



**K. K. Wagh Institute of Engineering Education & Research, Nashik**  
(An Autonomous Institute From A.Y. 2022-23)

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester:IV
Class:SY	Program:B.Tech Civil Engineering
Branch Code:CIV	Pattern:2022
Name of Course:Structural Analysis	Course Code:CIV222011
Max. Marks:60	Duration:2.30 Hrs.

**Instructions:** Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 5 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome

**Question No. 1 Attempt following Question**

- a) Determine the slope and deflection at the point C for a simply supported beam shown in fig. 1 (6) CO1

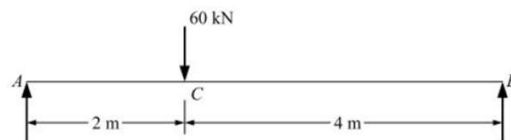


Fig. 1

**Question No. 2 Attempt following Question**

- a) Find only P-forces required for the analysis of the given indeterminate truss shown in fig.2 (6) CO2

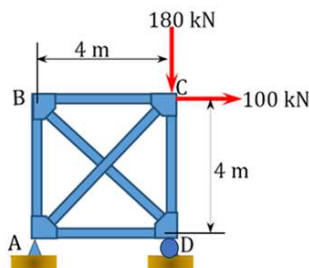


Fig.2

**Question No. 3 Attempt following Question**

- a) Determine end moments at the support of beam as shown in fig 3 a by slope deflection method. Draw BMD. Take EI constant (12) CO3

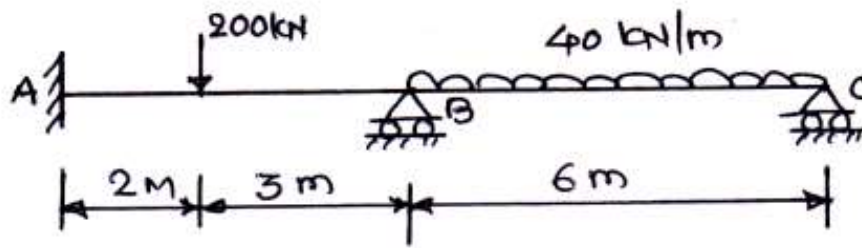


Fig 3 a

OR

- b) Determine end moments of the frame shown in fig 3 b by slope deflection method and Draw BMD. (12) CO3  
Assume uniform flexural rigidity

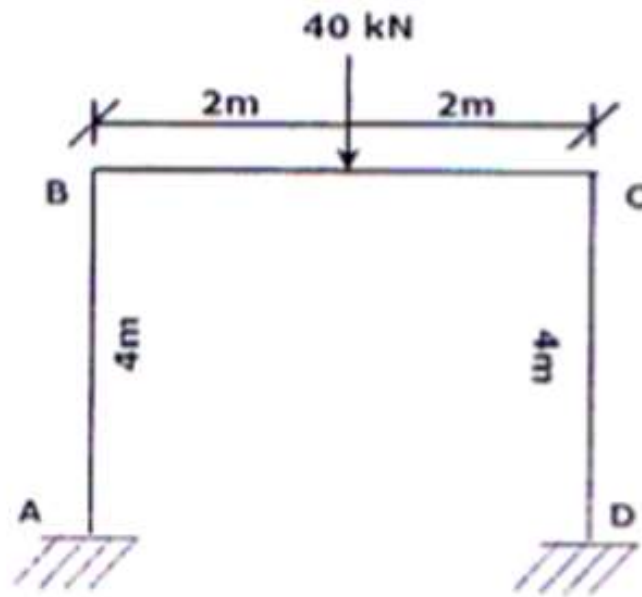


Fig 3 b

- c) Explain carry over theorem, carry over factor. (4) CO3

OR

- d) Write the slope deflection equations for support moment at A, B and c for given frame shown in fig 3 d (4) CO3

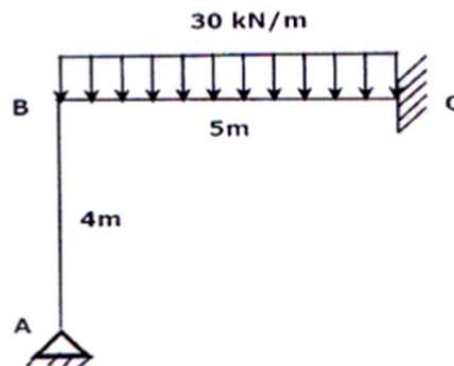


Fig 3 d

- a) Analyse a given beam as shown in fig 4 a by moment distribution method, Draw BMD. Take EI as constant. (12) CO4

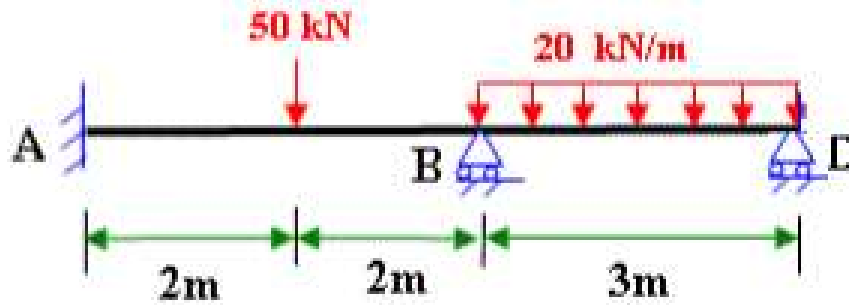


Fig 4 a

OR

- b) Analyse a given portal frame shown in fig 4 b by moment distribution method. Draw BMD and EI is as shown in fig 4 b. (12) CO4

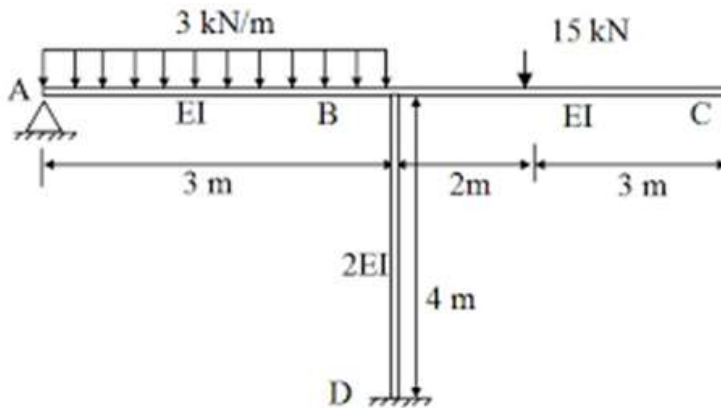


Fig 4 b

- c) Explain distribution factor and calculate it for joint B of given frame shown in fig 4 c (4) CO4

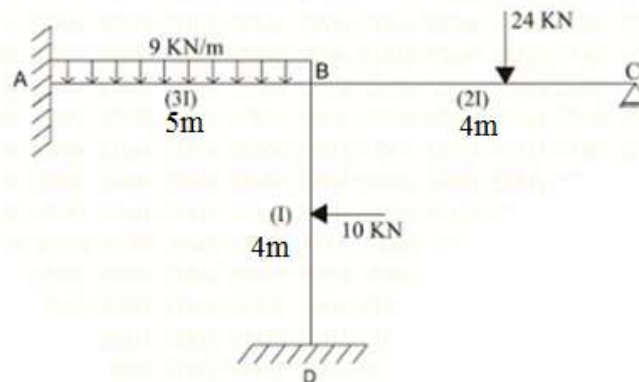


Fig.4c

OR

- d) State distribution theorem and find the distribution factor for joint B of a given continuous beam shown in fig 4 d (4) CO4

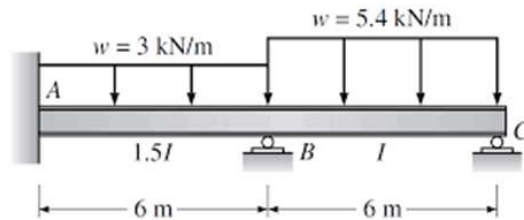


Fig 4 d

**Question No. 5 Attempt following Question**

- a) Analyse beam shown in fig 5 a by stiffness method. Take  $EI$  as constant.

(12) CO5

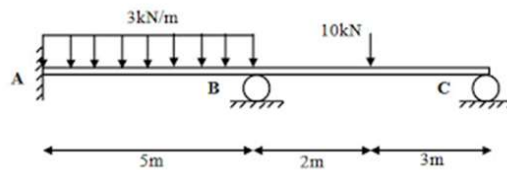


Fig 5 a

**OR**

- b) Analyse a given portal frame as shown in fig 5 b by stiffness method. Take  $EI$  constant

(12) CO5

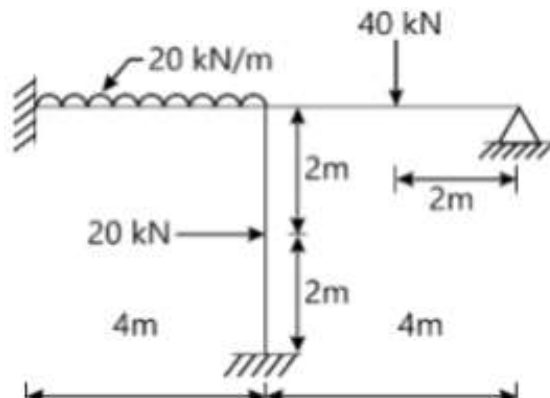


Fig 5 b

- c) Formulate a stiffness matrix for a given continuous beam shown in fig 5 c .

(4) CO5

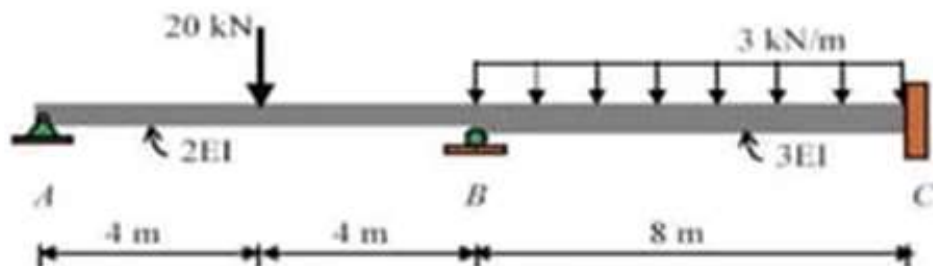


Fig 5 c

**OR**

- d) Formulate the stiffness matrix for portal frame shown in fig. 5 d

(4) CO5

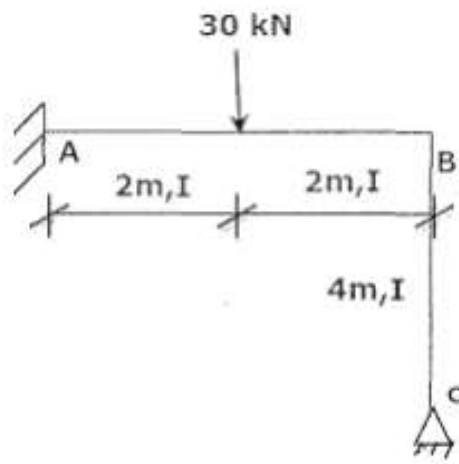


Fig. 5 d

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