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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations December-2021

KINEMATICS OF MACHINERY

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 Explain the inversions of double slider crank chain with neat sketch and list out the practical applications of inversions. L3 12M

OR

- 2 a Explain the working of beam engine with neat sketch L2 6M
b Explicate the working of Oscillating cylinder engine with neat sketch. L2 6M

UNIT-II

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

OR

- 4 a Differentiate between the Davis and Ackerman's steering mechanism. L4 6M
b What are the disadvantages of Davis steering gear mechanism L1 6M

UNIT-III

- 5 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° L3 12M

OR

- 6 a Discuss the three types of instantaneous centres for a mechanism L6 6M
b Write the relation between the number of instantaneous centres and the number of links in a mechanism. L1 6M

UNIT-IV

- 7 A cam is to give the following motion to a knife-edged follower : L2 12M
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

OR

- 8** A cam rotating clockwise at a uniform speed of 1000 r.p.m. is required to give a roller follower the motion defined below : **L2 12M**
1. Follower to move outwards through 50 mm during 120° of cam rotation,
 2. Follower to dwell for next 60° of cam rotation,
 3. Follower to return to its starting position during next 90° of cam rotation,
 4. Follower to dwell for the rest of the cam rotation.
- The minimum radius of the cam is 50 mm and the diameter of roller is 10 mm. The line of stroke of the follower is off-set by 20 mm from the axis of the cam shaft. If the displacement of the follower takes place with uniform and equal acceleration and retardation on both the outward and return strokes, draw profile of the cam and find the maximum velocity and acceleration during out stroke and return stroke.

UNIT-V

- 9 a** What do you understand by the term 'interference' as applied to gears? **L1 6M**
- b** Write advantages and disadvantages of gears **L1 6M**
- OR**
- 10** Explain briefly the differences between simple, compound, and epicyclic gear trains. What are the special advantages of epicyclic gear trains? **L4 12M**

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