

Allowed Tables and Charts: (None)

Read carefully the given data and solve all questions. (Total Marks: 120)

Question (1)

[30M]

For the structure shown in Figure (1), use Consistent Deformation method to calculate unknown reactions and draw the final BMD. (Please define the terms δ)

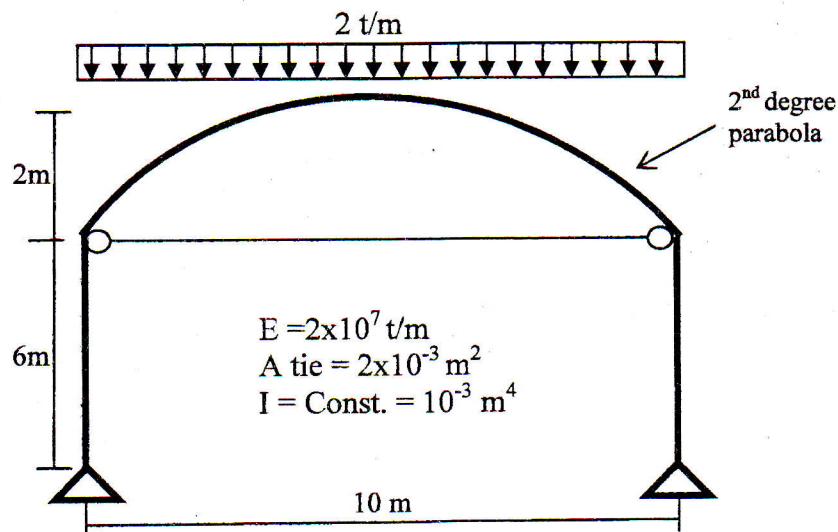


Figure (1)

Question (2)

[30M]

Use Slope Deflection method to solve the structure shown in Figure (2) due to the given

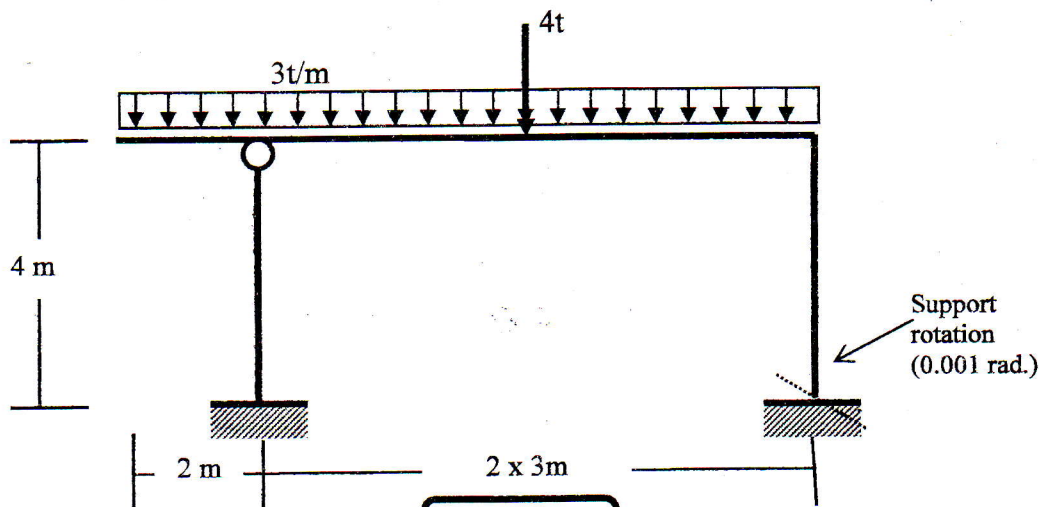


Figure (2)

loads and 0.001 rad. rotation at the fixed support in the shown direction, and then draw the BMD and draw the deformed shape. ($EI = 8000 \text{ tm}^2$)

Question (3)

[30M]

Analyze the beam shown in **Figure (3)** by **Moment Distribution** method, Draw the BMD and find the free body diagram.

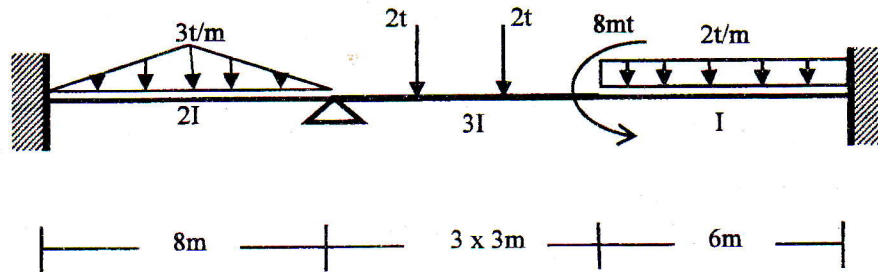


Figure (3)

Question (4)

[30M]

For the truss shown in **Figure (4)**, Use **Direct Stiffness** method to determine all joint displacements, reactions and bar forces. Assume axial rigidity EA to be constant for all members.

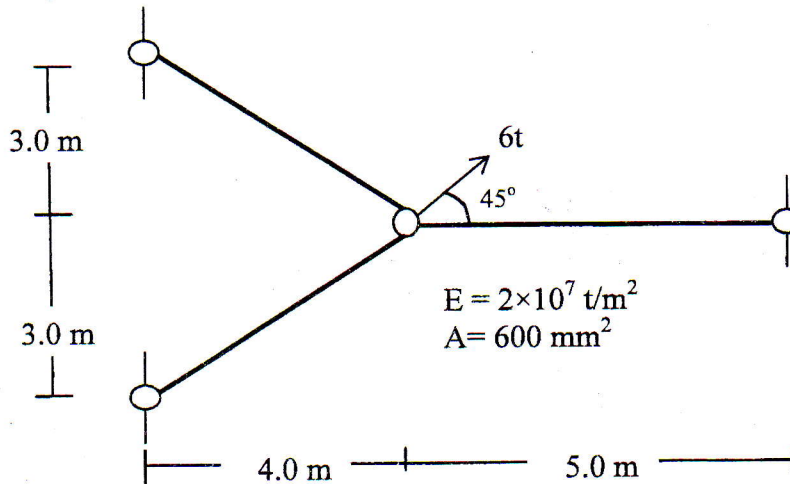
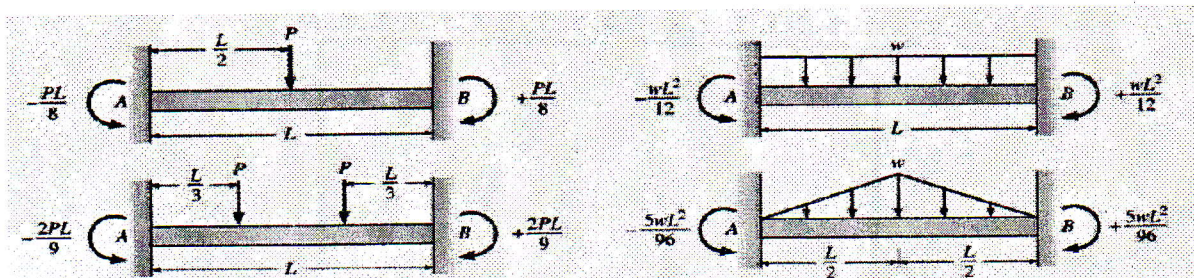


Figure (4)



This exam measures the following ILOs

Question Number	Q1	Q2	Q4	Q2	Q3	Q4	Q3			
	a-5-1	a-11-1	a-1-2	b-2-1	b-2-2	b-11-2	c-6-3			
Skills	Knowledge & Understanding Skills			Intellectual Skills			Professional Skills			