



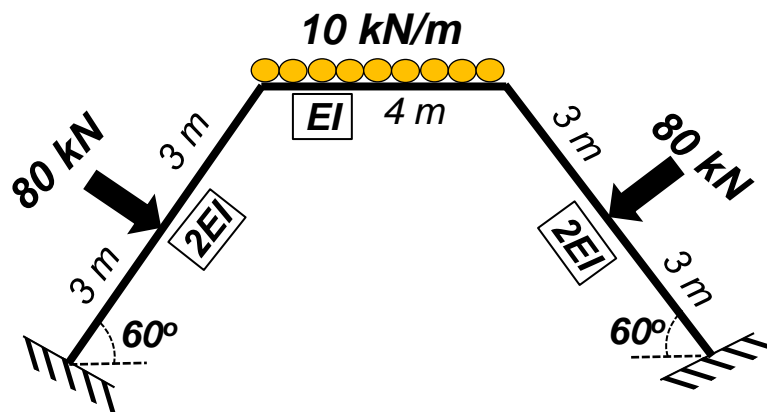
**MINOR EXAMINATION**  
**STRUCTURAL ANALYSIS-II (CVL341)**  
**DEPARTMENT OF CIVIL ENGINEERING**

September 20, 2021  
Time: 9:00-10:30 AM  
Full Mark: 100

**Instructions:**

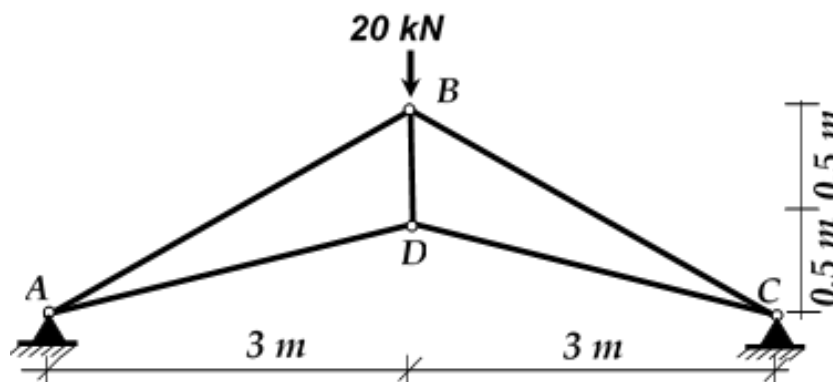
- Start your solution of a problem on a fresh page.
- Upload your solutions as a single PDF document on Moodle.
- Time allowed includes the time required for uploading as well. So, plan accordingly.
- No offline submissions after the allotted time would be considered.

**Q#1:** Using *Slope-Deflection method*, compute the support reactions and the joint moments of the frame shown in Figure 1. Draw the bending moment and the shear force diagrams. (50 Marks)



(Figure 1)

**Q#2:** Using *Method of Consistent Deformations*, determine the support reactions and the member forces of the truss shown in Figure 2. The truss is subjected to a concentrated load of 20 kN at joint **B**. In addition, the member **AD** is too long by 1.5 mm and all the members are subjected to an increase in temperature of 20 °C. Cross-sectional area of member **BD** is 100 mm<sup>2</sup>, whereas the cross-sectional area of all other members is 300 mm<sup>2</sup>. The Modulus of Elasticity,  $E = 205 \text{ GPa}$  and Coefficient of thermal expansion,  $\alpha = 12 \times 10^{-6} / ^\circ\text{C}$ . (50 Marks)



(Figure 2)