Academic Year:	2020/2021	Term Exam:	First Term	
Department:	MDP	Course Code:	MDP491	
Date:	22/12/2020	Course Title:	Comp. Dyn.	
Time:	1 hour	Full Mark:	10	

For each of the following mechanisms; use the provided table for links' lengths and initial value of generalized coordinates in order to solve these systems as kinematical driven systems.

Requirements:

1. The components of the vectors and matrices ($\mathbf{C}, \mathbf{C_q}, \mathbf{C}_t, \mathbf{Q}_d$)
2. Fill the values in the tables following each question for positions, velocity and accelerations after 2 seconds.

Note that:

- The frame of each pinned-pinned link is located in its middle. The length of the link i is l^i.
- Driving constraint $\dot{\theta}^2 = \omega^2$

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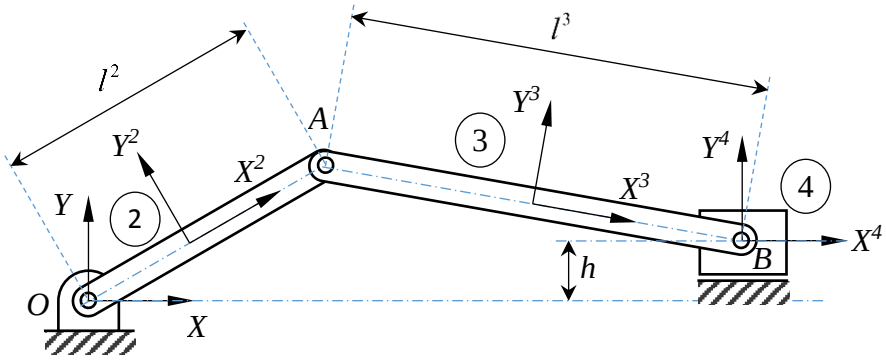
Question (1): [5 Marks]



(1) Offset crank slider mechanism

l^2	0.2 m	h	0.05 m
l^3	0.3 m	ω^2	4 rad/s
$R_x{}^2$	0.0968 m	$R_x{}^3$	0.344 m
$R_y{}^2$	0.025 m	$R_y{}^3$	0.05 m
θ^2	14.48 °	θ^3	0 °
$R_x{}^4$	0.494 m		

C

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$\mathbf{C_q}$

$\mathbf{C}_t$

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$\mathbf{Q}_d$

Solution after 2 seconds

$R_x^{\,2}$		$\dot{R}_x^{\,2}$		$\ddot{R}_x^{\,2}$	
$R_y^{\,2}$		$\dot{R}_y^{\,2}$		$\ddot{R}_y^{\,2}$	
θ^2		$\dot{\theta}^2$		$\ddot{\theta}^2$	
$R_x^{\,3}$		$\dot{R}_x^{\,3}$		$\ddot{R}_x^{\,3}$	
$R_y^{\,3}$		$\dot{R}_y^{\,3}$		$\ddot{R}_y^{\,3}$	
θ^3		$\dot{\theta}^3$		$\ddot{\theta}^3$	
$R_x^{\,4}$		$\dot{R}_x^{\,4}$		$\ddot{R}_x^{\,4}$	

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Question (2): [5 Marks]

A. …
B. …

Question (3): [..... Mark]

A. …
B. …
C. …
D. …

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