Code No.: ME402PC | R20 | H.T.No. | | | 8 | R | | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–II–Semester End Examinations (Supply) - July - 2024
KINEMATICS OF MACHINERY
(MECH)

[Time: 3 Hours] [Max. Marks: 70]

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A (20 Marks)

1. a) Explain the term link or element. [2M]
   b) What is Degrees of freedom? [2M]
   c) Describe the concept of velocity analysis? [2M]
   d) What are the components of Coriolis Acceleration? [2M]
   e) What is the use of pantograph? [2M]
   f) Define Kinematic link. [2M]
   g) List the types of followers. [2M]
   h) Explain about cylindrical cam? [2M]
   i) What is Epicyclic gear train? [2M]
   j) What is Backlash? [2M]

PART-B (50 Marks)

2. Sketch and explain any two inversions of a double slider crank chain? [10M]

OR

3. In a crank and slotted lever quick return motion mechanism, the distance between the fixed centres is 240mm and the length of the driving crank is 120mm.Find the inclination of the slotted bar with the vertical in the extreme position and the time ratio of cutting stroke to the return stroke. If the length of the slotted bar is 450mm,find the length of the stroke if the line of stroke passes through the extreme positions of the free end of the lever. [10M]

4. Draw the velocity diagram of a slider crank mechanism? [10M]

OR

5. Explain how the coriolis component of acceleration arises when a point is rotating about same other fixed point and at the same time its distance from the fixed point varies? [10M]

6. Derive an expression for the ratio of shafts velocities for hook's joint and draw the polar diagram of driven shaft speed. [10M]

OR

7. Draw the sketch of a mechanism in which a point traces an Exact straight line. The mechanism must be made of only revolute pairs. Prove that the point traces an exact straight line motion. [10M]

8. Derive the expression for velocity and acceleration during out stroke and return stroke of the follower of SHM. [10M]

OR

9. Draw the displacement velocity and acceleration diagrams when the follower moves with uniform velocity? [10M]

10. Explain briefly the differences between Simple, Compound and epicyclic gear trains. What are the special advantages of epicyclic gear train? [10M]

OR

11. Two gears of module 4mm have 24 and 33 teeth. The pressure angle is 20^0 and each gear has a standard addendum of one module. Find the length of arc of contact and the maximum velocity of sliding if the pinion rotates at 120 rpm. [10M]

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