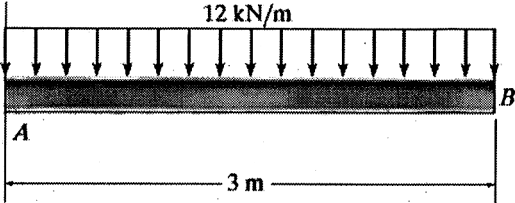
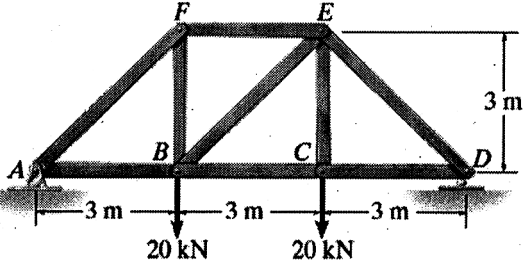
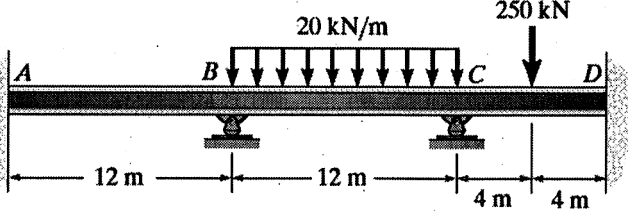


BACHELOR OF ARCHITECTURE SECOND YEAR SECOND SEMESTER EXAM – 2023

THEORY OF STRUCTURES – II

Time: Three Hours

Full Marks 100

Question No.			Marks
<i>Answer ANY FIVE questions. Assume reasonable values of data, if not supplied.</i>			
1.	a.	Discuss Castigliano's theorem with respect to beams and frames.	10
	b.	Determine the displacement of point B of the beam shown in the figure below using Castigliano's theorem. Take $E = 200 \text{ GPa}$, $I = 71.1 \times 10^6 \text{ mm}^4$. <div style="text-align: center; margin-top: 10px;">  </div>	10
2.	a.	Discuss the principle of virtual work with the help of a neat sketch.	5
	b.	Determine the vertical displacement of joint C of the steel truss shown in the figure below. The cross-sectional area of each member, $A = 300 \text{ mm}^2$ and $E = 200 \text{ GPa}$. Use the principle of virtual work. <div style="text-align: center; margin-top: 10px;">  </div>	15
3.	Determine the internal moments at each support of the beam shown in the figure below using the moment distribution method. EI is constant. <div style="text-align: center; margin-top: 10px;">  </div>		20

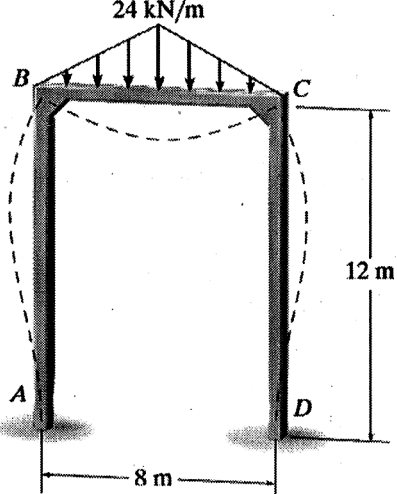
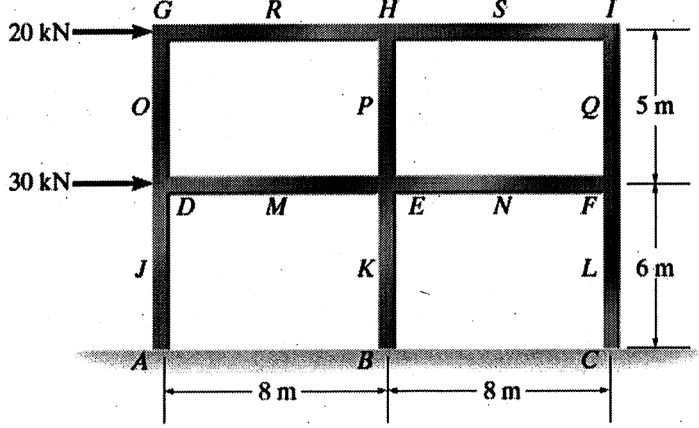
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BACHELOR OF ARCHITECTURE SECOND YEAR SECOND SEMESTER EXAM – 2023

THEORY OF STRUCTURES – II

Time: Three Hours

Full Marks 100

Question No.		Marks
4.	<p>Determine the moments at each joint of the frame shown in the figure below using the slope-deflection equations. EI is constant and no sideways occur.</p> 	20
5.	<p>Determine (approximately) the reactions at the base of the columns of the frame shown in the figure below. Use the portal method of analysis.</p> 	20

BACHELOR OF ARCHITECTURE SECOND YEAR SECOND SEMESTER EXAM – 2023

THEORY OF STRUCTURES – II

Time: Three Hours

Full Marks 100

Question No.		Marks	
6.	a.	What do you understand by statically indeterminate structures? Outline the force and displacement methods of analysis for statically indeterminate structures.	2+3
	b.	Describe the general procedure for determining the reactions of statically indeterminate structures using the force or flexibility method of analysis.	5
	c.	Determine the reaction at the roller support B of the beam shown in the figure below. Assume EI is constant. Use the principle of superposition.	10

