		GUJARAT TECHNOLO	OGICAL UNIVE	ERSITY	
		BE - SEMESTER-III (NEW) EXA			
	•	Code: 2131906		Date: 18/06/2	2019
	U	Name: Kinematics of Machines			
Time: 02:30 PM TO 05:00 PM Total Mark Instructions:				Total Marks:	: 70
Insti	ruction 1.				
		Make suitable assumptions wherever	necessary.		
		Figures to the right indicate full mark			
					MARKS
Q.1	(a)	Explain the terms:			03
	<b>(b)</b>	1. Machine 2. Structure 3. Mechanism		w two)	04
	<b>(b)</b>	Sketch and explain inversions of four	vai chain mechanism(ai	ly two)	04
	(c)	What are the types of inversions? Expreturn mechanism.	lain crank and slotted le	ver type quick	07
Q.2	(a)	Classify straight line generating mecha	anisms.		03
	<b>(b)</b>				04
	(a)	centres. Explain the Freudenstein's method of	three point expethesis of	maahanisms	07
	(c)	-	$\mathbf{R}$	mechanisms.	07
	(c)	Explain chebyshev spacing method for four bar chain mechanism.		int position in	07
Q.3	(a)	Define linear and angular velocity.			03
Q.C	(b)	Write a short note on velocity and acce	eleration diagram.		04
	(c)	PQRS is a four bar chain mechanism. The length of the links are $PQ = 62.5 \text{mm}$ ; $QR = 175 \text{mm}$ ; $RS = 112.5 \text{mm}$ ; and $PS = 200 \text{ mm}$ . the link PS is			
		a fixed link. The crank PQ rotates at			
		with i.d.c. Draw the velocity and acc			
		same side of PS. Find the angular velo QR and RS.	ocity and angular accele	ration of links	
		-	R		
Q.3	(a)	Explain function generation			03
	<b>(b)</b>	· · · · · · · · · · · · · · · · · · ·			04 07
	<b>(c)</b>	·			
		conditions for input output links: $0.000$	0.00		
			: 90°		
			=2 rad/sec		
		$\alpha_2 = -1 \text{rad/sec}^2$ $\alpha_4$	=0		
Q.4	(a)	What is speed ratio and velocity ratio	on in gear trains.		03
~·-	(b)	Write a complete classification of ge			04
	(c)	Explain the working of Epicyclic g applications. what are the advantages	gear train with sketch.	•	07

•	п
	к

(a)	What are the standard tooth profiles?	03
<b>(b)</b>		04
(c)	Two involute gears of pressure angle are rotating in mesh. The speed of smallest gear is 1400 rpm. The number of teeth on pinion is 20 and gear ratio is 2. If the addendum of pinion and wheel is standard and equal to one module and module is 5mm. Consider pressure angle as 20. Find:  (i) length of arc of contact.  (ii) velocity of sliding at the point of contact.	07
	(ii) verserry or sharing at the point of contact.	
(a)	What is cam and follower?	03
<b>(b)</b>	Roller follower is more preferable to that of knife edged follower .why?	04
(c)	Define the following terms as applied to cam with neat figure. (i) Base circle (ii) Pitch circle, (iii) Pressure angle, (iv) stroke of the follower. (v) Prime circle.	07
	OR	
(a)	What are the types of motion of the follower?	03
<b>(b)</b>	With the help of neat sketches explain the types of cams and followers	04
<b>(c)</b>	Draw a cam profile for a given data:	07
	1. Outstroke during 60° of cam rotation	
	2. Dwell for the next 45 ° of cam rotation	
	3. Return stroke during next 60° of cam rotation and	
	4. Dwell for the remaining of cam rotation	
	The stroke of follower is 50mm and the minimum radius of the cam is 40mm. The follower moves with uniform velocity during both the outstroke and return strokes. The follower is of knife edge type. Draw the profile of the cam when the axis of the follower is passes through the axis of cam shaft.	
	(a) (b) (c) (a) (b) (b)	<ul> <li>(b) What is interference and undercutting in gear?</li> <li>(c) Two involute gears of pressure angle are rotating in mesh. The speed of smallest gear is 1400 rpm. The number of teeth on pinion is 20 and gear ratio is 2. If the addendum of pinion and wheel is standard and equal to one module and module is 5mm.Consider pressure angle as 20. Find: <ul> <li>(i) length of arc of contact.</li> <li>(ii) velocity of sliding at the point of contact.</li> </ul> </li> <li>(a) What is cam and follower?</li> <li>(b) Roller follower is more preferable to that of knife edged follower .why?</li> <li>(c) Define the following terms as applied to cam with neat figure. (i) Base circle (ii) Pitch circle, (iii) Pressure angle, (iv) stroke of the follower. (v) Prime circle.</li> <li>OR</li> <li>(a) What are the types of motion of the follower?</li> <li>(b) With the help of neat sketches explain the types of cams and followers</li> <li>(c) Draw a cam profile for a given data: <ul> <li>1. Outstroke during 60° of cam rotation</li> <li>2. Dwell for the next 45° of cam rotation</li> <li>3. Return stroke during next 60° of cam rotation</li> <li>4. Dwell for the remaining of cam rotation</li> <li>The stroke of follower is 50mm and the minimum radius of the cam is 40mm. The follower moves with uniform velocity during both the outstroke and return strokes. The follower is of knife edge type. Draw the</li> </ul> </li> </ul>

\*\*\*\*\*