



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

SLOT: A1+TA1

SCHOOL OF MECHANICAL ENGINEERING

CONTINUOUS ASSESSMENT TEST – II

FALL SEMESTER 2022-2023

Programme Name & Branch: B.Tech. & Mechanical Engineering

Course Code/Name: BMEE201L/Engineering Mechanics

Faculty Name(s): Dr. Bikash Routh / Dr. Sharan Chandran M/ Dr. P.Suya Prem Anand

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Class Number(s): 5446 / 5369 /5517

Exam Duration: 90 minutes

Maximum Marks: 50

General instruction(s): Answer ALL the questions. $5 \times 10 = 50$

1. Calculate the force P necessary to initiate movement of the 40 Kg Cylinder shown in Figure 1. Friction coefficient of both surfaces is 0.25. What is friction at B? Calculate the mechanical advantages of the system. **10 Marks**

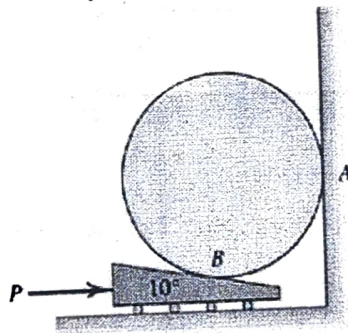


Figure 1

2. Find the least value of P required to cause the system of blocks shown in Figure 2 to have impending motion to the left. The coefficient of friction under each block is 0.20. **10 Marks**

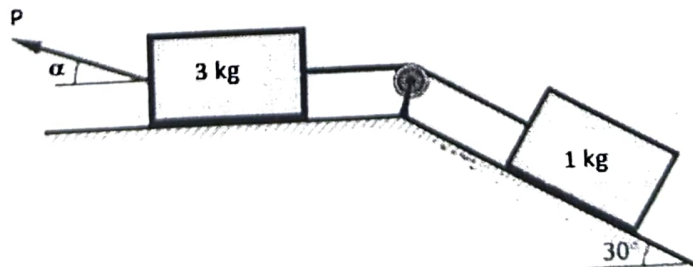


Figure 2

3. Calculate the forces in members BC, BE and EF by method of section for the structure shown in Figure 3. **10 Marks**

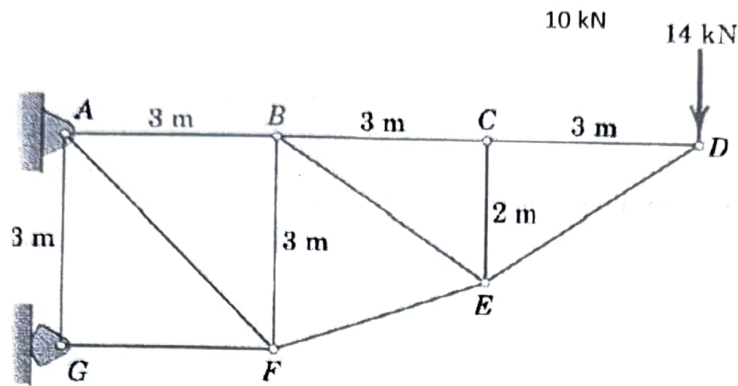


Figure 3

4. Calculate the forces in all members for the structure shown in Figure 4. Find the zero force members in the structure, if any. Neglect any horizontal reactions at supports. **10 Marks**

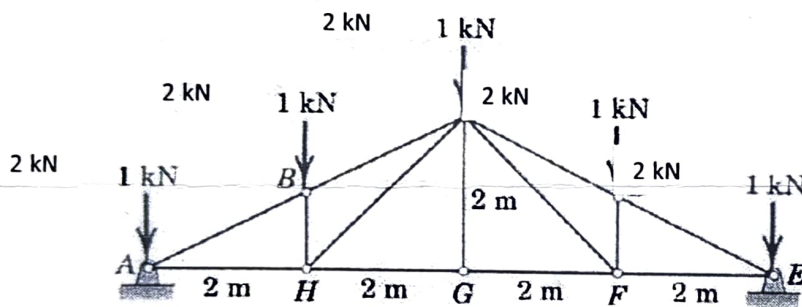


Figure 4

5. Locate the centroid of the composite area shown in Figure 5. **10 Marks**

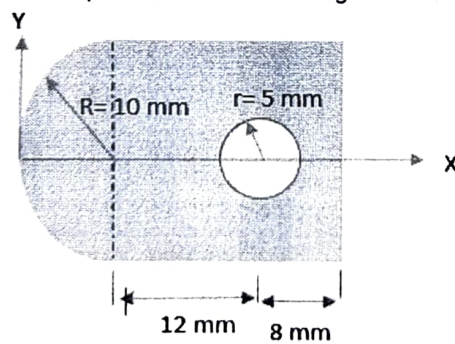


Figure 5