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

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:IV
Class:SY	Program:B.Tech
Branch Code:CIV	Pattern:2023
Name of Course:Structural Analysis	Course Code:2304213
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 four 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

Marks CO

Question No. 1

1.a) Analyze propped cantilever beam as shown in fig 1 (6) CO1

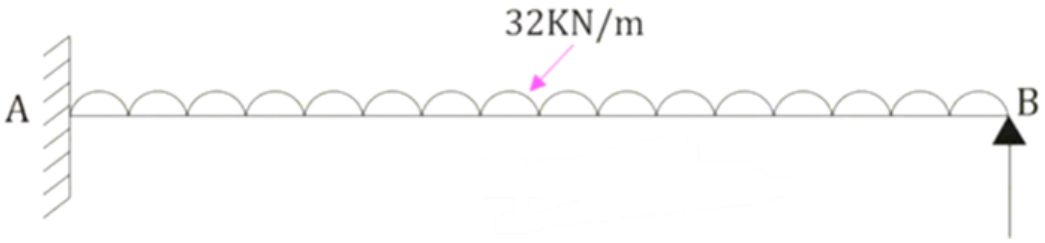

Fig. 1

Question No. 2

2.a) Explain the concept of lack of fit in truss with suitable example (6) CO2

Question No. 3

3.a) Analyze the given beam shown in fig 3 a by slope deflection method and draw BMD. (12) CO3

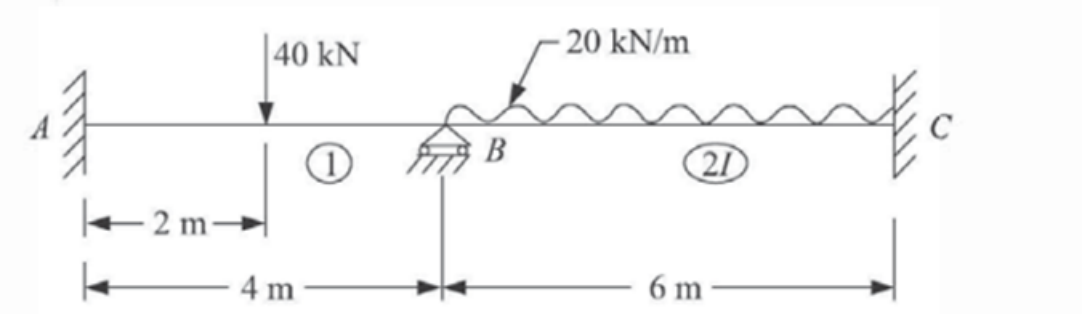

Fig. 3 a

OR

3.b) Find the support moments by slope deflection method for a given portal frame shown in fig 3 b. (12) CO3

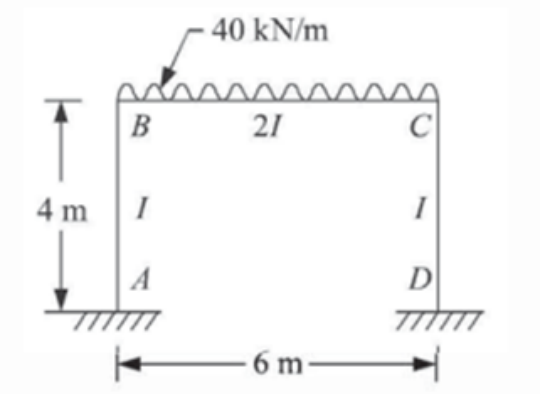

Fig.3 b

3.c) Write only degree of freedom (unknowns) and equilibrium equation to be used for portal frame shown in fig 3 c . (4) CO3

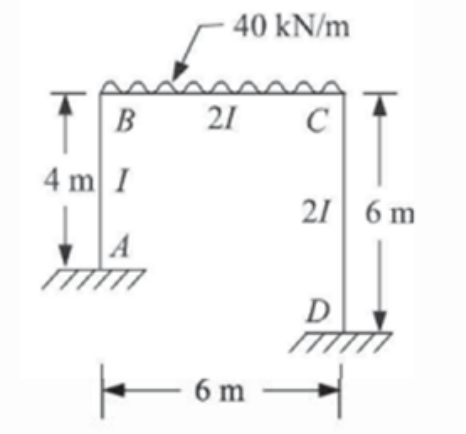

Fig .3 c

OR

3.d) Write only the slope deflection equations for support moment for a given beam shown in fig 3 d. (4) CO3

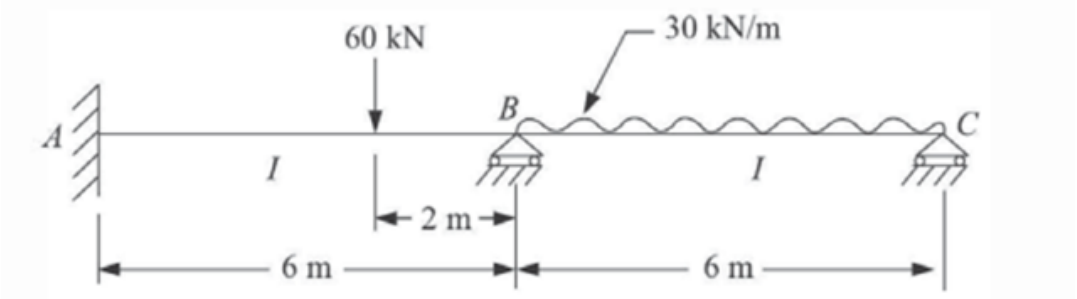

Fig 3 d

Question No. 4

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

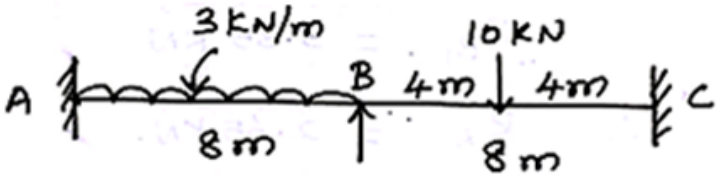

Fig 4 a

OR

4.b) Analyze a given portal frame shown in fig 4b.Draw BMD by moment distribution method. (12) CO4

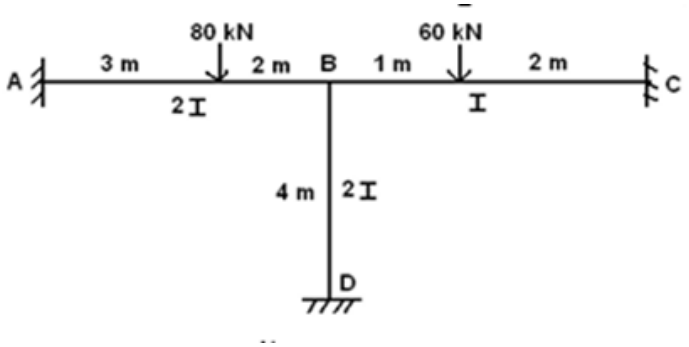

Fig 4b

4.c) Differentiate between distribution factors and carry over factor (4) CO4

OR

4.d) Find the distribution factor for joint B of a given continuous beam shown in fig 4 d. (4) CO4

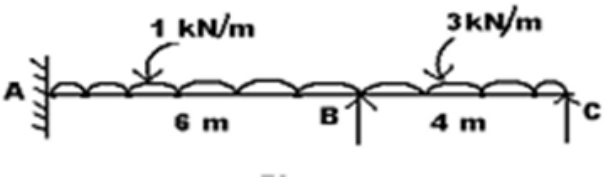

Fig 4 d.

Question No. 5

5.a) Analyze a given beam shown in fig 5 a , Draw BMD by stiffness method. Take EI constant. (12) CO5

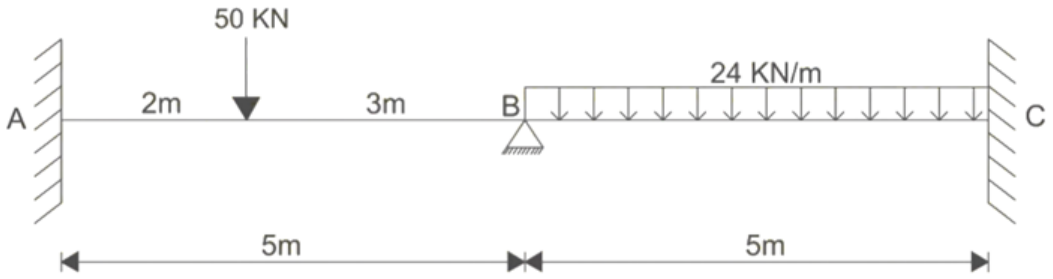

Fig 5 a

OR

5.b) Analyze a given portal frame shown in fig 5b, Draw BMD by stiffness method . (12) CO5

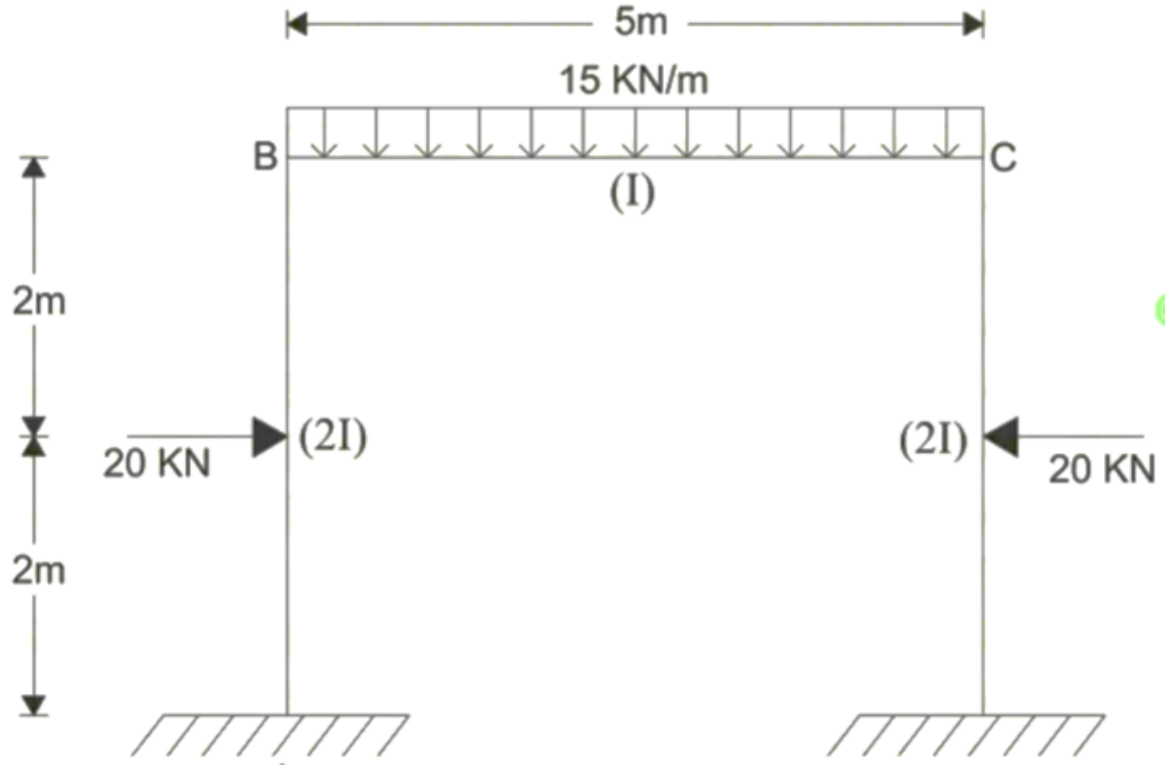

Fig 5b

5.c) Define stiffness coefficient 'kij' and what are the basic unknowns in stiffness matrix method. (4) CO5

OR

5.d) List the properties of the stiffness matrix. (4) CO5

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