Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(OLD) • EXAMINATION – WINTER 2016

Subject Code:141902 Date:23/11/2016

Subject Name:Kinematics Of Machines

Time:02:30 PM to 05:00 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)**	What is meant by inversion of mechanism? Sketch double slider cranks chain & draw its inversion.	**07**
	(b)	Define the following terms.(1)Link(2)Higher pair(3)Ternary Joint(4)Locked chain(5)constrained Motion(6)Degree of freedom(7)Quaternary link.	**07**
Q.2	**(a)**	Classify synthesis problems.	**07**
	(b)	Explain briefly dimensional synthesis.	**07**
		OR	
Q.2	**(a)**	Write Short Note on Straight-Line Mechanism.	**07**
	(b)	Explain cariole's component of acceleration.	07
Q.3	**(a)**	Explain the Phenomenon of "slip"& "creep" in a belt drive.	**07**
	(b)	Explain instantaneous centre method for finding out velocity of a point on link.	**07**
		OR	
Q.3	**(a)**	A Crank & rocker mechanism ABCD has the following dimensions. AB=0.85m,BC=1.35m,CD=1m,AD=1.5m.Eis the midpoint of the coupler link BC.AD is the fixed link. Crank AB has an angular velocity of 20rad/sec counter clockwise & a deceleration of 280rad/sec^2 at the instant angle DAB=60°.Find(1)instantaneous linear velocity & acceleration of midpoint E of link BC.(2) instantaneous angular velocity & acceleration of link CD.	**07**
	(b)	State & prove Kennedy's theorem.	**07**
Q.4	**(a)**	State & prove the law of gearing.	**07**
	(b)	Explain Epicycle gear train with neat sketch.	**07**
		OR	
Q.4	**(a)**	Explain terminology of gear tooth with neat sketch.	**07**
	(b)	Two parallel shafts, about 60cm apart are to be connected by spur wheels. one shaft is to run at 360rpm & the other at 120rpm.Design the wheels, if the circular pitch is to be 25mm	**07**
Q.5	**(a)**	List different types of gear train. Explain simple gear train with neat sketch. Derive the equation of velocity ratio for simple gear train.	**07**
	(b)	A pinion having 20 teeth of in volute form,20˚pressure angle & 6mm module drives a gear having 40 teeth. If addendum=module find(1)addendum & pitch circle radius of the two gears(2)length of path of approach(3)length of path of contact(4)Arc of contact.	**07**
		OR	
Q.5	**(a)**	Classify followers & explain with neat sketch.	**07**

(b) A cam operates a flat faced follower which moves with cycloid motion during ascent & descent. The further specifications are (1)Min radius of cam=30mm(2)Angle of ascent=120°(3)Angle of dwell=60(4)Lift of follower=40mm(5)Angle of decent=90(6)speed of cam=400rpm
Draw cam profile. Find maximum velocity & acceleration during ascent &decent. **07**

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