

**Kinematics and Machines (MEE-S203T)**

**Semester: 2022-23 (Odd Semester)**

**Year: 2<sup>nd</sup> Year**

**Mid Semester Examination**

**Time: 1.5 h**

**Maximum marks: 30**

All questions are compulsory

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**Section A**

9 marks (9 questions of 1 mark each)

1. Define Mechanism.
2. Give example of lower and higher pair.
3. Write the formulae for DOF for planer mechanism.
4. Draw elliptical trammel mechanism.
5. Number of instantaneous centre of rotation for planer mechanism.
6. State Kennedy theorem.
7. Write about inversion of four bar mechanism.
8. Write the expression for velocity of slider for slider crank mechanism.
9. Explain binary link, ternary link.

**Section B**

9 marks (3 questions of 3 marks each,)

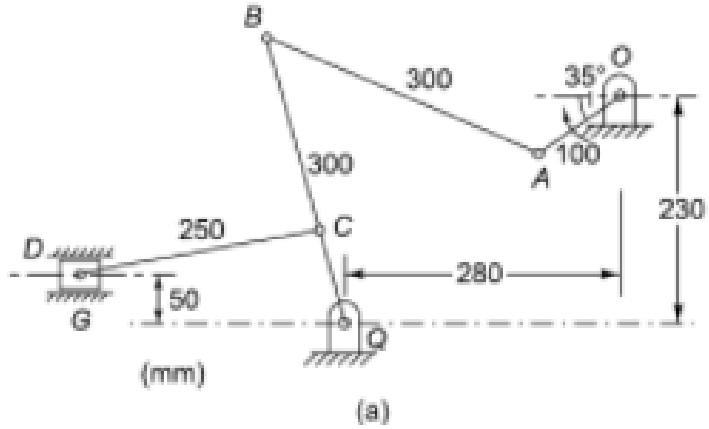
1. In a slider – crank mechanism, the crank is 480 mm long and rotates at 20 rad/s in the counter-clockwise direction. The length of the connecting rod is 1.6 m. When the crank turns 60° from the inner-dead centre, determine The Velocity of the slider.
2. In a slider – crank mechanism, the crank is 480 mm long and rotates at 20 rad/s in the counter-clockwise direction. The length of the connecting rod is 1.6 m. When the crank turns 60° from the inner-dead centre, Draw velocity diagram.
3. In a slider – crank mechanism, the crank is 480 mm long and rotates at 20 rad/s in the counter-clockwise direction. The length of the connecting rod is 1.6 m. When the crank turns 60° from the inner-dead centre, Locate all instantaneous centre of rotation.

**P.T.O**

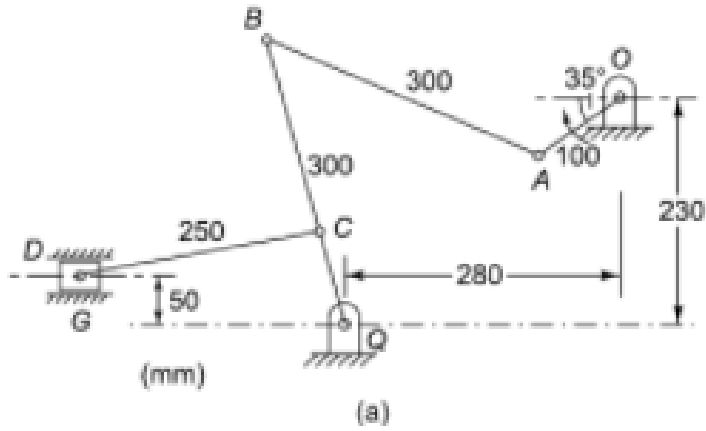
### Section C

1. A mechanism in which  $OA = QC = 100$  mm,  $AB = QB = 300$  mm and  $CD = 250$  mm. The crank  $OA$  rotates at 150 rpm in the clockwise direction. Determine the

- (i) Velocity of the slider at  $D$
- (ii) Angular velocities of links  $QB$  and  $AB$ .



2. Write number of turning pair, slider pair, binary link, ternary link in given figure.



[6 x 2]