Course Code: 1940315 **Roll No:** **MLRS- R19**

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

II B.Tech II Sem Regular End Examination, July 2021

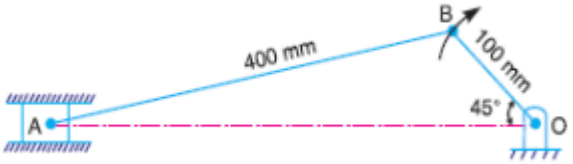
KINEMATICS OF MACHINERY

(MECH)

Time: 3 Hours. **Max. Marks: 70**

Note: 1. Answer any FIVE questions.
2. Each question carries 14 marks and may have a, b as sub questions.

1	a)	Explain the different types of constraints between Kinematic pairs, and give two examples for each	7M	CO1	BL2
	b)	A double slider mechanism is used to draw an ellipse with major axis equal to 20 cm and minor axis 15 cm. Set out the mechanism, and draw the locus of the points tracing the required ellipse.	7M	CO1	BL5
2	a)	Write the inversions of double slider crank mechanism and explain any two of them with neat sketches.	7M	CO1	BL2
	b)	What is Kutzback's criterion for degree of freedom of plane mechanisms? In what way is Grubler's criterion different from it?	7M	CO1	BL2
3	a)	What is the Coriolis acceleration component? In which cases does it occur?How is it determined?	7M	CO2	BL2
	b)	Locate all the instantaneous centres of the slider crank mechanism as shown infigure. The lengths of crank OB and connecting rod AB are 100 mm and400mm respectively. If the crank rotates clockwise with an angular velocity of10 rad/s, find i) Velocity of the slider A and ii) ii) angular velocity of the connecting rod AB.	7M	CO2	BL5



4	a)	Explain the procedure to construct Klein's construction to determine the velocity and acceleration of a slider-crank mechanism.	7M	CO2	BL2
	b)	What is Scott-Russel mechanism? What are its limitations? How is it modified?	7M	CO3	BL2
5	a)	Explain the difference between Davis & Ackermann's steering gear?	7M	CO3	BL2
	b)	Draw a neat sketch of the Peaucellier straight line motion mechanism, and prove that it produces an exact straight line motion.	7M	CO3	BL4

6	a)	Explain Convex circular arc cam with neat sketch.	7M	CO4	BL2
	b)	Deduce expressions for the velocity and acceleration of the follower when it moves with simple harmonic motion.	7M	CO4	BL3
7	a)	What is a cam? What type of motion can be transmitted with a cam and follower combination? What are its elements?	7M	CO4	BL4
	b)	Compare involute and cycloidal gear tooth profile.	7M	CO5	BL4
8	a)	What is interference? Derive the relation for the minimum number of teeth fora pair of involute profile of teeth to avoid interference.	7M	CO5	BL4
	b)	The arm of an epicyclic gear train rotates at 100 rpm anti-clockwise. The arm carries two wheels A and B, having 36 and 45 teeth respectively, and meshing with each other. Wheel A makes 200 rpm clockwise, and the arm rotates about the center of wheel A. Find the speed of wheel B.	7M	CO5	BL5

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