B.E. Civil Engineering Sixth Semester

CE602 - Structural Analysis-II

P. Pages : 4 **GUG/W/18/1668**

Time : Three Hours * 1 3 1 2 * Max. Marks : 80

Notes : 1. All questions carry equal marks and compulsory.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Use of calculator is allowed.

1. Analyse the frame as shown in fig. 1 by moment distribution method and draw BMD. **16**

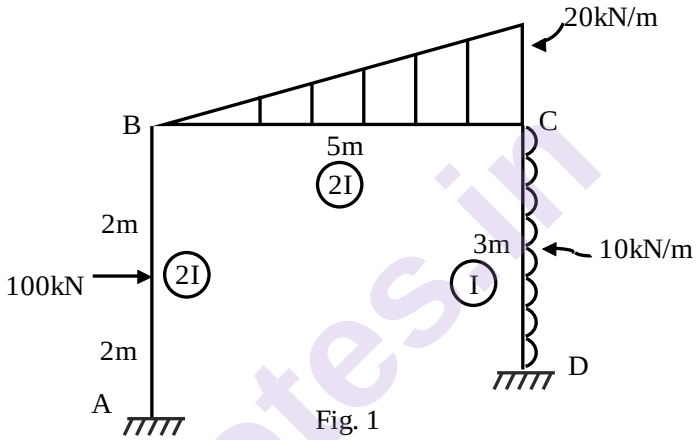

Fig. 1

OR

2. Using substitute frame method find **16**

1) Maximum '+ve' BM in span AB
2) Maximum '-ve' BM at C
3) Minimum '+ve' and Minimum '-ve' BM in space BC.

Assume MI for all columns are (I) and beams (2I); Take live load 20kN/m and dead load as 35kN/m. Take from as shown in fig. 2.

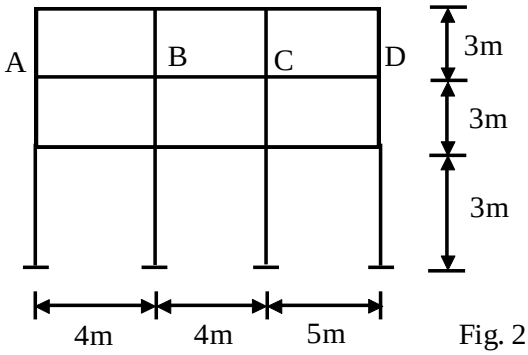

Fig. 2

3. Analyse the frame as shown in fig. 3 by Kan's method and draw BMD. **16**

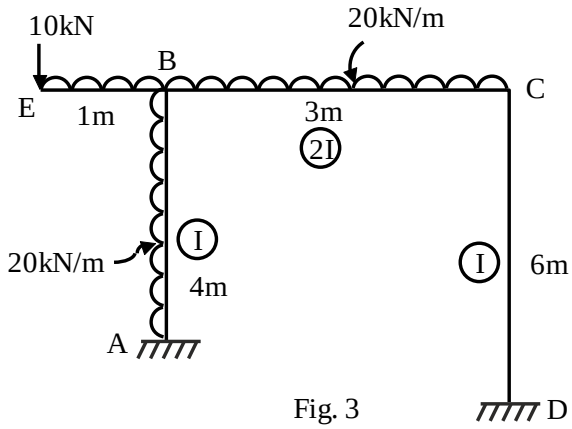

Fig. 3

OR

4. Analyse the frame shown in fig. 4 by Kani's method and draw BMD. **16**

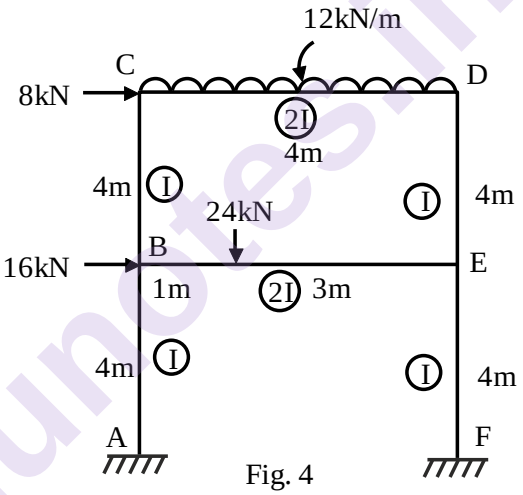

Fig. 4

5. Analyse the beam shown in fig. 5 by column analogy method and Draw BMD. **16**

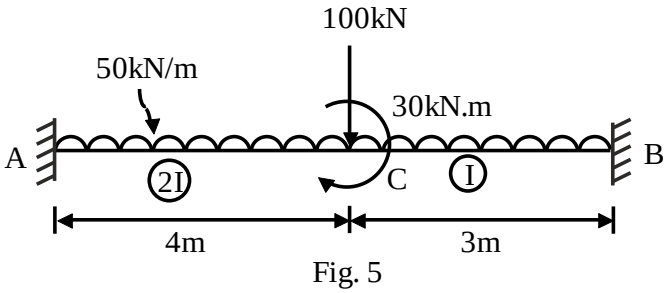

Fig. 5

OR

6. a) Analyse the fixed beam as shown in fig. 6 by column analogy method. **8**

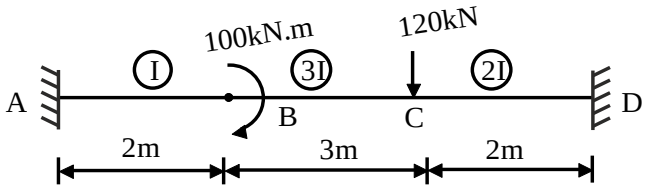

Fig. 6

b) Calculate stiffness and carry over factor from 'A' to 'B' for the beam as shown in fig. 7 by column analogy method. **8**

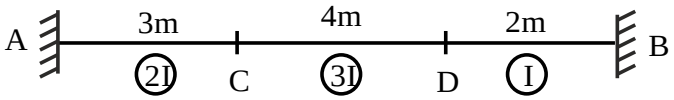

Fig. 7

7. Analyse the continuous beam as shown in fig. 8 by flexibility method and draw BMD. **16**

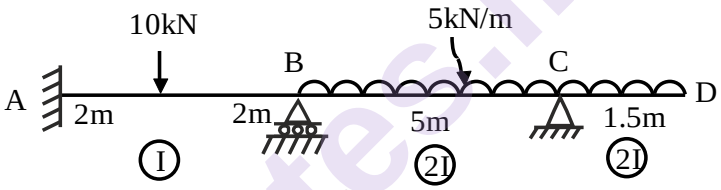

Fig. 8

OR

8. Analyse the three legged frame as shown in fig. 9 by moment distribution methods. **16**

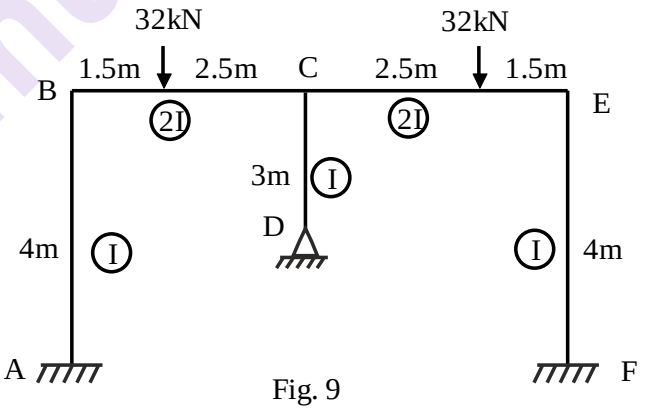

Fig. 9

9. Analyse the truss by strain energy method and find the forces in members of truss shown in fig. 10. **16**

1) The wooden beam 230mm x 300mm in cross section with modulus of Elasticity 10 GPa.

2) Cast iron strut of 3000mm^2, area and modulus of Elasticity = 100 GPa.

3) Mild steel tie rods of 30mm diameter with modulus of Elasticity = 200 GPa

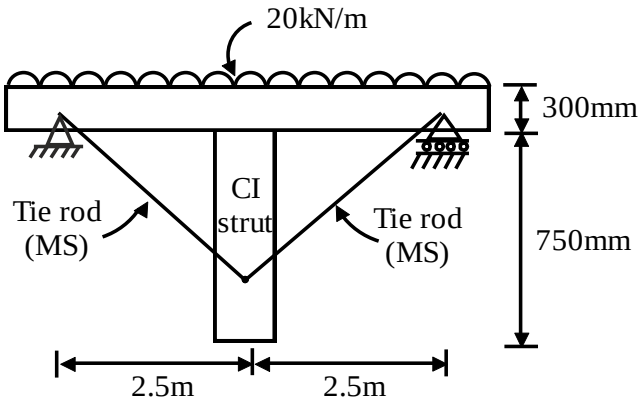

Fig. 10

OR

10. a) A rectangular type strain rosette is mounted on steel specimen with following observation. **10**

Strain at 0^o = + 300 microstrains
Strain at 45^o = - 180 microstrains
Strain at 90^o = + 200 microstrains

If modulus of Elasticity is 200 GPa and Poisson's ratio is 0.3 Calculate the principle stresses and their directions.

b) Explain: **6**

i) Plane stress and plane strain problems.
ii) Generalized Hooke's law.
iii) Types of strain gauges and its application

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