOINT B	
STEP(time, 1.5, 0.0d, 3.0, 45.0d) + STEP(time, 4.5, 0.0d, 6.0, -45.0d)	

WORKSPACE BOUNDARY TRACE WITHOUT TRANSLATION OF GROUND PIVOT
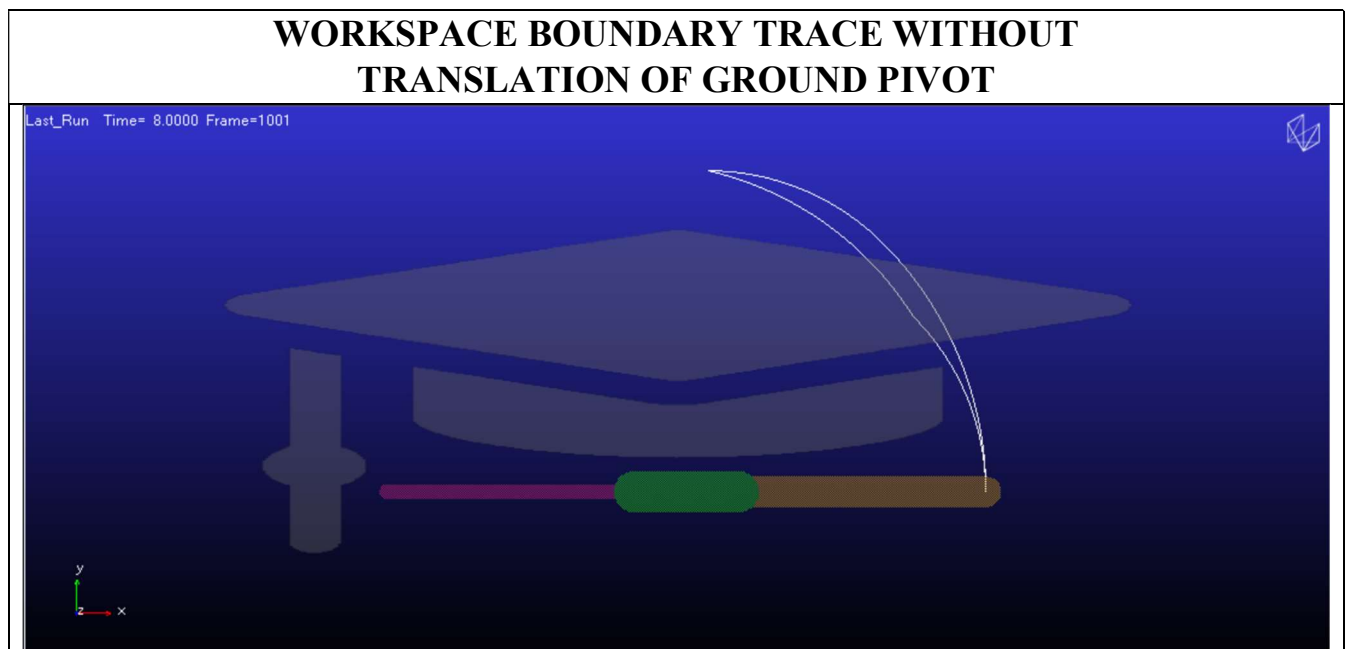
Question 3 (With Translation)

Function Builder Commands	
JOINT MOTION TYPE	
Velocity	
CODE FOR JOINT A	
IF(time-1.5: 30.0d,0,IF(time-3: 0,0,IF(time-4.5: 0,-30.0d, IF(time-6: -30.0d, 0,IF(time-7.5: 0,0,0)))))	Using Nested IF Loops
CODE FOR JOINT B	
IF(time-1.5: 0,30.0d,IF(time-3: 30.0d,0,IF(time-4.5: 0,0,IF(time-6: 0,-30.0d,IF(time-7.5: -30.0d,0,0)))))	
TRANSLATION CODE FOR JOINT D	
IF(time-3: 0, 134,IF(time-4.5: 134, 0, 0))	
JOINT MOTION TYPE	
Displacement	
CODE FOR JOINT A	Using STEP Function
STEP(time, 0.0, 0.0d, 1.5, 45.0d)+STEP(time, 4.5, 0.0d, 6.0, -45.0d)	
CODE FOR JOINT B	
STEP(time, 1.5, 0.0d, 3.0, 45.0d) +STEP(time, 6.0, 0.0d, 7.5, -45.0d)	
TRANSLATION CODE FOR JOINT D	
STEP(time, 3.0, 0.0, 4.5, 201) + STEP(time, 7.5, 0.0, 9.0, -201)	

WORKSPACE BOUNDARY TRACE WITH TRANSLATION OF GROUND PIVOT
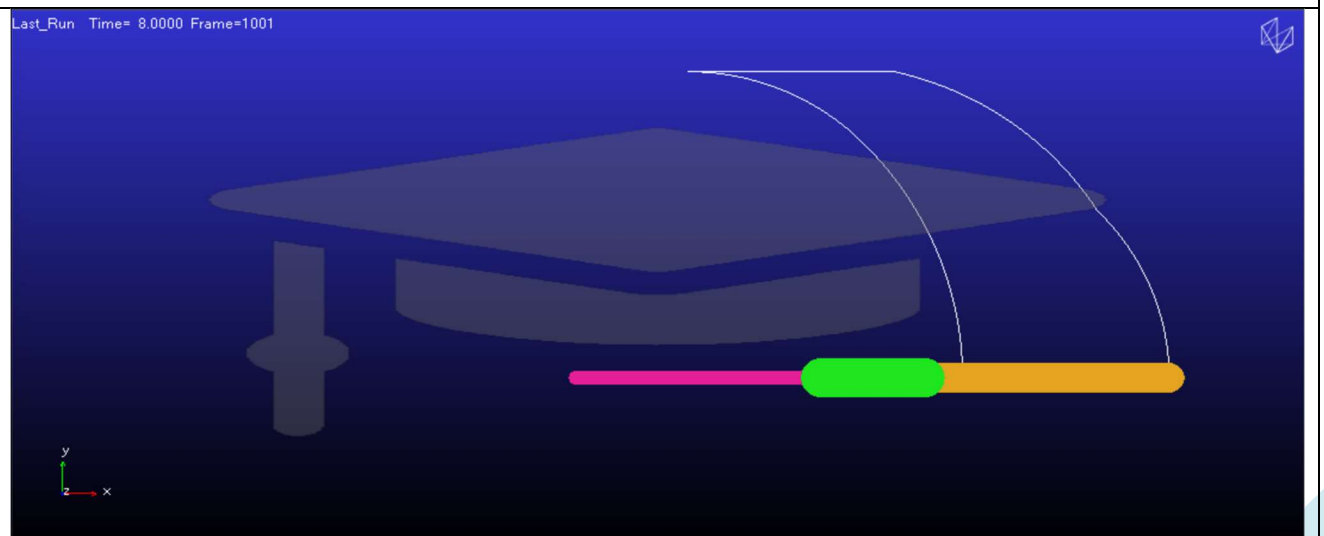
Question 4 (End Effector)

Function Builder Commands	
JOINT MOTION TYPE	
Velocity	Using Nested IF Loops
CODE FOR JOINT A	
IF(time-1.5: 30.0d,-30.0d, IF(time-3: -30.0d,0,0))	
CODE FOR JOINT B	
IF(time-1.5: 30.0d,-30.0d, IF(time-3: -30.0d,0,0))	
TRANSLATION CODE FOR JOINT D	
IF(time-1.5: 134,-134, IF(time-3: -134,0,0))	
JOINT MOTION TYPE	
Displacement	Using STEP Function
CODE FOR JOINT A	
STEP(time, 0.0, 0.0d, 1.5, 45.0d) + STEP(time, 1.5, 0.0d, 3.0, -45.0d)	
CODE FOR JOINT B	
STEP(time, 0.0, 0.0d, 1.5, 45.0d) + STEP(time, 1.5, 0.0d, 3.0, -45.0d)	
TRANSLATION CODE FOR JOINT D	
STEP(time, 0.0, 0.0, 1.5, 201)+STEP(time, 1.5, 0.0, 3.0, -201)	

POSITION OF END EFFECTOR FOR SIMULTANEOUS MOTION OF ALL ACTUATORS

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