Q.P. Code: 20ME0304 **R20**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March-2023

KINEMATICS OF MACHINERY

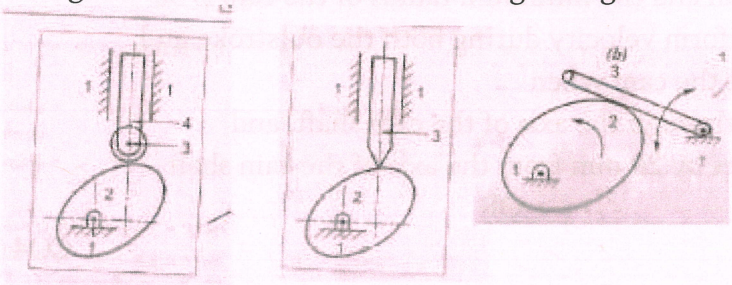
(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

1	a	Find the degrees of freedom for the following linkages.	CO1	L1	8M



	b	Define the following terms (i) Lower and Higher pairs (ii) Degree of freedom	CO1	L1	4M

OR

2		What are the practical applications of inversions of the single slider crank chain? Explain all with neat sketch.	CO1	L1	12M

UNIT-II

3		With neat sketch, explain the Ackerman steering gear of an automobile.	CO2	L2	12M

OR

4		With neat sketch, explain the working of Universal joint. And write applications also.	CO2	L4	12M

UNIT-III

5		The dimensions of the mechanism, as shown in Fig. 7.30, are as follows: AB = 0.45 m; BD = 1.5 m: BC = CE = 0.9 m. The crank AB turns uniformly at 180 r.p.m. in the clockwise direction and the blocks at D and E are working in frictionless guides. Draw the velocity diagram for the mechanism and find the velocities of the sliders D and E in their guides. Also determine the turning moment at A if a force of 500 N acts on D in the direction of arrow X and a force of 750 N acts on E in the direction of arrowY.	CO3	L1	12M

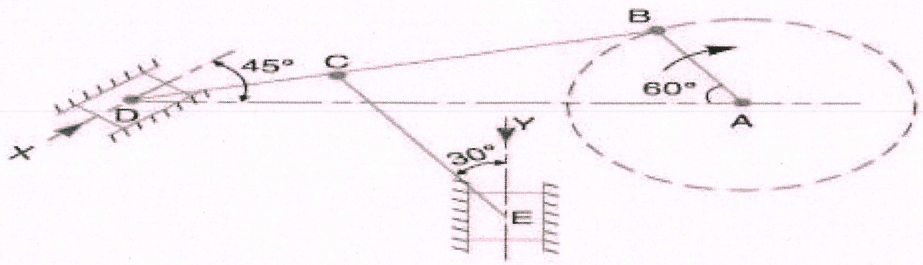


Fig. 7.30

OR

6	In a four bar chain ABCD, AD is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 120 r.p.m. clockwise, while the link CD = 80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°.	CO3	L1	12M

UNIT-IV

7	A cam is to give the following motion to a knife-edged follower : 1. Outstroke during 60° of cam rotation; 2. Dwell for the next 30° of cam rotation; 3. Return stroke during next 60° of cam rotation, and 4. Dwell for the remaining 210° of cam rotation. The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when (i) The axis of the follower passes through the axis of the cam shaft, and (ii) The axis of the follower is offset by 20 mm from the axis of the cam shaft.	CO4	L5	12M

OR

8	Define the following terms i. Cam ii. Follower iii. Offset follower iv. Radial follower v. Mushroom follower	CO4	L1	12M

UNIT-V

9	Explain the epicycloid and hypocycloidal forms of teeth with neat sketch	CO5	L2	12M

OR

10	a	Explain the terms relates to spur gear :(i) Module, (ii) Pressure angle, and (iii)Addendum	CO5	L2	6M
	b	What do you understand by 'gear train'? Discuss various types of gear trains.	CO5	L1	6M

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