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CBCS SCHEME

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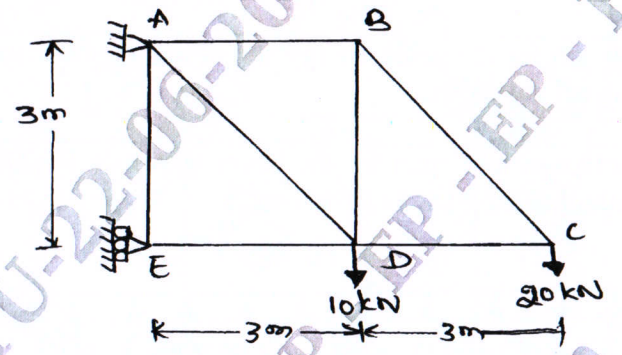
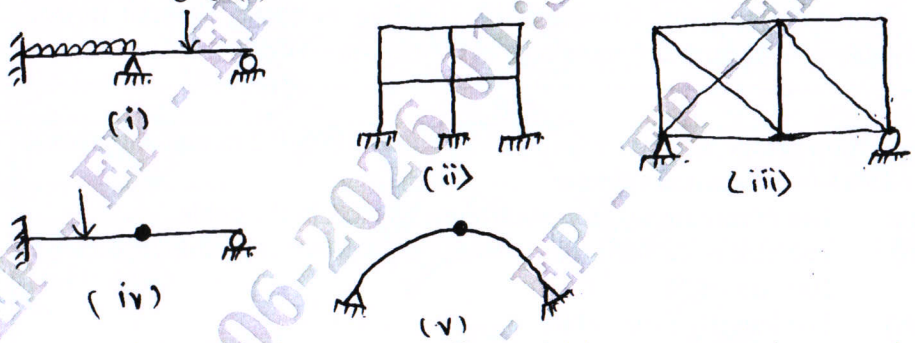
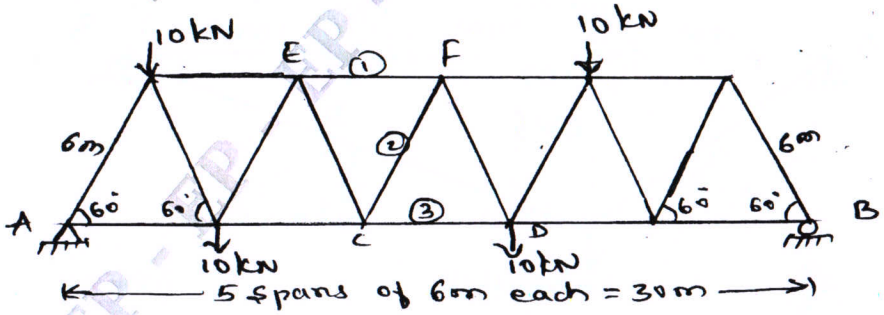
BCV401

Fourth Semester B.E./B.Tech. Degree Examination, June/July 2026
Analysis of Structures

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Analyze the truss shown in Fig.Q1(a) using method of joints. Tabulate the results. Provide necessary check.  Fig.Q1(a)	15	L3	CO1
	b.	State any five assumptions made in the analysis of trusses.	05	L1	CO1
		OR			
Q.2	a.	Determine the static and kinematic indeterminacy of the following structures in Fig.Q2(a).  Fig.Q2(a)	10	L3	CO1
	b.	Find the forces in the numbered members of the loaded truss shown in Fig.Q2(b) using method of section.  Fig.Q2(b)	10	L3	CO1

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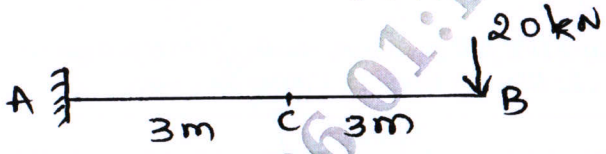
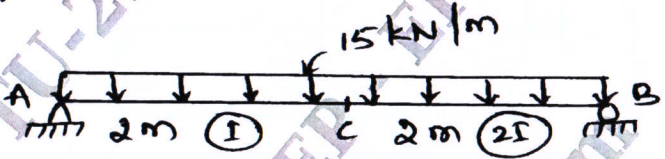
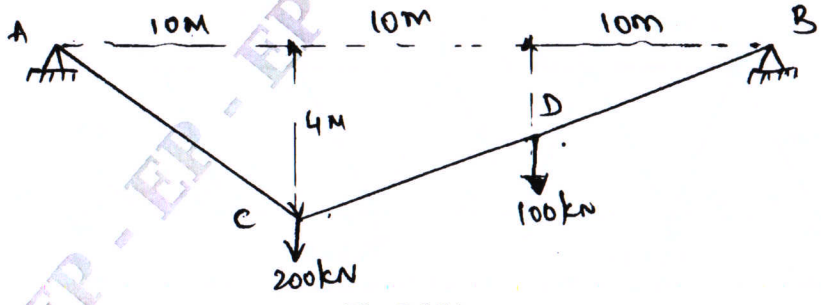
		Module – 2			
Q.3	**a.**	State and derive first and second moment area theorems with neat diagrams with usual notations.	**10**	**L2**	**CO2**
	b.	Apply moment area method to calculate slope and deflection at points 'B' and 'C' of a loaded beam shown in Fig.Q3(b). Take EI = Constant.  Fig.Q3(b)	**10**	**L3**	**CO2**
		OR			
Q.4	**a.**	Derive the expression for the strain energy stored in a member subjected to axial force with usual notations.	**08**	**L2**	**CO2**
	b.	Determine deflection at mid span for the beam shown in Fig.Q4(b) using strain energy method. Take EI = 3×10^4 kN-m^2.  Fig.Q4(b)	**12**	**L3**	**CO2**
		Module – 3			
Q.5		A three hinged symmetrical parabolic arch has a span of 30 m and a centre rise of 6 m. The arch carries a uniformly distributed load of intensity 30 kN/m over left half portion and a concentrated load of 60 kN at 9 m from right hand support. Compute the Bending moment, Normal thrust, radial shear at 9 m from left hand support. Also draw BMD.	**20**	**L3**	**CO3**
		OR			
Q.6	**a.**	A suspension bridge of 120 m span has a central dip of 12 m and supports a udl of 15 kN/m of span. Evaluate (i) The minimum and the maximum tension in the cable. (ii) The size of cable if the permissible stress of the cable material is 200 N/mm^2. (iii) The length of the cable.	**10**	**L3**	**CO3**
	b.	Determine the tension in the various segments of the cable shown in Fig.Q6(b). Also determine the diameter of the cable required if allowable stress in the cable material is 150 N/mm^2.  Fig.Q6(b)	**10**	**L3**	**CO3**

Module – 4

Q.7		Analyze the continuous beam shown in Fig.Q7 by slope deflection method. Draw Bending moment diagram and Elastic curve.	**20**	**L4**	**CO4**

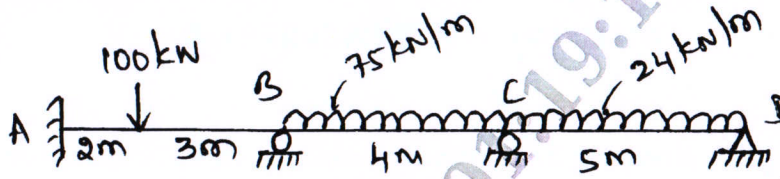


Fig.Q7

OR

Q.8		Analyze the frame shown in Fig.Q8 by Slope-Deflection method. Draw BMD.	**20**	**L4**	**CO4**

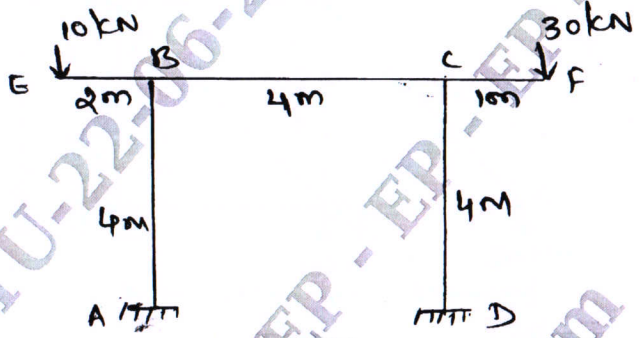


Fig.Q8

Module – 5

Q.9		Analyze the continuous beam shown in Fig.Q9 by moment distribution method. The support 'C' sinks by 9 mm. Take EI = 1×10^{12} N-mm^2.	**20**	**L4**	**CO5**

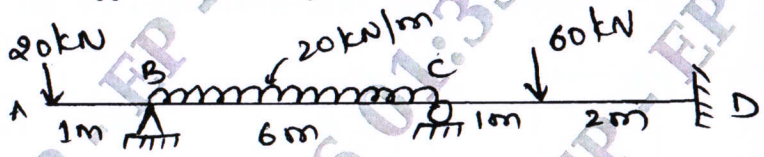


Fig.Q9

OR

Q.10		Analyze the frame shown in Fig.Q10 by moment distribution method. Draw BMD.	**20**	**L4**	**CO5**

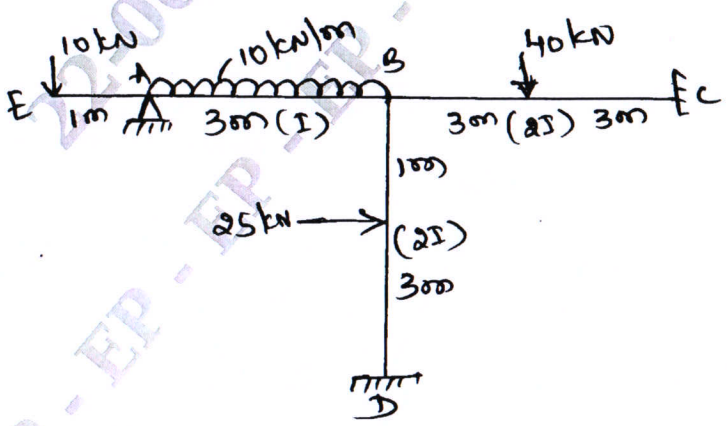


Fig.Q10

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