

Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

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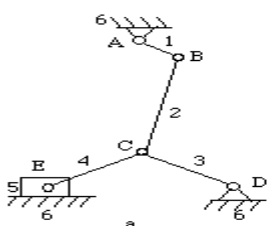
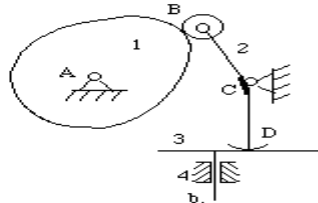
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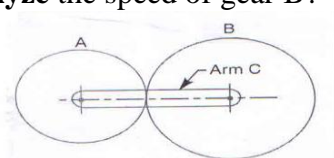
Fourth Semester B.E. Degree Examination
Kinematics of Machines

TIME: 03 Hours

Max. Marks: 100

Note: Answer any FIVE full questions, choosing at least ONE question from each MODULE.

Module -1			*Bloom's Taxonomy Level	Marks
Q.01	a	Interpret the followings a) Kinematic Chain b) Kinematic pair c) Mechanism d) Machine	L2	08
	b	Sketch and explain any two inversions of four bar chain.	L2	12
OR				
Q.02	a	Compare between a) Higher pair and lower pair b) Kinematic pair and Kinematic chain	L2	04
	b	Define degrees of freedom. Interpret the degrees of freedom for the following mechanisms as shown below  	L2	04
	c	With the help of a neat sketch explain inversions of single slider crank chain.	L2	12
Module-2				
Q.03	a	Draw a line diagram and explain Peaucellier's straight-line mechanism.	L2	10
	b	Explain the Whittworth quick return motion mechanism, with neat sketch.	L2	10
OR				
Q.04	a	With neat sketch explain crank and slotted lever quick return mechanism.	L2	10
	b	Explain the followings with the help of neat sketch Scotch yoke mechanism.	L2	10
Module-3				
Q.05	a	ABCD is a four bar chain with link AD Fixed. The lengths of the links are AB= 62.5mm, BC= 175mm, CD= 112.5mm and AD = 200 mm. The crank AB rotates at 10 rad/sec clockwise. Draw the velocity and acceleration diagram when angle BAD= 60° and "B" AND "C" Lie on the same side of D. Identify the angular velocity and angular acceleration of links BC and CD by using geometrical method.	L3	20
OR				

Q. 06	a	Identify the Rubbing velocity at a pin point.	L3	10
	b	Identify the Coriolis components of acceleration.	L3	10
Module-4				
Q. 07	a	Identify and prove law of gearing.	L3	10
	b	In an Epicyclic gear train, an arm carries two gears A and B having 36 and 45 teeth respectively. If the arm rotates at 150 rpm in the anticlockwise direction about the center of the gear, A which is fixed, Analyze the speed of gear B. If the gear a instead of being fixed, makes 300 rpm in the clockwise direction, Analyze the speed of gear B? 	L4	10
OR				
Q. 08	a	Develop an expression for path of contact.	L3	10
	b	Two gear wheel mesh externally and are to give a velocity ratio of 3. The teeth are of involute form of module 6 mm and standard addendum one module, pressure angle = 18° , pinion rotates at 90 rpm. Analyze the followings i) number of teeth on each gear to avoid interference ii) Length of path of contact iii) length of arc of contact iv) maximum velocity of sliding between teeth.	L4	10
Module-5				
Q. 09	a	Construct the profile of a cam operating a knife edge follower having a lift of 30 mm. The cam raises the follower with simple harmonic motion for 150° of the rotation followed by a period of dwell for 60° . The follower descends for the next 100° rotation of the cam with uniform velocity, again followed by a dwell period. The cam rotates at a uniform speed of 120 rpm and has a least radius of 20 mm. What will be the maximum velocity and acceleration of the follower during the lift and the return?	L2	20
OR				
Q. 10	a	Construct the profile of a cam operating a roller reciprocating follower with the following data: minimum radius of cam = 25mm; lift = 30mm; roller diameter = 15mm. The cam lifts the follower for 120° with SHM followed by a dwell period of 30° . Then the follower lowers down during 150° of the cam rotation with uniform acceleration and deceleration followed by a dwell period. If the cam rotates at a uniform speed of 150 rpm. Calculate the maximum velocity and acceleration of the follower during descent and accent period.	L2	20

*Bloom's Taxonomy Level: Indicate as L1, L2, L3, L4, etc. It is also desirable to indicate the COs and POs to be attained by every bit of questions.