PVP 20

Code: 20CE3503

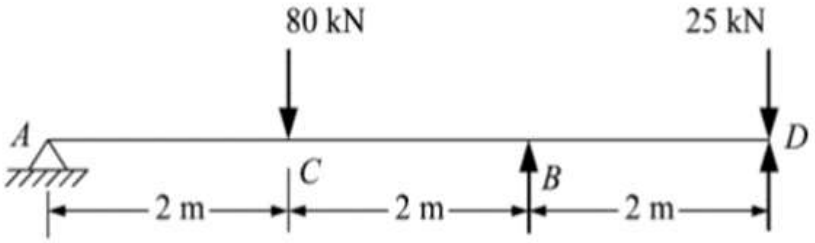
III B.Tech - I Semester – Regular Examinations - DECEMBER 2022

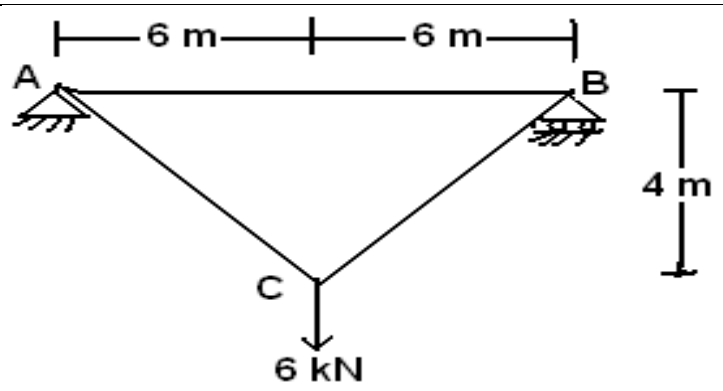
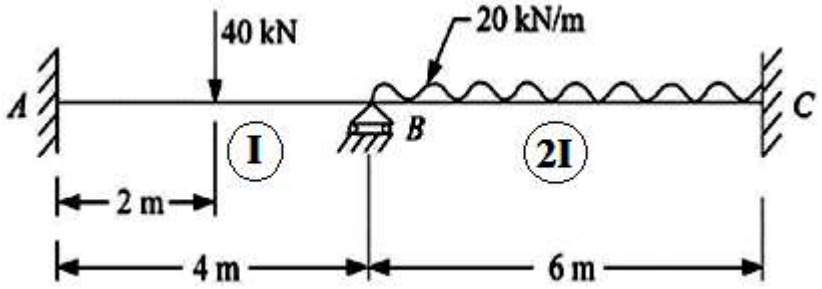
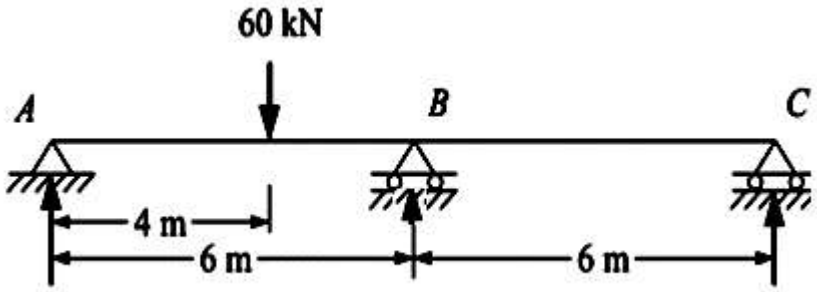
STRUCTURAL ANALYSIS
(CIVIL ENGINEERING)

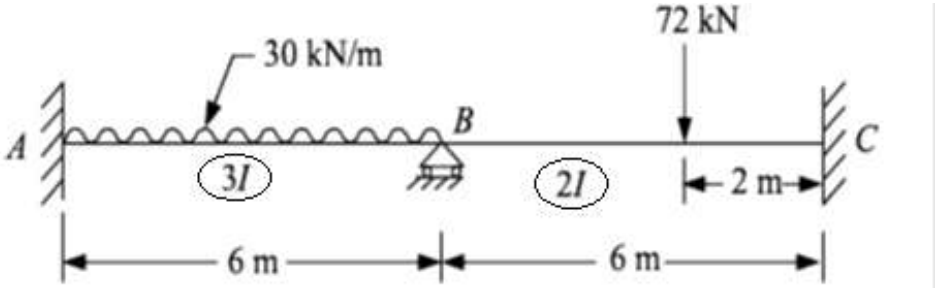
Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
		UNIT-I			
1		Determine the slope and deflection at the end of the beam shown in figure. EI is constant throughout the beam. 	L4	CO1	14 M
		OR			
2		Determine the vertical and horizontal displacements of the point C of the pin jointed frame shown in figure. The cross sectional area of AB is 125 square mm and of AC and BC are 175 square mm each. E = 2 x 10^5 N per square mm.	L4	CO1	14 M

				
	UNIT-II			
3	Analyze the two span continuous beam as shown in figure by slope deflection method and draw bending moment, shear force diagram. (Young's modulus is the same throughout the beam). 	L4	CO2	14 M
	OR			
4	Analyze the continuous beam for developing shear force and bending moment as shown in figure. Flexural rigidity is constant throughout the beam. 	L4	CO2	14 M

	UNIT-III			
5	Using moment distribution method, analyze the 2-span continuous beam ABC, having end supports A and C fixed. There is a load of 5 kN in span AB = 5 m at 3 m from A, while on span BC = 5m, there is a load of 8 kN at 2.5 m from C. Sketch the B.M.D	L4	CO3	14 M
	OR			
6	Analyze the continuous beam shown in figure by Kani's Method. And draw bending moment and shear force diagrams. (E is same throughout) 	L4	CO3	14 M
	UNIT-IV			
7	A built-up I section has overall depth of 400 mm, width of flanges 300 mm, thickness of flanges 50 mm and web thickness 30 mm. It is used as a beam with simply supported ends and it deflects by 10 mm when subjected to a load of 40 kN/m length. Find the safe load if this I – section is used as a column with both ends are hinged. Use Euler's formulae. Assume a factor of safety 1.75 and take E = 2 x 10^5 N/mm^2	L5	CO4	14 M
	OR			

8	A short column of external diameter 40 cm and internal diameter 20 cm carries an eccentric load of 80 kN. Find the greatest eccentricity which the load can have without producing tension on the cross – section.	L4	CO4	14 M
	UNIT-V			
9	A cylindrical shell is 3 m long, and is having 1 m internal diameter and 15 mm thickness. Calculate the changes in the dimensions of the shell, i) Change in diameter ii) Change in length iii) Change in volume. If it is subjected to an internal fluid pressure of 1.5 N/mm^2. Take E = 200 GPa, Poisson's ratio =0.25.	L4	CO5	14 M
	OR			
10	A thick pipe of 300 mm outer diameter and 200 mm internal diameter is subjected to an internal pressure of 12 MPa. What minimum external pressure can be applied so that the tensile stress in the metal shall not exceed 16 MPa? Take E = 200 GPa, Poisson's ratio = 0.25.	L5	CO5	14 M