School of Mechanical Engineering
Mechanical Engineering
Summer Term - September 2023

Time : 3 Hours   Marks : 50

Sem V - BTME3002 - Kinematics of Machines
Your answer should be specific to the question asked
Draw neat labeled diagrams wherever necessary

1.	Name the different inversions of Four bar Kinematic Chain.	CO1	(2)
2.	Define the tern instantaneous centre for a mechanism.	CO2	(2)
3.	Write the properties of pole point.	CO3	(2)
4.	Name the different types of cams with sketches.	CO4	(2)
5.	Define the following terms related to gear: (i) Addendum (ii) Contact ratio.	CO5	(2)
6.	With a neat sketch, explain the inversion of four bar chain.	CO1	(5)
7.	In a pin jointed four bar mechanism, AB=250mm, BC=CD=350 mm and AD=500mm. The link AD is fixed and angle BAD =50°. The crank AB rotates uniformly at 100 rpm. Locate the entire instantaneous centers.	CO2	(5)
8.	Describe the classifications of synthesis problems.	CO6	(6)

9.	A cam is to be designed for a knife edge follower with the following data :
	  (i) Cam lift = 50 mm during 60° of cam rotation with simple harmonic motion.
	  (ii) Dwell for the next 30°.
	  (iii) During the next 90° of cam rotation, the follower returns to its original position with simple harmonic motion.
	  (iv) Dwell during the remaining 180°.
	The minimum radius of the cam is 45 mm. Draw the profile of the cam when the line of stroke passes through the axis of the cam shaft.
		CO3	(8)

10.	Deduce the expressions for maximum velocity and acceleration of the follower when it moves with simple harmonic motion.	CO4	(8)
11.	The number of teeth on each of the two equal spur gears in mesh is 40. The teeth have 20° involute profile and the module is 6 mm. If the arc of contact is 1.75 times the circular pitch, find the addendum.	CO5	(8)