



VIT

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

SLOT: B2+TB2

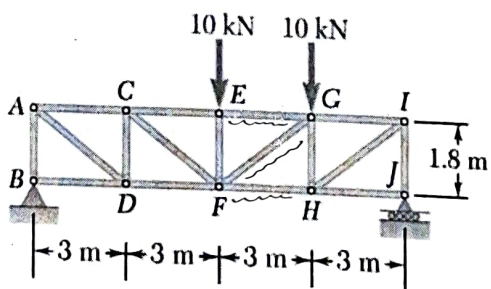
REG.NO. 21ME02012

SCHOOL OF MECHANICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST (CAT) -II
WINTER SEMESTER 2024-2025

Programme Name & Branch : BTech - Mechanical
Course Code : BMEE201L
Course Name : Engineering Mechanics
Faculty Name(s) : Prof. Bikash Routh, Prof. Sridharan K, Prof. Rahul Singh
Sikarwar, Prof. Seenuvasaperumal P, Prof. Velu M
Class Number(s) : VL2024250503235, 3248, 3270, 3273, 3323
Date of Examination : 17-March-2025
Exam Duration : 90 minutes
Maximum Marks: 50

General Instruction(s):

- Answer **all the 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) of system of forces acting on particles and rigid bodies in plane and space.
 - CO. 2: Predict the support-reactions and the internal forces of the members of trusses and frames.
 - CO. 3: Apply transfer theorems to determine the properties of various sections

Q. No	Question	M	CO	BL
1.	Determine the force in members EG, FG, and FH of the truss shown in Figure 1.  Figure 1	10	2	4
2.	A uniform ladder of length 7m rests with one end against a vertical wall and the other end on the ground. The inclination of the ladder to the ground is 35°. How far can a man (whose weight is 80% of that of the ladder) climb before slipping starts? The coefficient of friction between the ground and the ladder is 0.6 and the coefficient of friction between the wall and the ladder is 0.4.	10	1	4
3.	Two identical blocks A and B are connected by rod and rest against vertical and horizontal planes respectively as shown in Figure 3. If sliding impends when $\theta=45^\circ$. Determine the coefficient of friction, also assume it to be the same in both walls.	10	1	2



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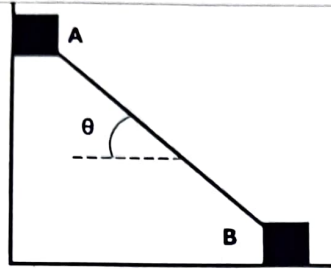


Figure 3

4.

Determine the centroid of the given section as shown in Figure 4 with respect to its origin.

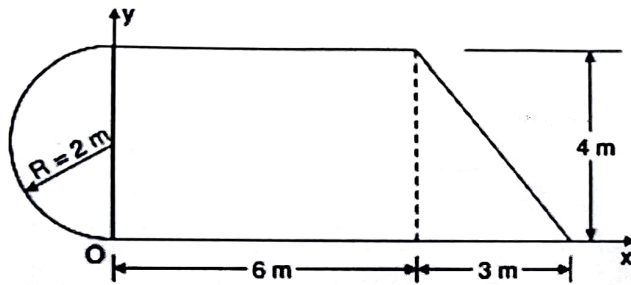


Figure 4

10

3

3

5.

Determine the moment of inertia about the centroidal axis for the I-section as shown in Figure 5.

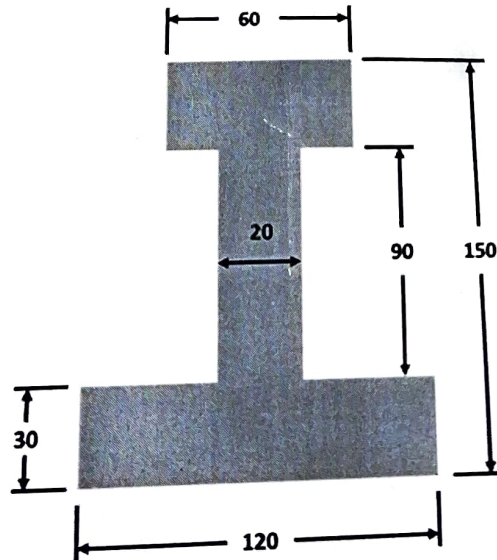


Figure 5

10

3

4
