GUJARAT TECHNOLOGICAL UNIVERSITY PDDC - SEMESTER- II EXAMINATION – SUMMER 2015

Subject Code:X21902 Date:03/0			6/2015	
Ti Ins	me:1 structi 2 3	10.30am-01.00pm Total Marks: 7 ons: . . Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks.	0	
Q.1	(a)	Differentiate between the following : (1) sliding pair and rolling pair	07	
	(b)	(2) link and linkage and (3) higher pair and lower pair.What is meant by an inversion of a mechanism ? Enlist an inversion of single slider crank chain and explain any one with neat sketch.	07	
Q.2	(a) (b)	Explain coriolis component of acceleration and derive an expressions OAB is slider crank mechanism. Crank OA= 150 mm, connecting road AB =600 mm, angle AOB =45°. The crank rotates at constant angular velocity of 300r.p.m. Find velocity and acceleration of midpoint M of connecting rod AB OR	07 07	
	(b)	Locate all the instantaneous centers of the slider crank mechanism as shown in Fig. 2.1. The lengths of crank OB and connecting rod AB are 10 cm and 40 cm respectively. If the crank rotates clockwise with an angular velocity of 10 rad/s, find: 1. Velocity of the slider A, and 2. Angular velocity of the connecting rod AB.	07	
Q.3	(a)	Define and explain with neat sketch Base circle, Prime circle, Pressure angle	07	
	(b)	Draw the profile of a cam operating a knife edge follower from the following data :	07	
		(1) Follower lifts through 40 mm during 60° rotation		
		(2) Follower remains at rest for next 30° rotation of the cam.		
		(3) Follower then descends to its original position during 90°		
		rotation of the cam. (4) Follower remains at rest for the rest of the revolution. The least radius of the cam is 50 mm. The motion during ascent and descent is simple harmonic motion and the line of stroke of the follower passes through the axis of the cam shaft.		

OR

Q.3 (a) With the help of neat sketches explain the types of cams and followers.

- (b) Draw a profile of a cam rotating at uniform speed and required to give uniform velocity motion to the knife edge follower. Lift of the follower is 30 mm. Angle of rise is 90°. Angle of return is 120°. Dwell between rise and return is 75°. The minimum radius of cam is 50 mm and cam rotates in clockwise direction.
- Q.4 (a) Discuss briefly the various types of belts used for the transmission of power.
 - (b) An open flat belt drive connects two parallel shafts 1.2 meters apart. The driving and the driven shafts rotate at 350 r.p.m. and 140 r.p.m. respectively and the driven pulley is 400 mm in diameter. The belt is 5 mm thick and 80 mm wide. The coefficient of friction between the belt and pulley is 0.3 and the maximum permissible tension in the belting is 1.4 MN/m2. Determine:
 - 1. diameter of the driving pulley,
 - 2. maximum power that may be transmitted by the belting, and
 - 3. Required initial belt tension.

OR

- Q.4 (a)Classify gear trains. Give suitable application of each type of
gear train. Explain with neat sketch sun and planet type gear.07
 - (b) An epicyclic gear consists of three gears A, B and C as shown in Fig. 4.1 The gear A has 72 internal teeth and gear C has 32external teeth. The gear B meshes with both A and C and is carried on an arm EF which rotates about the centre of A at 18rpm. If the gear A is fixed, determine the speed of gears B and C.





Q.5	(a)	What are the different types of chains ? Explain with neat sketches, the	07
		power transmission chains.	
	(b)	Explain the types of ropes drives and discuss the advantages and	07
		limitation of rope drives over other drive.	
		OR	
Q.5	(a)	Explain the following : (1) dry friction (2) boundary friction (3) film	07
		friction and (4) limiting angle of friction.	
	(h)	Write a short note on rope brake dynamometer	07

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