



SCHOOL OF MECHANICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST (CAT) -II
FALL SEMESTER 2025-2026

Programme Name & Branch	: B. Tech (BCL/BCM/BME/BIT/BPI/BEE)
Course Code	: BMEE201L
Course Name	: Engineering Mechanics
Faculty Name(s)	: Nishant Tiwari
Class Number(s)	: VL2025260103318
Date of Examination	: 05/10/2025
Exam Duration	: 90 minutes

Maximum Marks: 50

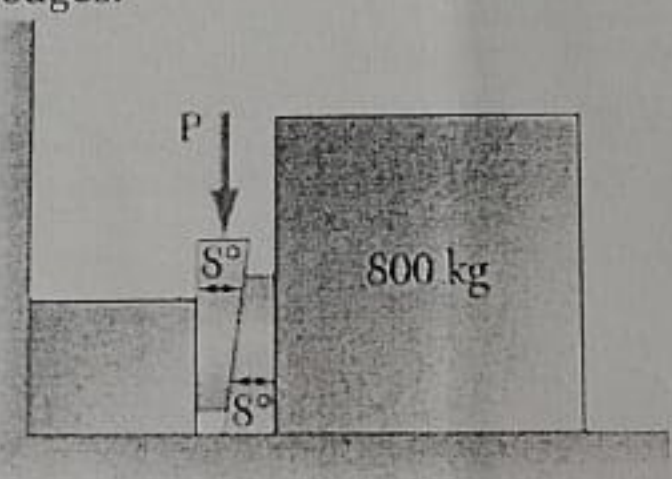
General instruction(s): Only Hand written materials are permitted.

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes Statements:

CO. 1: Compute the resultant and analyse equilibrium (without and with friction) system of forces acting on particles and rigid bodies in plane and space.

CO. 3: Apply transfer theorems to determine properties of various sections

CO. 4: Calculate motion parameters of particles and rigid bodies.

Q. No	Question	M	CO	BL
1.	Two 8° wedges of negligible weight shown in Fig. 1 are used to move and position the 800-kg block. Knowing that the coefficient of static friction is 0.30 at all surfaces of contact, determine the smallest force P that should be applied as shown to one of the wedges.  Figure 1	10	1	4
2.	A 6.5-m ladder AB leans against a wall as shown in Fig. 2. Assuming that the coefficient of static friction μ_s is the same at A and B, determine the smallest value of μ_s for which equilibrium is maintained. Take $\theta = 67.3^\circ$	10	1	

PBP
HHR

2.5
6.5



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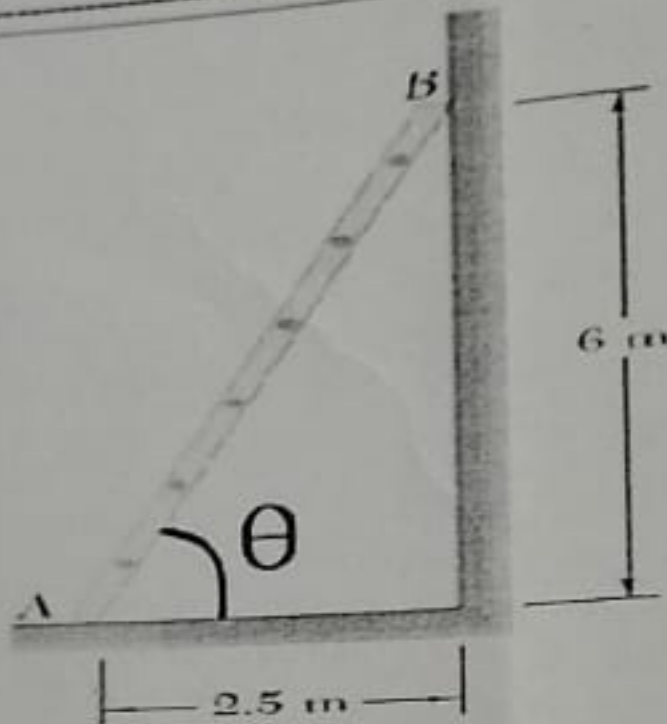


Figure 2

3. Locate the centroid of the plane area shown to Fig. 3.

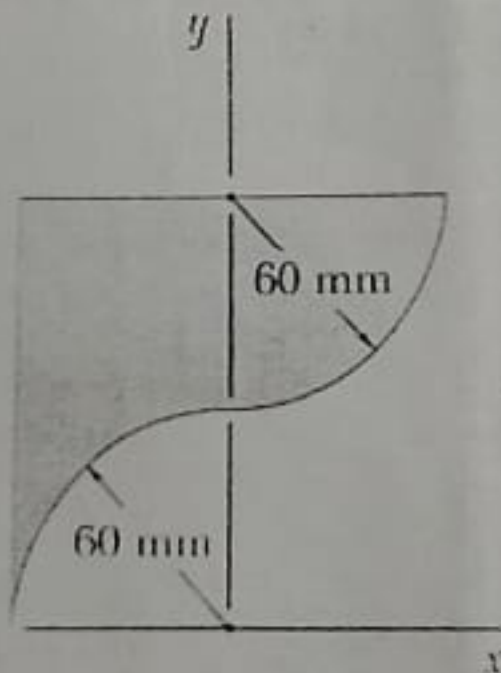


Figure 3

4. Determine second moment of area about the centroidal horizontal and vertical axes.

10

3

10

3



VIT

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SLOT: A1+TA1

REG.NO.:

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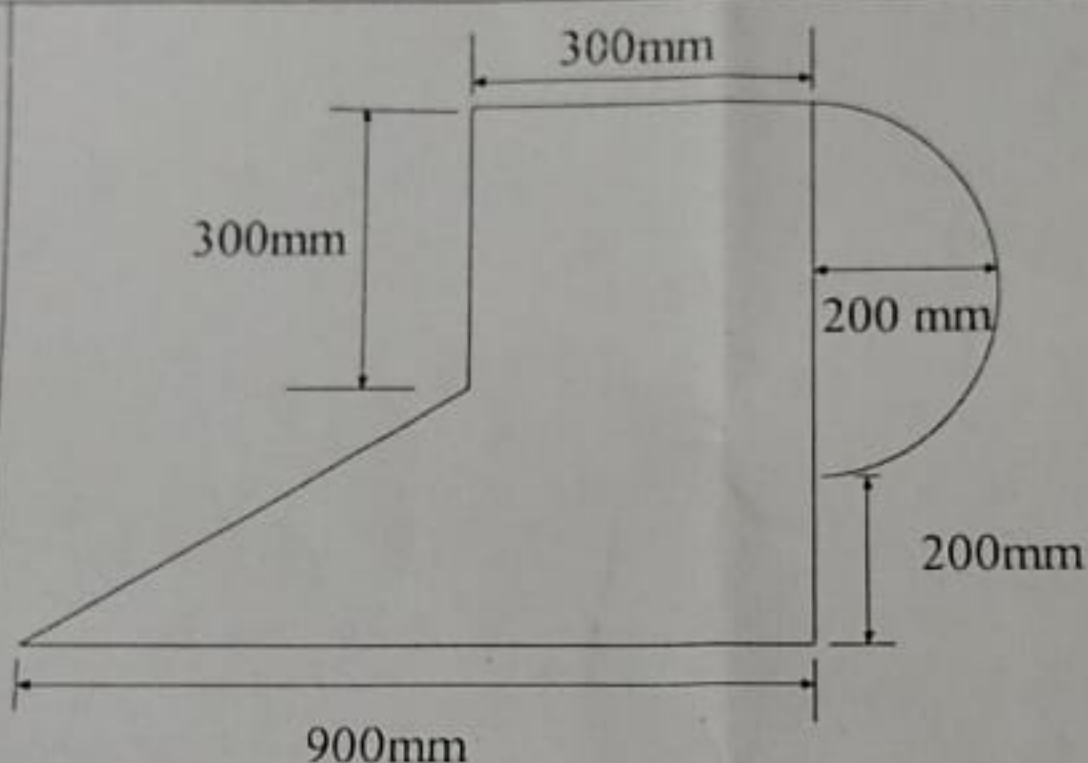


Figure 4

5.	The equation of motion of a particle moving in a straight line is given by: $s = 18t + 3t^2 - 2t^3$ where (s) is in metres and (t) in seconds. Find (i) velocity and acceleration at start, (ii) time, when the particle reaches its maximum velocity, and (iii) maximum velocity of the particle.	10	4	4
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18

$$4x - 3$$

12