Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC 2ND Semester Examination – July- 2011

Subject code: X21902

Subject Name: KINEMATICS OF MACHINES

Date:15/07/2011 **Time: 10:30 am – 01:00 pm**

Total Marks: 70

Instructions:

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

Q.1	**(a)**	Differentiate between flat belt and vee belt.	**07**
	(b)	Explain coriolis component of acceleration with neat sketch.	**07**
Q.2	**(a)**	Derive expression for the length of an open belt drive.	**07**
	(b)	Two parallel shaft 6m apart are to be connected by belt running over a pulley of diameter 500mm and 300 mm respectively. find exact and approximate lengths of belt in both case when it is open and crossed.	**07**
		OR	
	(b)	Derive expression for the length of cross belt drive.	**07**
Q.3	**(a)**	In a chain drive teeth on sprockets are 50 and 15. The distance between centers of sprockets is 600mm and the dia of bigger sprocket is 300mm.Determine chain length, velocity ratio, and pitch of chain.	**07**
	(b)	Compare cycloidal and involutes tooth gears.	**07**
		OR	
Q.3	**(a)**	Explain interference in involutes gears with neat sketch.	**07**
	(b)	A pair of involutes gears with 14 and 21 teeth has angle 16 degree. Find maximum addenda on pinion and gear to avoid interference if module is 5mm.Also find length of path of contact and contact ratio.	**07**
Q.4	**(a)**	Explain force analysis of helical gear with neat sketch.	**07**
	(b)	A cam operate a flat faced follower which moves with cycloidalmotion during ascent and descent. The further specifications are: Minimum radius of cam=30mm Lift of follower=45mm,Angle of ascent=120 Angle of dwell=60,Angle of descent=90,cam speed=300rpm. Draw cam profile and find max velocity and acceleration of the follower during ascent and decent.	**07**
		OR	
Q.4	**(a)**	Derive expression for devis stearing gear mechanism.	**07**
	(b)	Hooks joints connects two shafts whose axes are intersects. if driving shaft rotates uniformly and variation in speed of driven shaft is not to exceed 5% of mean speed. Find max possible inclination between two shafts.	**07**

Q.5	**(a)**	In an I.C .mechanism stroke length is 50 cm and the obliquity ratio is 4.The angular acceleration of the C.R is 54 rad/s2, when crank makes an angle of 45 degree with IDC.while rotating uniform speed. Determine crank speed RPM, acceleration of piston, velocity and acceleration of mid point of C.R. Use klein s construction method only.	**07**
	(b)	Explain old ham coupling with neat sketch.	**07**

OR

Q.5	**(a)**	Explain different types of motions.	**07**
	(b)	What is inversion of mechanism? Explain oscilating cylinder engine with neat sketch.	**07**

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