Code No: G8702/R13

M. Tech. I Semester Supplementary Examinations, December-2016

MATRIX ANALYSIS OF STRUCTURES

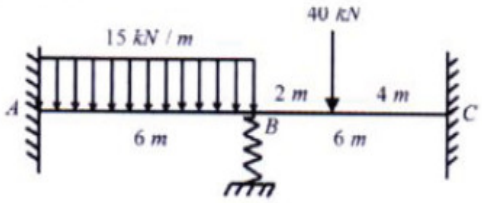
(Common to SE and SD)

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

Answer any FIVE Questions
All Questions Carry Equal Marks

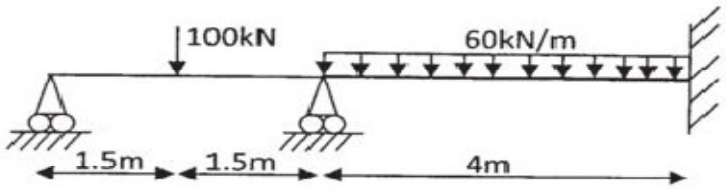
1. Explain the differene between Static indeterminacy and kinematic indeterminacy.
Develop Element stiffness matrix for truss element, beam element and Torsional element

2. Analyze the continuous beam ABC as shown in Figure using stiffness matrix method. The beam is fixed at A and C and supported by spring at B. Take EI constant. Draw BMD.



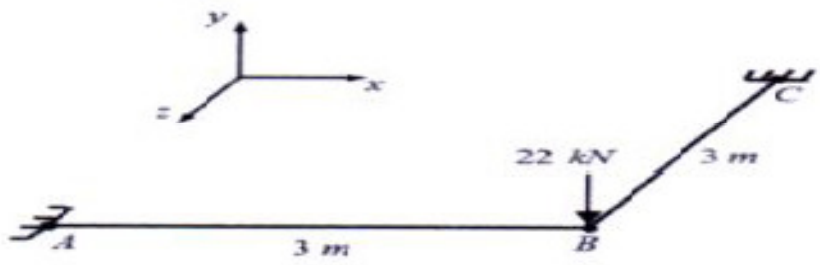
Figure

3. Develop stiffness matrix for the given beam?



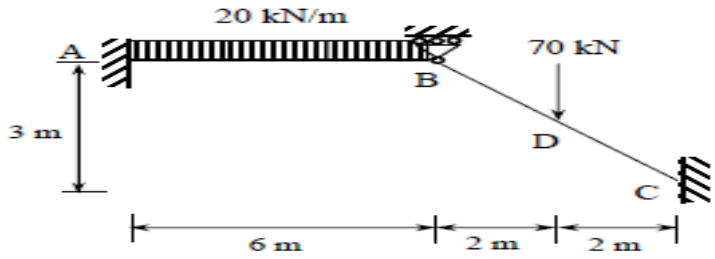
Code No: G8702/R13

4. Analyze the grid structure ABC as shown in Figure using stiffness matrix method. Take E =210 GPa, G = 84 GPa, I = 16.6x10^{-5} m^4, J=4.6 x 10^{-5} m^4 for all elements.



5. a. Construct the rearranged joint stiffness matrix for the plane frame shown in Figure

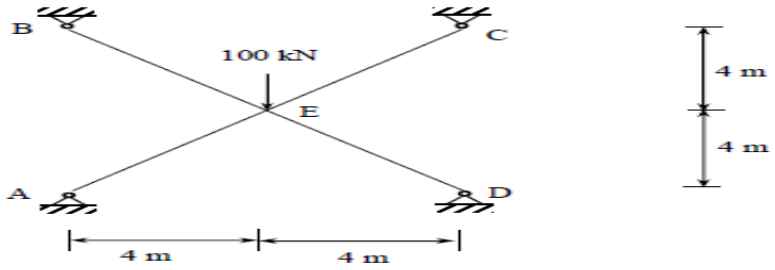
(b) Determine free joint displacements and support reactions for the plane frame shown in Figure using stiffness member approach.



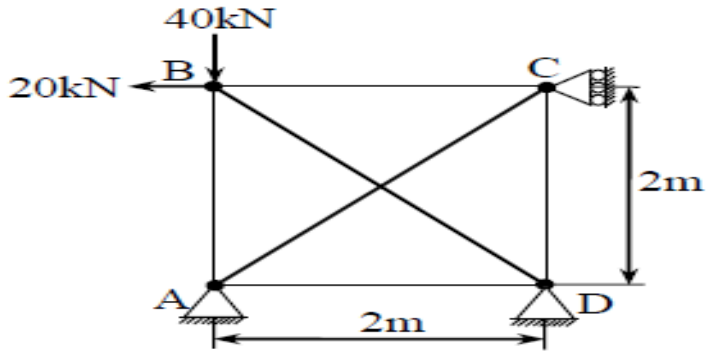
6. a)For the truss shown in Figure , obtain rearranged joint stiffness matrix taking advantage of symmetry.

Code No: G8702/R13

(b) Determine free joint displacements and support reactions for the truss shown in Figure using stiffness member approach.



7. Develop stiffness matrix for a given truss



8. Using first principles, establish relationship between local & global stiffness matrix of portal frame member. State clearly transformation matrix