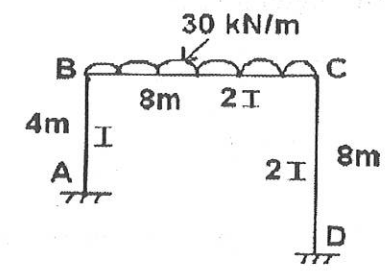
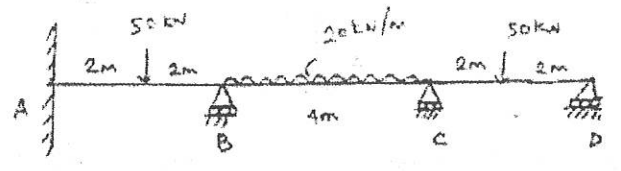


(b) Analyze the frame shown in the following figure by the matrix stiffness method.



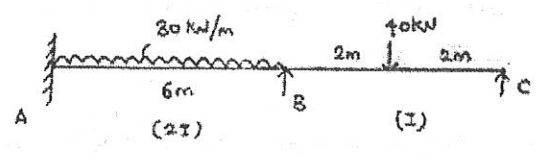
PART C — (1 × 15 = 15 marks)

16. (a) Analyze the continuous beam as shown in fig below by moment distribution method and draw the bending moment and shear force diagram. Support B sinks by 15 mm and support C sinks by 25 mm. Take $E = 200 \text{ GPa}$ and $I = 15000 \text{ cm}^4$.



Or

(b) Analyze the continuous beam as shown in fig below by slope deflection method and draw the bending moment and shear force diagram. Support B sinks by 15 mm. Take $E = 200 \text{ GPa}$ and $I = 15000 \text{ cm}^4$.



Reg. No. :

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Question Paper Code : 70355

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Fifth Semester

Civil Engineering

CE 8502 — STRUCTURAL ANALYSIS – I

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

(Codes/Tables/Charts to be permitted, if any may be indicated) Assume suitable data wherever necessary.

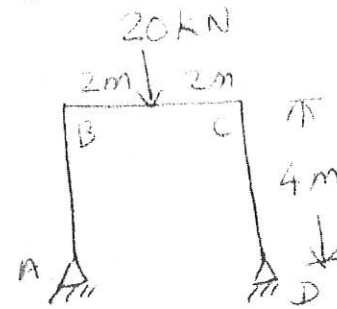
Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define strain energy.
2. Define the term redundancy.
3. Write the assumptions made in the slope deflection method.
4. Write the slope deflection equation for a two span continuous beam.
5. State the advantages of moment distribution method over slope deflection method.
6. Define carryover factor.
7. Write about the term rigid frame.
8. Define static indeterminacy.
9. Write the basic unknowns in stiffness matrix method.
10. Write the basic aim of the stiffness method.

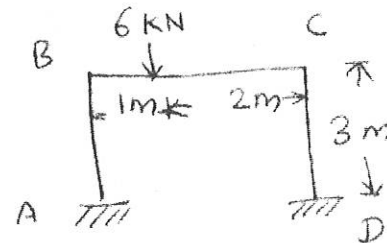
PART B — (5 × 13 = 65 marks)

11. (a) A portal frame ABCD is hinged at A and D and rigid points B and C. The frame is loaded as shown in fig below. Analyze the frame by using the method of strain energy.

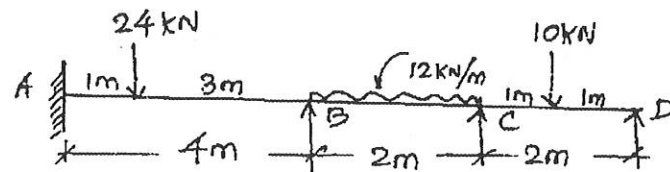


Or

- (b) A portal frame has hinged ends at A and D with stiff joints at B and C. It is shown in figure below. Analyze the frame using strain energy.

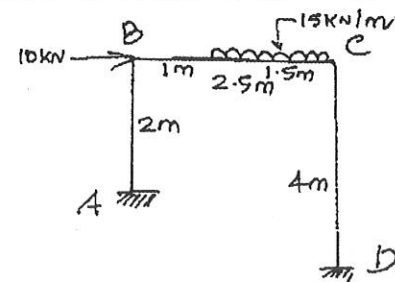


12. (a) Analyze beam loaded as shown in fig below by slope deflection method and draw the bending moment and shear force diagram. Take the value of the Young's modulus as EI throughout the length of the beam.

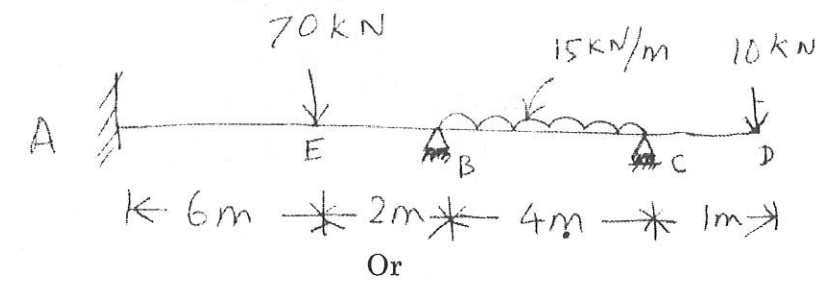


Or

- (b) Analyze a frame as shown in fig below by slope deflection method and draw the bending moment diagram. $I_{AB} = 2I_{BC} = I_{CD} = 2I$.

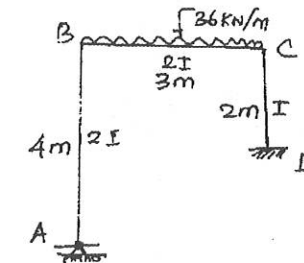


13. (a) Analyze the continuous beam as shown in the figure below by the moment distribution method and draw the bending moment diagram. EI is constant throughout span.

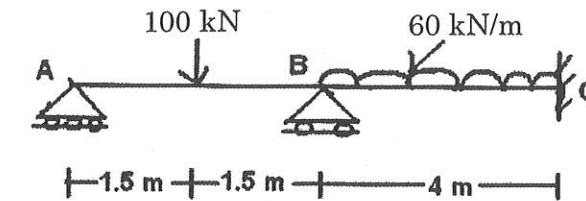


Or

- (b) Analyze a portal frame structure by the moment distribution system as shown in the figure below.

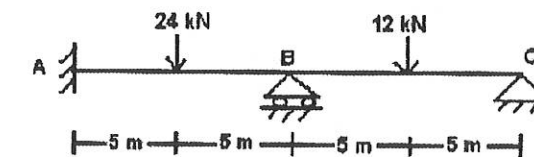


14. (a) Analyze the continuous beam shown in the following figure by the flexible matrix method and draw the bending moment diagram.

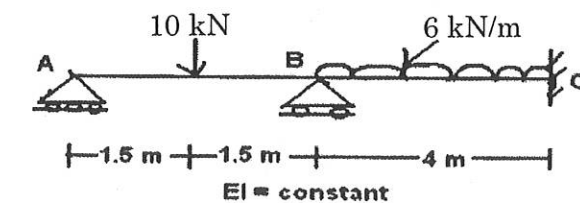


Or

- (b) Analyze the given continuous beam ABC as shown in the figure below by the flexible matrix method and draw the bending moment diagram.



15. (a) Analyze the continuous beam ABC as shown in figure below by using stiffness method and also sketch the bending moment diagram.



Or