



VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

22BME0483

SCHOOL OF MECHANICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST – I
WINTER SEMESTER 2023-2024

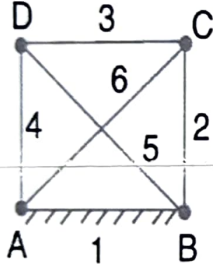
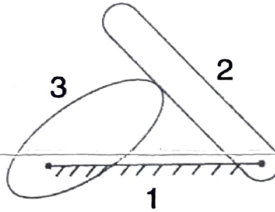
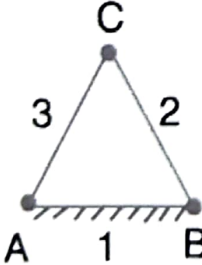
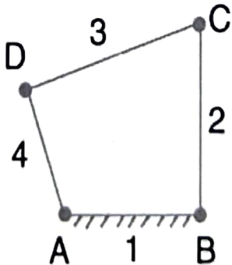
Reg. No.

(To be filled by the student)

22BME0483

Programme Name & Branch : B.Tech (Mechanical Engineering)
Course Code : BMEE207L
Course Name : Kinematics and Dynamics of Machines
Faculty Name(s) : Akash Mohanty, Venkatesan K, Edwin Sudhagar, M Manikandan, Rajasekhara Reddy Mutra, Naveen J.
Class Number(s) : VL2023240504295, 4639, 6547, 4296, 4298, 4297
Slot : B1+TB1
Date of the Exam : 12/02/2024
Exam Duration : 90 minutes Maximum Marks: 50

General instruction(s): Draw the velocity and acceleration diagrams with a suitable scale.

Q. No	Answer all questions	Marks
1.	Find the degrees of freedom for the following mechanisms (a)  (b)  (c)  (d)  Figure. 1	10
2.	The kinematic chain is made up of four bar links. All four links are turning to each other with one of the links as fixed. Find the linkage assembly mechanism obtained. With a neat drawing demonstrate two different inversions with appropriate application from the process.	10
3.	The crank of a slider crank mechanism rotates clockwise at a constant speed of 300 r.p.m. The crank is 150 mm and the connecting rod is 600 mm long. Determine : 1. linear velocity at the midpoint of the connecting rod, and 2. angular velocity at the connecting rod, at a crank angle of 45° from inner dead centre position.	10



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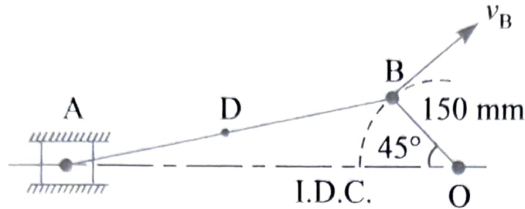


Figure. 2

4. The crank of a slider crank mechanism rotates clockwise at a constant speed of 300 r.p.m. The crank is 150 mm and the connecting rod is 600 mm long. Determine : 1. Acceleration of the midpoint of the connecting rod, and 2. Angular acceleration of the connecting rod, at a crank angle of 45° from inner dead centre position.

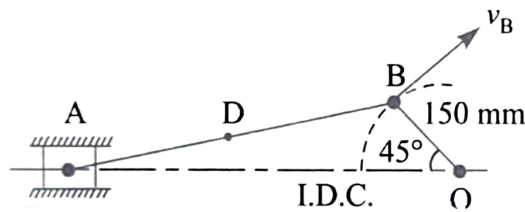


Figure. 3

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5. A cam is to give the following motion to a knife-edged follower:
1. Outstroke during 70° of cam rotation;
 2. Dwell for the next 30° of cam rotation;
 3. Return stroke during next 70° of cam rotation, and 4. Dwell for the remaining 190° 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 the axis of the follower passes through the axis of the cam shaft.

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