

M.E. First Semester (Civil (Structural Engg.)) (New-CGS)  
**13086 : Matrix Methods of Structural Analysis : 1 SFSE 3**

P. Pages : 3

Time : Three Hours



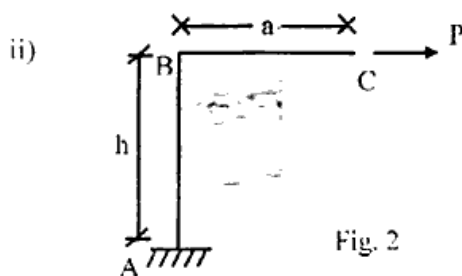
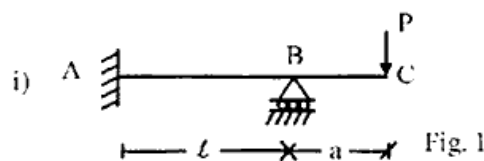
AU - 3446

Max. Marks : 80

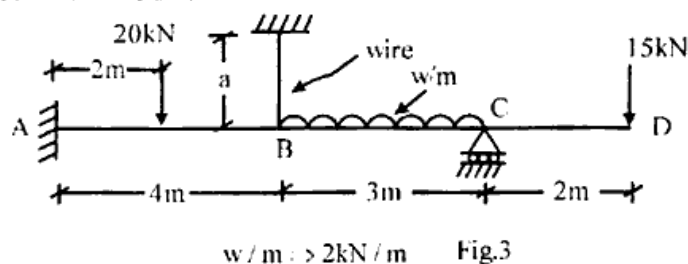
- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
  2. Assume suitable data wherever necessary.
  3. Illustrate your answer necessary with the help of neat sketches.
  4. Use of pen Blue/Black ink/refill only for writing the answer book.

**SECTION - A**

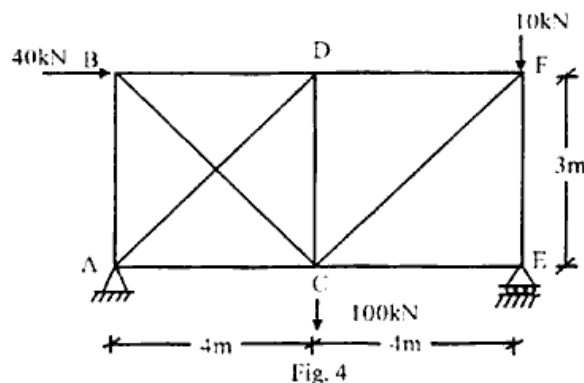
1. a) Obtain the flexibility coefficients for the structures shown below. 4



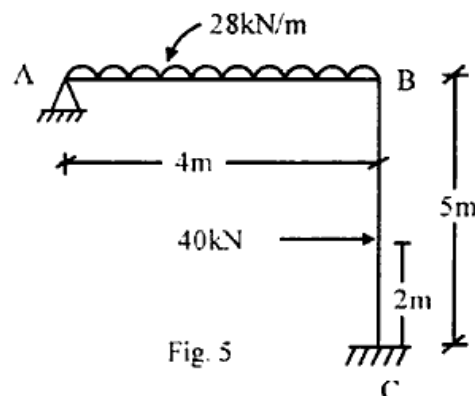
- b) Analyse the continuous beam shown in Fig. 3 by making use of flexibility method. Assume  $EI$  constant. Also draw the BMD. 10



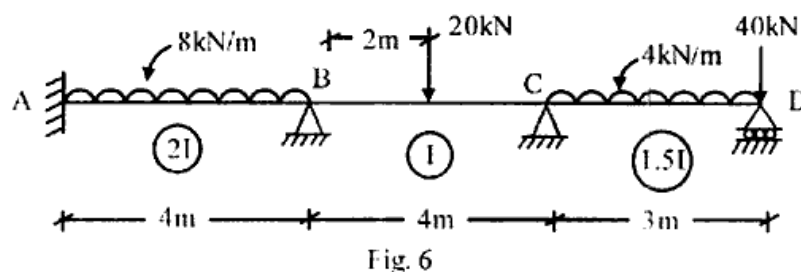
2. Analyse the Indeterminate truss shown in Fig. 4 by using flexibility method. Assume  $EA$  constant. 13



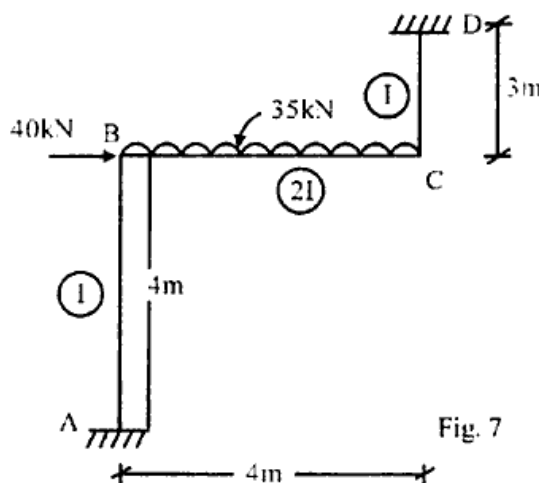
3. Analyse the portal frame shown in Fig. 5. by using flexibility method. Also draw the BMD. Assume EI constant. 13



4. a) Enlist the similarities AND Differences in Flexibility and stiffness Method. 4  
b) Analyse the continuous beam shown in Fig. 6 by using stiffness method global approach. Draw BMD. 9



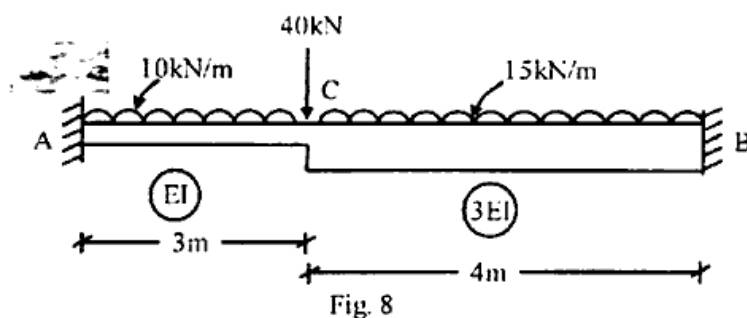
5. Analyse the frame shown in Fig. 7 by using stiffness method Global approach. Draw BMD. 13



#### SECTION - B

6. a) Derive element stiffness equation for a continuous beam/plane frame member having element Displacement matrix  $\frac{\{De\}}{4 \times 1}$ . 10  
b) Explain with suitable example.  
i) Transformation Matrix 4  
ii) Rotation Matrix

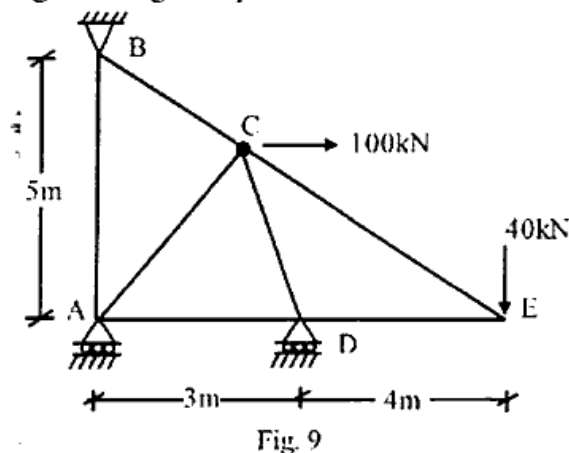
7. Analyse the fixed beam shown in Fig. 8 by using stiffness method member approach. Draw BMD. 13



8. Derive element stiffness matrix for a plane frame member considering sway and axial deformation. 13

9. a) Explain frontal storage technique in detail with suitable example. 3  
 b) Draw and explain a flow chart for a grid member by using stiffness method member approach. Also, enlist the various subroutines required for developing a code in programming language. 10

10. a) Explain In-core methods and out - of core methods used for storage and memory requirements. 5  
 b) Prepare the data file for generating an input data file for the truss shown in Fig. 9. 8



\*\*\*\*\*