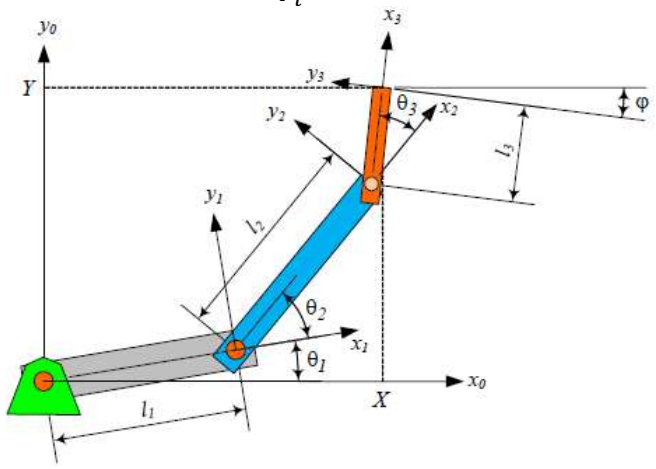
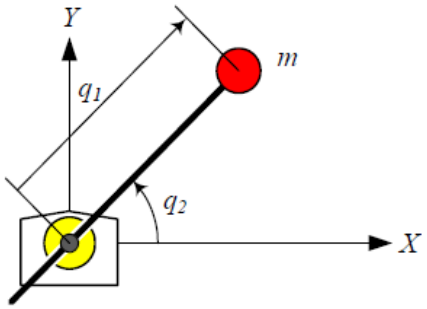
MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

SEVENTH SEMESTER B. TECH (ELECTRONICS AND INSTRUMENTATION)
PROCTORED ONLINE MAKE-UP EXAMINATION - Feb/March. 2022
SUBJECT: ROBOTICS (ICE-4068)

TIME: 2.20-3:35 PM **DATE: 22/02/2022** **MAX MARKS 20**

Note: Answer All questions

1	A	Briefly explain how the robots are clsssified.	3M
	B	For the 3R planar manipulator, shown in Figure 1B, find the individual frame D-H transformation matrices $i-1_{T_i}\ i = 1,2,3$.  **Figure 1B**	4M
	C	Find the Lagrangean of a planar polar manipulator as shown in Figure 1C.  **Figure 1C**	3M
2	A	The conditions for a sequence of points are given here. Find a path to satisfy the conditions given below:	3M

		$q(0) = 3\ deg, \dot{q}(0) = 0, \ddot{q}(0) = 0$ $q(0.4) = 45\ deg, q(0.75) = 90\ deg$ $q(1) = 90\ deg, \dot{q}(1) = 0, \ddot{q}(1) = 0$	
	B	Briefly explain the different types of linear control techniques used in robotics.	3M
	C	Obtain the DH transformation matrices for a link with R‖R or R‖P joints.	4M