

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

SLOT: B2+TB2

REG.NO.: [REDACTED]

**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



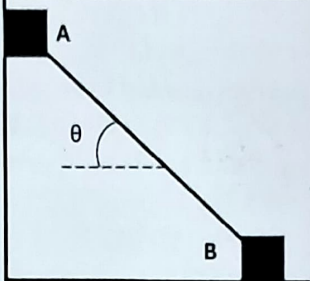
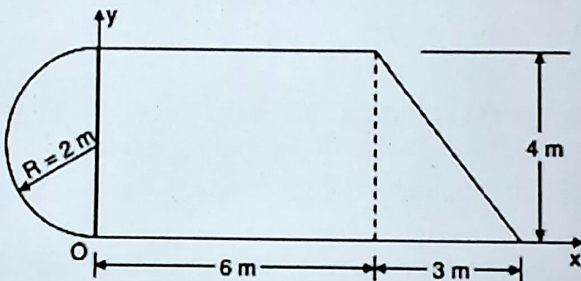
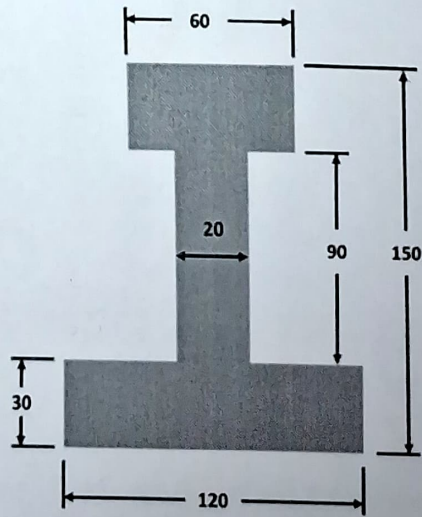
VIT

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

SLOT: B2+TB2

REG.NO.:

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

	 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
