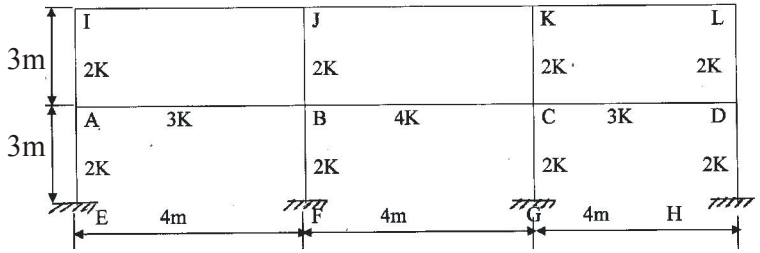
4 kN/m and that of 6 m span beams may be taken as 5 kN/m. Use two cycle moment distribution method. The stiffness of the members is indicated against each member. **15**

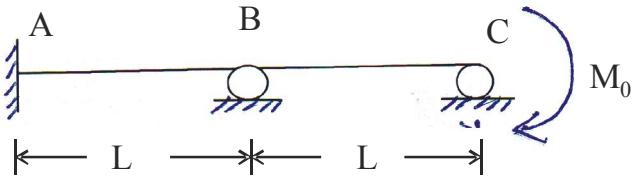


6. Explain in detail the cantilever method with an example. **15**

Section D

7. Derive the stiffness matrix of a typical pin jointed two-dimensional frame element oriented at angle θ to the X-axis. **15**

8. Analyse the frame given below by flexibility matrix approach. **15**



Roll No. ..... **Total Pages : 05**

J-21-0002

B. Tech. EXAMINATION, 2021

Semester V (CBCS)

STRUCTURAL ANALYSIS-II

CE-502

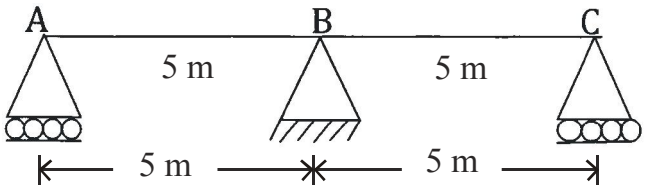
Time : 2 *Hours* *Maximum Marks :* 60

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

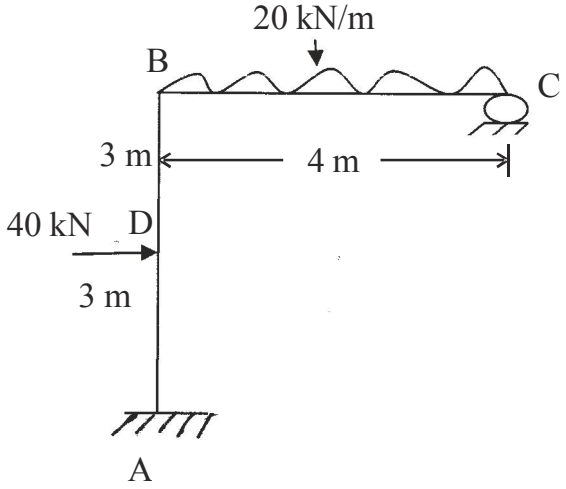
Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. Determine the influence line for reaction at A for the continuous beam shown in figure. Compute the influence line ordinates at 1 m intervals. The moment of inertia is constant throughout. **10**

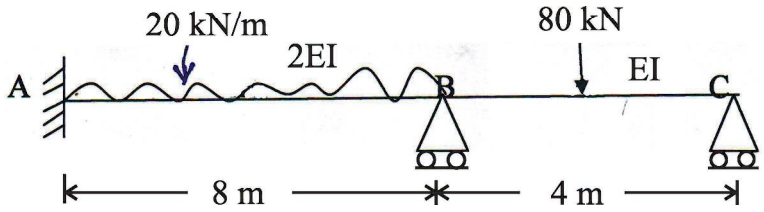


2. Analysis of rigid jointed frame by Castigliano's theorem. The moment of inertia is constant throughout. **15**

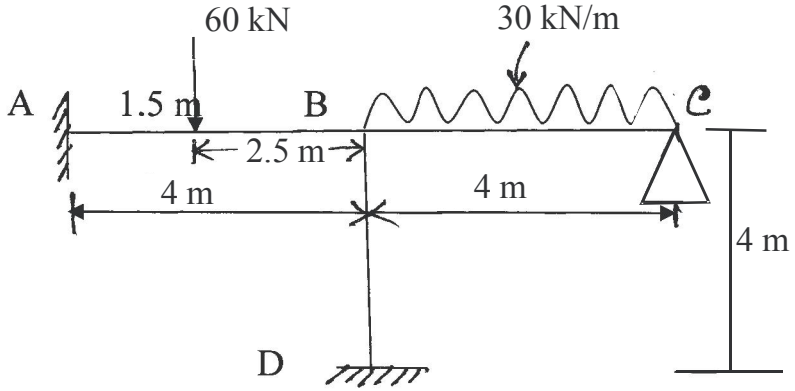


Section B

3. Analyse the continuous beam shown in Fig. by slope deflection method, if joint B sinks by 10 mm. Give EI = 4000 kN/m^2. Draw bending moment and shear force diagrams. **15**



4. Analyse the frame shown in fig. by slope deflection method and draw bending moment diagram. Flexural rigidity (EI) is same for all members. **15**



Section C

5. In a multistoried building, the frames shown in fig. are spaces at 3.5 m intervals. Dead load from the slab is 3 kN/m^2 and live load is 5 kN/m^2. Analyse the beam BC for mid span negative bending moment. Self weight of beams of 4 m span may be taken as

(Compulsory Question)

9. Attempt any *six* questions :

(a) State the assumptions made in deriving slope-deflection equations.

(b) State and explain Castigliano's theorem.

(c) Explain the terms stiffness matrix and flexibility matrix.

(d) State and explain Muller Breslau principle.

(e) Differentiate between element and global stiffness matrices.

(f) Differentiate between influence line diagram and bending moment diagram.

(g) Explain the terms :

(i) Carryover factor

(ii) Distribution factor.

(h) Differentiate between Position vector and Displacement vector. **6×2½=15**

(Compulsory Question)

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