U.S.N.										

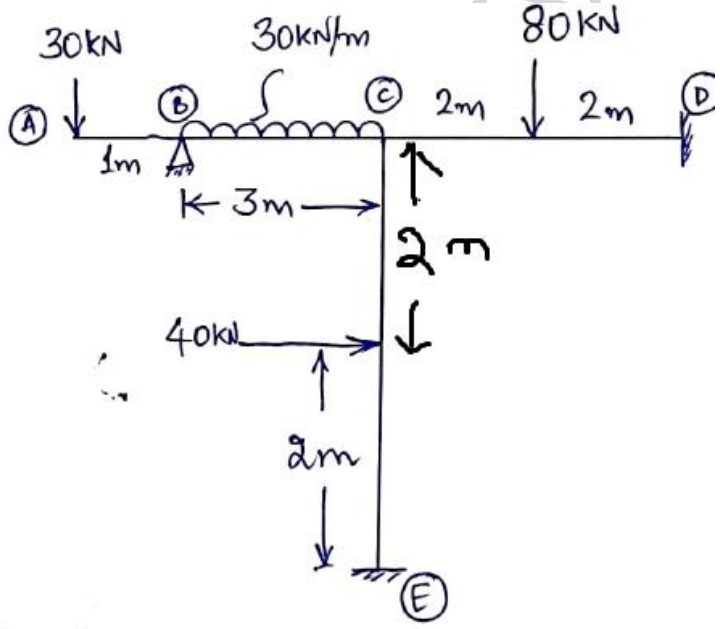
B.M.S. College of Engineering, Bengaluru-560019

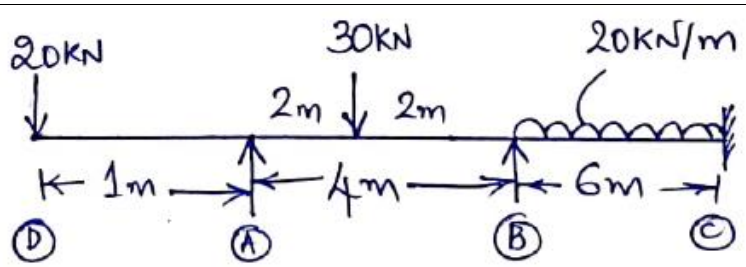
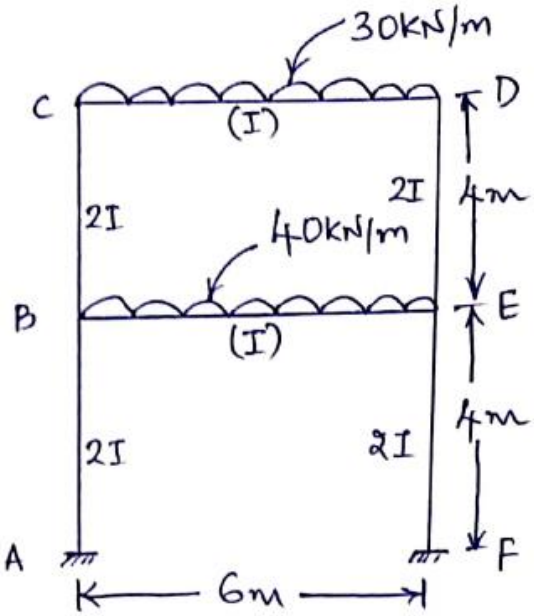
Autonomous Institute Affiliated to VTU

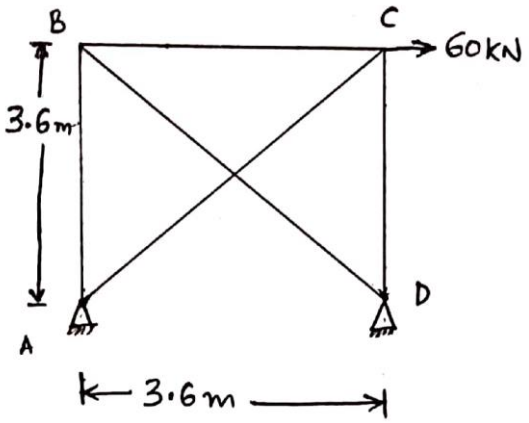
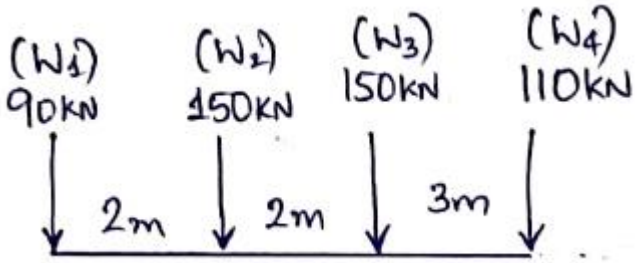
September / October 2024 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Civil Engineering **Duration: 3 hrs.**
Course Code: 20CV5PCISA **Max Marks: 100**
Course: Indeterminate Structural Analysis

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

		UNIT - I	CO	PO	Marks
1		Analyze the rigid portal frame shown in Fig.Q.1 using slope deflection method. Also sketch bending moment diagram. Assume EI is constant.  Fig. Q.1	1	1,2,3	20
		UNIT - II			
2	a)	Analyze the continuous beam by moment distribution method as shown in the figure Q.2. The support 'B' sinks by 10 mm. Take EI = 4,000 kN-m^2. Draw shear force and bending moment diagrams.	1	1,2,3	20

			 Fig. Q.2			
			UNIT - III			
	3		Analyze the rigid portal frame shown in figure Q.3 by taking the advantage of symmetry using Kani's rotation contribution method. Also draw bending moment diagram.  Fig. Q.3	***2***	***1,2,3***	**20**
			UNIT - IV			
	4		A parabolic arch, hinged at the springings, of span 18 m and rise 6m is loaded with 20 kN/m over the left half span, assuming secant variation of its sectional moment of area. Determine the following – (i). The reactions at supports and horizontal thrust, (ii). The position and value of maximum positive BM, calculate normal thrust and radial shear at that section, (iii). Determine the position and value of maximum negative BM. (iv). Calculate BM at the crown and draw BMD.	***3***	***1,2,3***	**20**
			OR			
	5		Determine the forces in the members of the truss as shown in Fig. Q.4. AE is constant for all members.	***3***	***1,2,3***	**20**

			 Fig. Q.4			
			UNIT – V			
	6	a)	Explain the following terms – (i). Rolling loads (ii). Influence line diagrams (iii). Equivalent uniformly distributed load (EUDL)	***4***	***1,2,3***	**06**
		b)	A UDL of 1kN/m run 6m long crosses a girder of span 16m. Construct the maximum SF and BM diagram and calculate values at sections 3m, 5m and 8m from left hand support.	***4***	***1,2,3***	**14**
			OR			
	7		For a simply supported beam of 25m, compute the following by the principle of influence line diagrams – (i). Max. BM at 8m from left support (ii). Absolute max. BM and (iii). Max. reaction or Absolute max SF The series of concentrated loads to be taken as rolling load system are as shown in the Fig. Q.7  Figure Q.7	***4***	***1,2,3***	**20**

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