

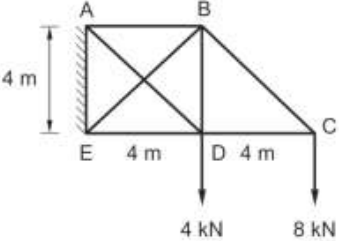
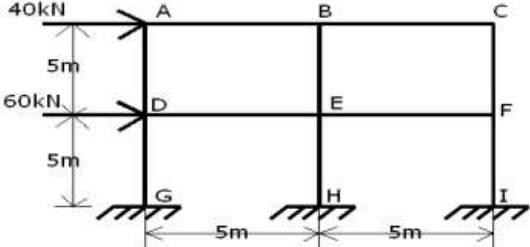
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
III B.Tech II Semester Supplementary Examinations, November-2025
ADVANCED STRUCTURAL ANALYSIS
 (Civil Engineering)

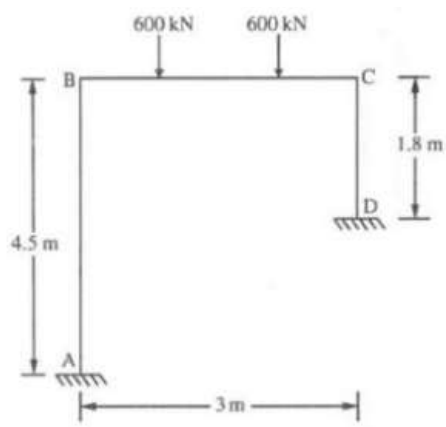
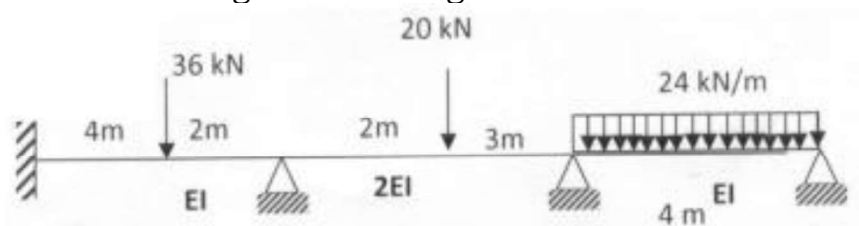
Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I			
1.	A beam of 4m length is simply supported at the ends and carries a uniformly distributed load of 6kN/m length. Find the strain energy and hence deflection. Take $E=200\text{GPa}$ and $I=1440\text{cm}^4$. Use Strain energy method.	[14M]	
	(OR)		
2.	Find the forces in the members of the truss shown in Fig. The axial rigidities are same for all the members.	[14M]	
			
UNIT-II			
3.	A three hinged parabolic arch has supports at different levels having span 20m and carries a UDL of 30kN/m over the left half of the span. The left support is 5m below the crown and the right support is 4m below the crown. Draw the BMD. Also analyze and find the normal thrust and radial shear at a section 4m from the left support.	[14M]	
	(OR)		
4.	Formulate the expression for horizontal thrust in a two hinged semi-circular arch of radius R, carrying a point load W at the crown.	[14M]	
UNIT-III			
5.	Analysis the frame shown in Fig. by portal method. Calculate the beam moments and column moments. Draw the bending moment diagrams.	[14M]	
			
	(OR)		
6.	a) Explain the cantilever method for analyzing a building frame subjected to horizontal forces.	[7M]	
	b) What are the different types of substitute frames?	[7M]	

		UNIT-IV	
7.		A suspension cable of 75m horizontal span and central dip 6m has a stiffening girder hinged at both ends. The dead load transmitted to the cable including its own weight is 1500kN. The girder carries a live load of 30kN/m uniformly distributed over the left half of the span. Assuming the girder to be rigid, Assess the shear force and bending moment in the girder at 20m from the left support. Also assess the maximum tension in the cable.	[14M]
		(OR)	
8.		A three hinged stiffening girder of a suspension bridge of 100m span subjected to two point loads 10kN each placed at 20m and 40m, respectively from the left hand hinge. Determine the bending moment and shear force in the girder at section 30m from each end. Also determine the maximum tension in the cable which has a central dip of 10m.	[14M]
		UNIT-V	
9.		Analyse the frame by slope deflection method and draw bending moment diagram. 	[14M]
		(OR)	
10.		Analyse the continuous beam shown in Fig. by Kani's method and draw the bending moment diagram. 	[14M]
