Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–II EXAMINATION – SUMMER 2016

Subject Code:X21902 **Date:02/06/2016**

Subject Name:KINEMATICS OF MACHINES

Time:10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain the following terms: 1. Mechanical Advantage 2. Linear displacement 3. Mechanism 4. Inversion of mechanism	**07**
	(b)	List different types of straight line motion mechanisms and explain any one with neat sketch.	**07**
Q.2	**(a)**	Explain universal coupling with neat sketch.	**07**
	(b)	Explain quick return motion mechanism with neat sketch.	**07**
Q.3	**(a)**	State and explain Kennedy's theorem.	**07**
	(b)	What is the Coriolis acceleration? Derive an expression for the magnitude and direction of coriolis component of acceleration.	**07**
Q.4	**(a)**	Derive expression for the length of cross belt drive.	**07**
	(b)	A shaft which rotates at a constant speed of 150 r.p.m. is connected by belting to a parallel shaft 720 mm apart, which has to run at 60, 80 and 100 r.p.m. The smallest pulley on the driving shaft is 40 mm in radius. Determine the remaining radii of the two stepped pulleys for (i) a crossed belt, and (ii) an open belt. Neglect belt thickness and slip.	**07**
Q.5	**(a)**	Explain interference in involutes gears with neat sketch.	**07**
	(b)	State and prove the law of gearing.	**07**
Q.6	**(a)**	Classify different Cams and followers with neat sketch.	**07**
	(b)	A cam drives a flat reciprocating follower in the following approach: During first 120˚ rotation of the cam, follower moves outwards through a distance of 20 mm with SHM. The follower dwells during next 30˚ of cam rotation. During next 120˚ of cam rotation, the follower moves inwards with SHM. The follower dwells for the next 90˚ of cam rotation. The minimum radius of the cam is 25 mm. Draw the profile of the cam.	**07**
Q.7	**(a)**	Derive an expression for the torque transmitted by a single plate clutch assuming (i) Uniform pressure theory (ii) Uniform wear theory.	**07**
	(b)	Derive maximum efficiency of screw jack.	**07**

****