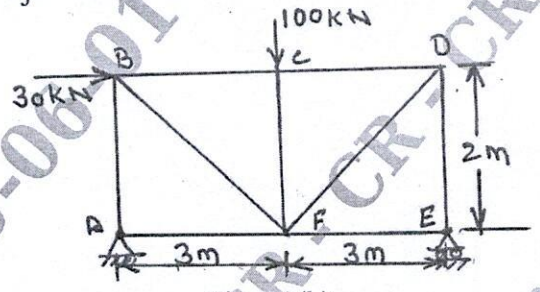
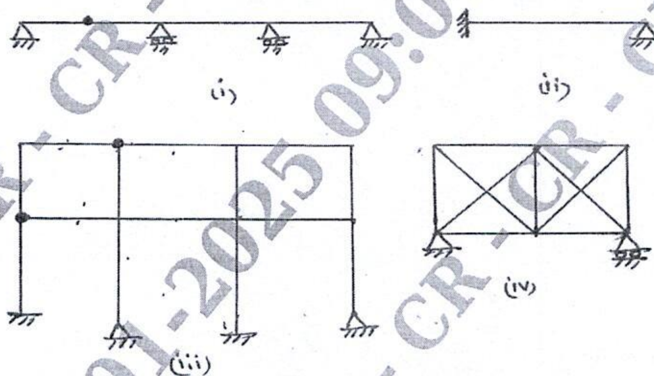
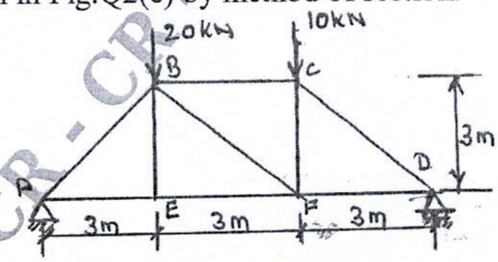
CBCS SCHEME

USN [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] **BCV401**

Fourth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
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.	Differentiate between statically determinate and indeterminate beams with an example for each.	08	L1	CO1
	b.	Determine the forces in all the members of the truss as shown in Fig.Q1(b). Use the method of joints.  Fig.Q1(b)	12	L3	CO1
		OR			
Q.2	a.	Define equilibrium and compatibility conditions.	03	L1	CO1
	b.	Determine static and kinematic indeterminacy for the following shown in Fig.Q2(b).  Fig.Q2(b)	08	L2	CO1
	c.	Determine the support reactions and the forces in members EF, BC and BF for the truss shown in Fig.Q2(c) by method of section.  Fig.Q2(c)	09	L3	CO1

		Module – 2			
Q.3	**a.**	State and explain Mohr's theorems.	**06**	**L1**	**CO2**
	b.	Determine the slope and deflection at free end of cantilever by using moment area method. [Refer Fig.Q3(b)]	**14**	**L3**	**CO2**

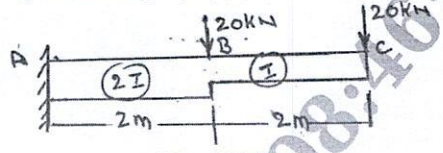


Fig.Q3(b)

OR

Q.4	**a.**	Derive the expression for strain energy due to bending.	**08**	**L1**	**CO2**
	b.	Determine the horizontal and vertical deflection at the free end of bracket shown in Fig.Q4(b).	**12**	**L3**	**CO2**

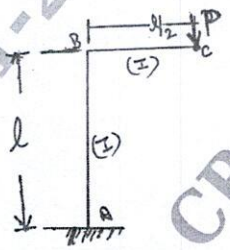


Fig.Q4(b)

		Module – 3			
Q.5	**a.**	Show that the parabolic shape is a funicular shape for a three hinged arch subjected to UDL over its entire span.	**08**	**L2**	**CO3**
	b.	A three hinged parabolic arch of span 20 m and a central rise of 5 m carry a point load of 200 kN at 6 m from the left support. Find the support reactions at A and B. Calculate normal thrust and radial shear at 6 m from the left support. Also draw the BMD. Refer Fig.Q5(b).	**12**	**L3**	**CO3**

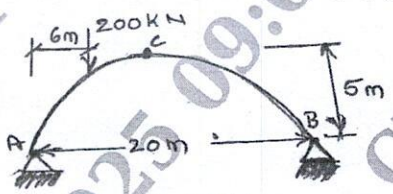


Fig.Q5(b)

OR

Q.6	**a.**	Derive the equation for cable profile and tension in the cable when it is supported at the same level and subjected to horizontal UDL.	**08**	**L2**	**CO3**
	b.	A cable of span 120 m and central dip 4 m carries a UDL of 20 kN/m. Determine (i) The maximum and minimum tension in the cable and its inclination (ii) Length of cable (iii) The size of cable if the permissible stress is 200 N/mm^2.	**12**	**L3**	**CO3**
		Module – 4			
Q.7		Analyze the continuous beam shown in Fig.Q7 by slope deflection method. Draw BMD and SFD.	**20**	**L2**	**CO1**

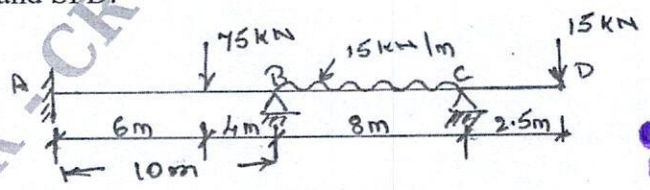
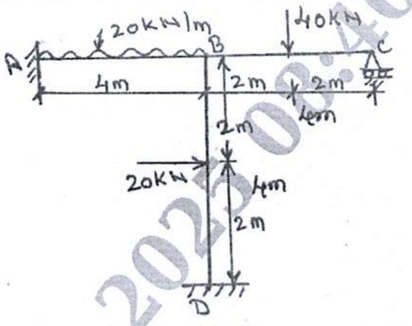
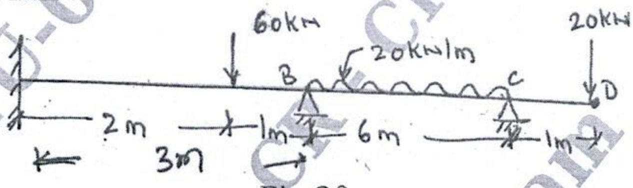
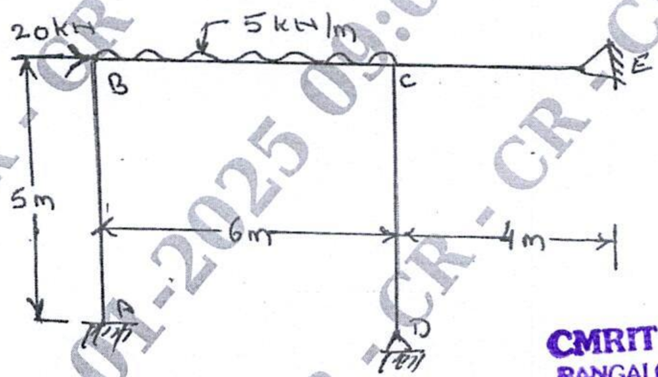


Fig.Q7

		OR			
Q.8	**a.**	Explain fixed end moments for different loading and support conditions with relevant diagrams.	**05**	**L1**	**CO4**
	b.	Analyse the given frame as shown in Fig.Q8(b) by slope deflection method. EI is constant for all the members. Draw BMD and Elastic curve.  Fig.Q8(b)	**15**	**L4**	**CO4**
		Module – 5			
Q.9		Analyse the continuous beam as shown in Fig.Q9 by moment distribution method and draw the BM diagram. The support B sinks by 9 mm. Take EI = 1×10^{12} N-mm^2.  Fig.Q9	**20**	**L4**	**CO5**
		OR			
Q.10		Analyse the frame shown in Fig.Q10 by moment distribution method and draw the BMD. Assume EI constant.  Fig.Q10	**20**	**L4**	**CO5**

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