

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

B.Tech II Year I Semester Supplementary Examinations June-2024

KINEMATICS OF MACHINERY

(Mechanical Engineering)

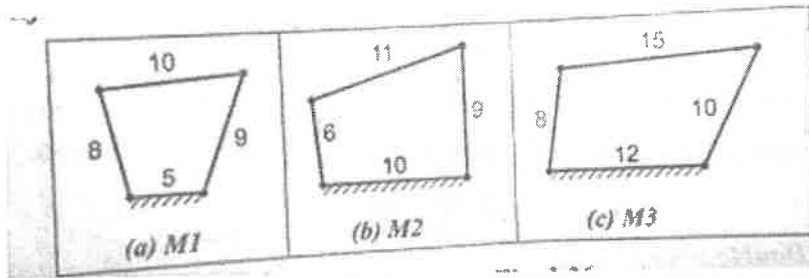
Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a Define the Grashof's law and identify the mechanism produced by the following linkage. CO1 L1 6M



- b Write the Kutzbach criterion and why it is used? Show the proof. CO1 L3 6M

OR

- 2 What are the practical applications of inversions of the single slider crank chain? Explain all with neat sketch. CO1 L2 12M

UNIT-II

- 3 a Differentiate between the Davis and Ackerman's steering mechanism CO2 L4 6M
b Sketch and Describe the working of Peaucellier mechanism. CO2 L4 6M

OR

- 4 Explain the working of Universal joint With neat sketch, and write the applications. CO2 L4 12M

UNIT-III

- 5 Explain with sketch the instantaneous centre method for determination of velocities of links and mechanisms. CO3 L3 12M

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 L4 12M

UNIT-IV

- 7 a Explain with sketches the different types of followers. CO4 L2 6M
b Draw the displacement, velocity and acceleration diagrams for a CO4 L3 6M
follower when it moves with simple harmonic motion.

OR

- 8 Design a cam for operating the exhaust valve of an oil engine. It is CO5 L5 12M
required to give equal uniform acceleration and retardation during
opening and closing of the valve each of which corresponds to 60° of
cam rotation. The valve must remain in the fully open position for 20° of
cam rotation. The lift of the valve is 37.5 mm and the least radius of the
cam is 40 mm. The follower is provided with a roller of radius 20 mm
and its line of stroke passes through the axis of the cam.

UNIT-V

- 9 a Explain the terms :(i) Module, (ii) Pressure angle, and (iii) Addendum. CO5 L1 6M
b What do you understand by the term 'interference' as applied to gears? CO5 L1 6M

OR

- 10 Explain briefly the differences between simple, compound, and epicyclic CO5 L4 12M
gear trains. What are the special advantages of epicyclic gear trains.

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