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Course Code

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Fourth Semester B.E. Degree Examinations, July 2026

ANALYSIS OF STRUCTURES

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module.
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO: PI)</u>
MODULE – 1			
1. a.	Define equilibrium and compatibility conditions.	06	(2 :1: 1.2.1)
b.	Analyze the Truss shown in Fig. Q1 (b) using method of Joints. Indicate the forces in the members pictorially and tabulate the results.	14	(3 :1: 2.1.4)

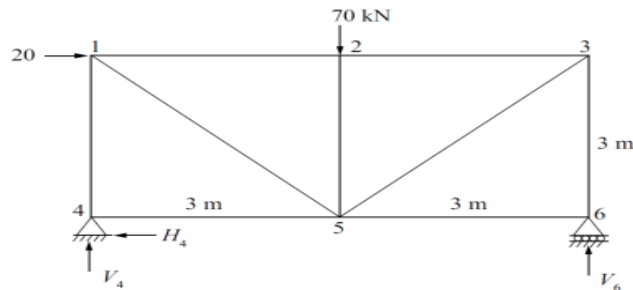


Fig. Q1(b)

(OR)

2. a.	Find the forces in the members ED, EF and FG for the Fan truss shown in Fig. Q 2(a) using method of sections. Sketch appropriate figures by indicating the sectional diagrams.	14	(3 :1: 2.1.4)
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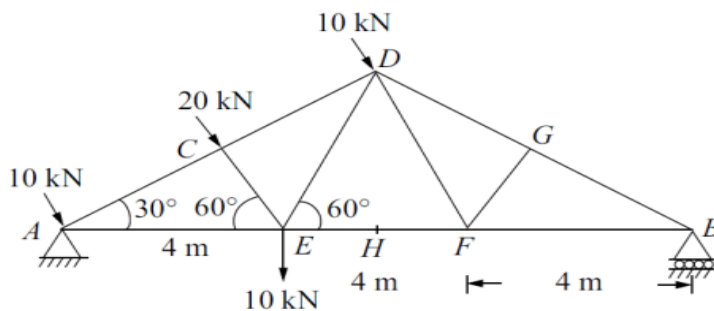


Fig. Q 2(a)

b.	Write short notes on static and kinematic indeterminacies in structures.	06	(2 :1: 1.2.1)
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MODULE – 2

3. a.	Derive the expression for strain energy due to shear force.	10	(3 :2: 2.1.4)
b.	Calculate the maximum slope and deflection of the beam shown in Fig. Q 3(b) by unit load method. Take $EI=15000 \text{ kN/m}^2$.	10	(3 :2: 2.1.4)

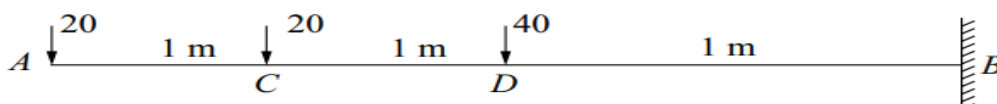


Fig. Q 3(b)

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

(OR)

4. a. Derive the expression for strain energy due to bending. 10 (3 :2: 2.1.4)
- b. Find the slope and deflection at the free end of the beam shown in Fig. Q 4(b) by moment area method. 10 (3 :2: 2.1.4)

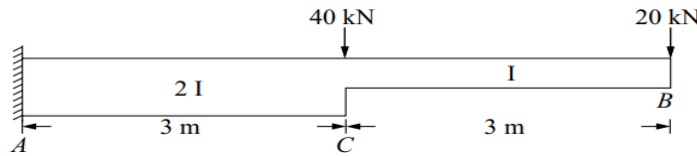


Fig. Q 4(b)

MODULE – 3

5. a. A three hinged parabolic arch is shown in Fig. Q 5 (a). Determine the normal thrust, radial shear and bending moment at quarter span and draw BMD. 14 (2 :3: 2.1.4)

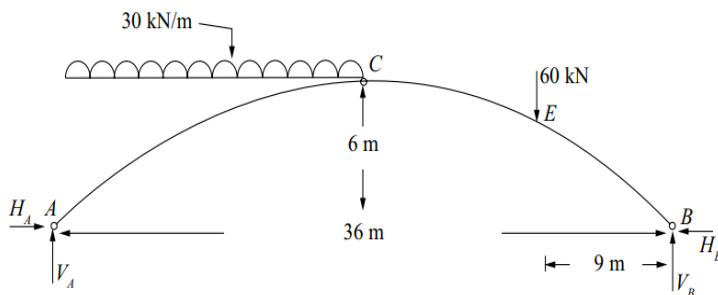


Fig. Q 5(a)

- b. With a neat sketch, explain different types of Arches. 06 (2 :3: 1.2.1)

(OR)

6. A cable as shown in Fig. Q6 is suspended from two points A and B which are 80 m apart. A is 5 m below B. The lowest point on the cable is 10 m below A. The cable supports an udl of intensity 20 kN/m over the entire span. Compute the (i) Reactions at supports (ii) Maximum tension in the cable. 20 (2 :3: 2.1.4)

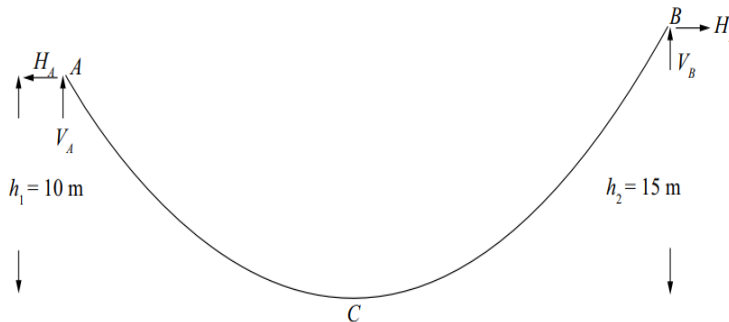


Fig. Q6

MODULE – 4

7. Analyze the continuous beam shown in Fig. Q7 by slope deflection method and draw bending moment, shear force diagram and elastic curve. Consider Young's modulus E to be same throughout the beam. 20 (3 :4: 2.1.4)

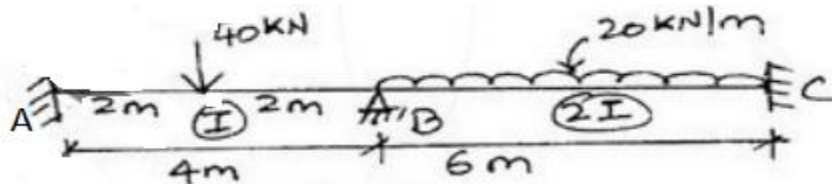


Fig. Q7

(OR)

8. Analyze the frame shown in **Fig. Q8** by slope deflection method and draw bending moment diagram. Take E constant. 20 (3 :4: 2.1.4)

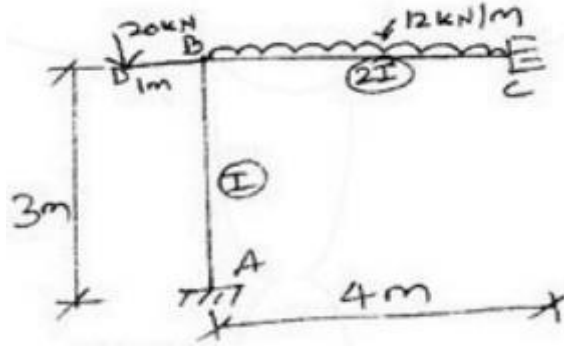


Fig. Q8

MODULE – 5

9. Analyse the continuous beam as shown in **Fig. Q9** by moment distribution method and draw the B.M. diagrams. The support B sinks by 12 mm. Take $E = 2 \times 10^5 \text{ kN/m}^2$ and $I = 120 \times 10^{-6} \text{ m}^4$. 20 (3 :5: 2.1.4)

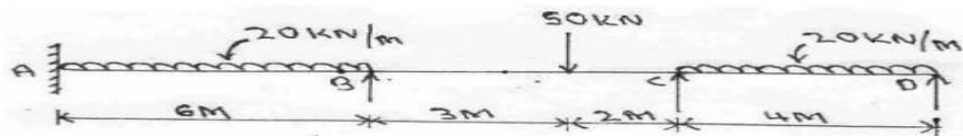


Fig. Q9

(OR)

10. Analysis the frame shown in **Fig. Q10** by moment distribution method and draw BMD assuming EI as constant. 20 (3 :5: 2.1.4)

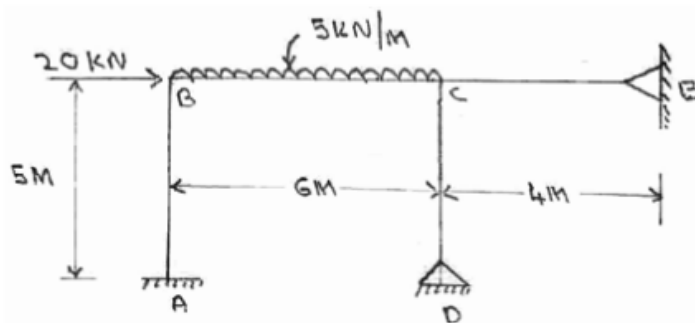


Fig. Q10

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