Code No: I8702/R16

M. Tech. I Semester Regular/Supple Examinations, Jan/Feb-2018

MATRIX ANALYSIS OF STRUCTURES

Common to Structural Engineering (87), Structural Design (85)
And Computer Aided Structural Engineering(35)

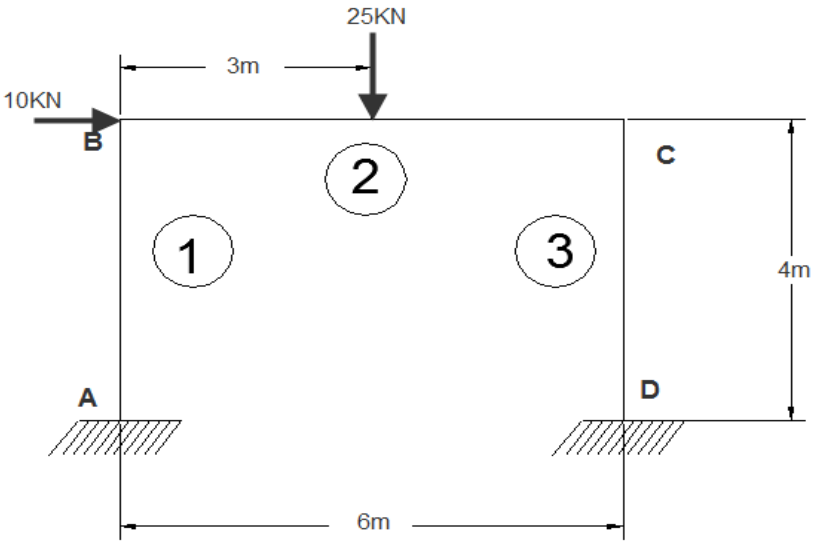
Time: 3 Hours **Max. Marks: 60**

Answer any FIVE Questions
All Questions Carry Equal Marks

1. a) What is meant by degree of static indeterminacy and degree of kinematic indeterminacy of structure? Explain them through examples
b) Compare and contrast the flexibility and stiffness method?

2. a) Generate the force displacement relation F=K U for the given frame shown in Figure neglecting axial deformations. EI is same for all members.

b) Analyze the frame by stiffness method from the above force displacement relation



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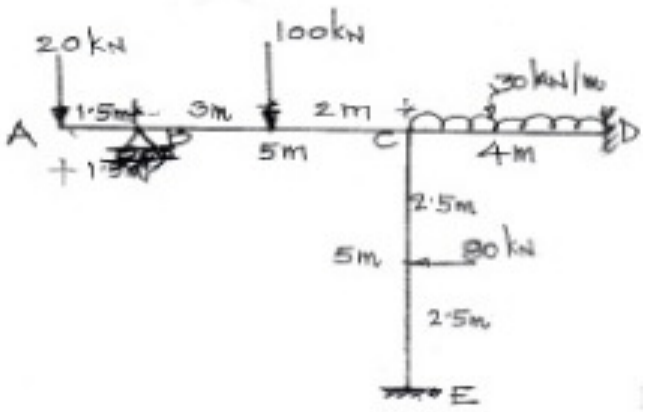
3. Analyze the frame by stiffness metod



4. .Consider the symmetric grid system (plan view) shown in Fig. , with all the elements subjected to uniformly distributed gravity loading of 12 kN/m and having uniform flexural rigidity EI = 27000 kNm^2 and torsional rigidity $GJ = 0.2EI$. Taking advantage of symmetry and adopting any method of your choice, find the deflection at the centre E and draw the bending moment diagram and probable deflected shape of a typical element AE.

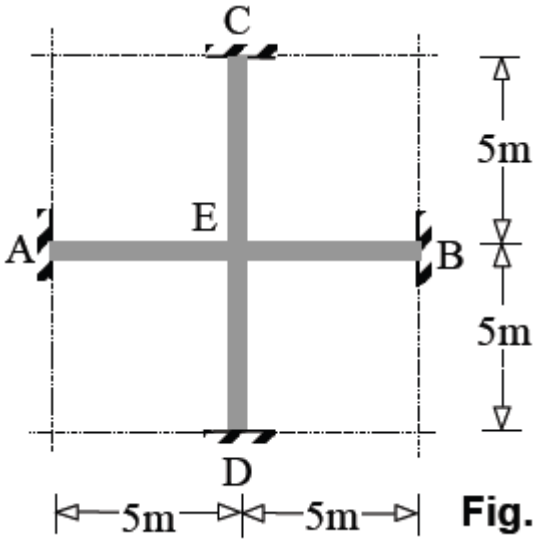
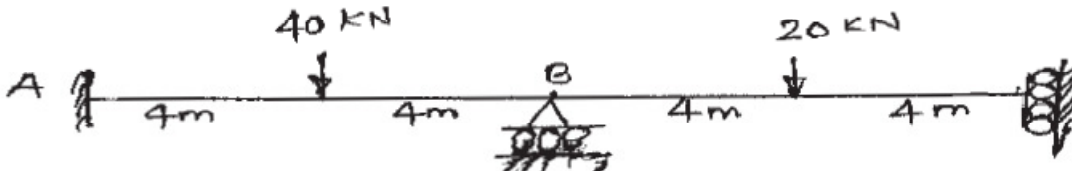


Fig.

5. Derive Element stiffness matrix for Beam element as shown in fig



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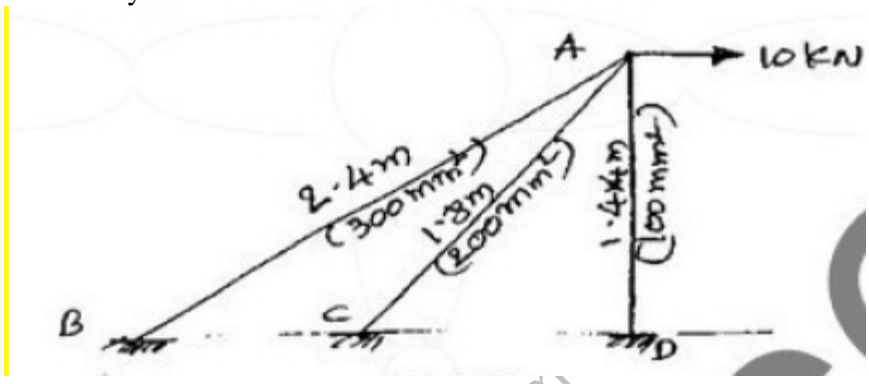
6. Explain

   i) Banded Matrix and Semi Band Width.
   ii) Concept of beam on elastic foundation.
   iii) Method of static condensation
   iv) Method of sub structuring for analysis of large structures

7. a Discuss on inertial and thermal stresses
   b Explain about Beams on elastic foundation by stiffness method

8. Analyze the truss by stiffness method



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