* 3 9 8 4 *

Theory of Structures - II
(1070)

P. Pages : 4

Time : Three Hours **Max. Marks : 100**

Instructions to Candidates :
1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Solve **any one** question from each unit.
5. Black figure to right indicate full marks.
6. Neat diagram must be drawn wherever necessary.
7. Assume suitable data if necessary.

UNIT - I

1. Analyse the frame as shown in fig. 1 by strain energy method. Sketch the bending moment diagram. **20**

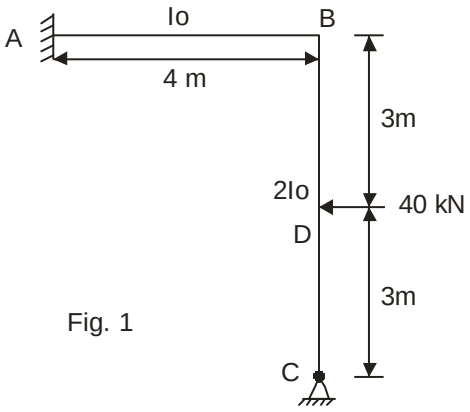


Fig. 1

2. a) Define : **10**
i) Compatibility ii) Flexibility iii) Stiffness
iv) Linear & non linear structures v) Indeterminacy

b) Analyse the beam as shown in fig. 2 gives below by slope defective method. Draw B.M.D. & sketch deflected shape of the beam. **10**

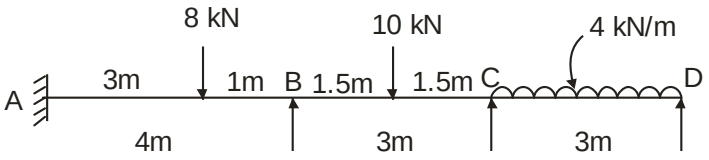


Fig. 2

UNIT – II

3. Analyse the frame given below as shown in fig. 3 by moment distribution method. **20**

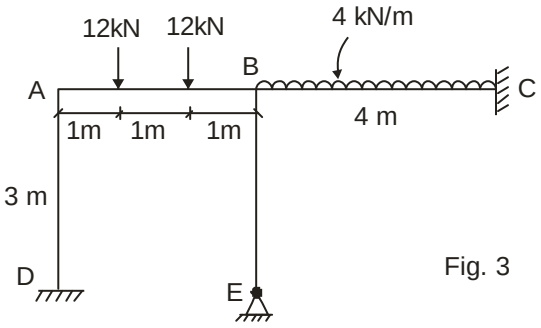


Fig. 3

4. a) Define : **6**

i) Distribution factor ii) Relative stiffness

iii) Absolute stiffness

b) Analyse the frame as shown below in fig. 4 by portal method. **14**

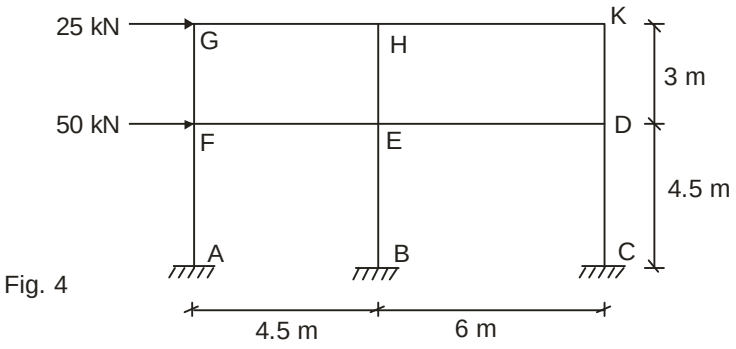


Fig. 4

UNIT - III

5. Analyse the beam shown in Fig. 5 given below by flexibility method (EI=constant)

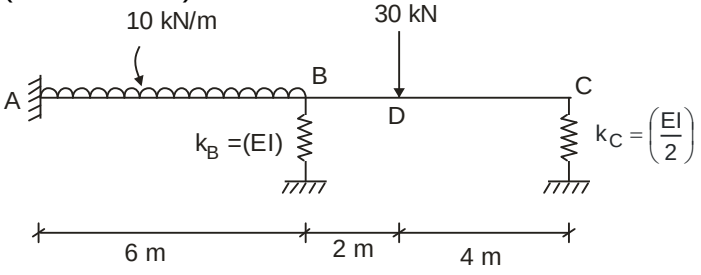


Fig. 5

6. Analyse the frame shown in fig. 6 given below by flexibility method (EI = constant) **20**

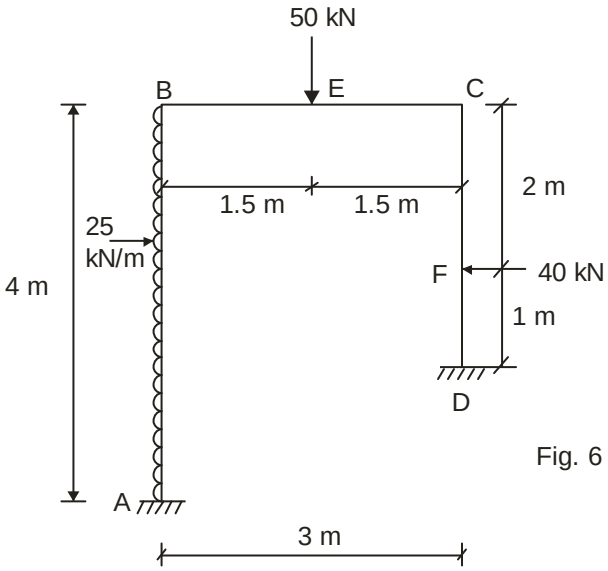


Fig. 6

UNIT - IV

7. Analyse the beam as shown below in fig. 7 by stiffness method support B is sink by 25 mm. **20**

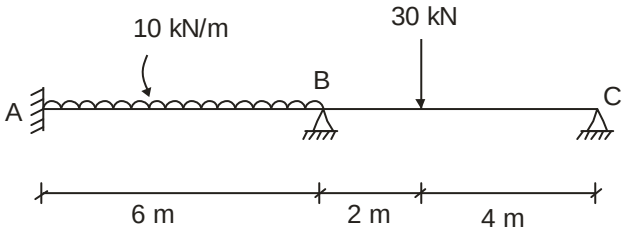


Fig. 7 (EI = 3800 kN m^2)

8. Analyse the frame given below as shown in Fig. 8 by stiffness method. **20**

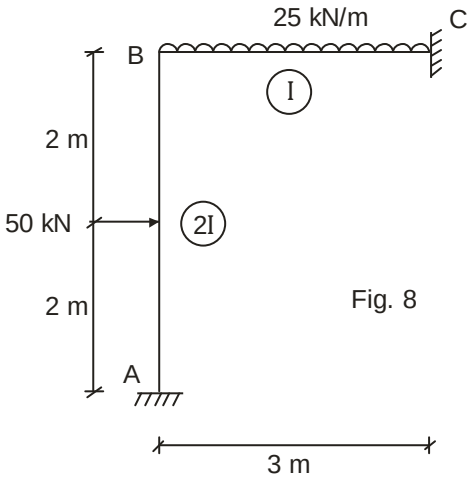


Fig. 8

UNIT - V

9. a) Determine the shape factor for the beam section as shown in fig. 9. Find also the fully plastic moment of the beam section. Take fy = 250 N/mm^2. **6**

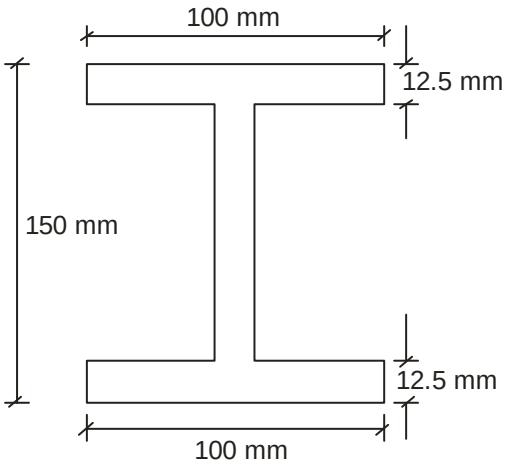
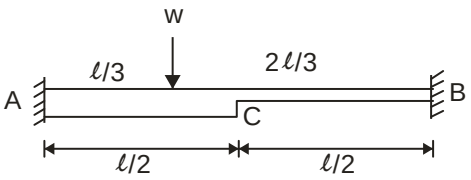


Fig. 9

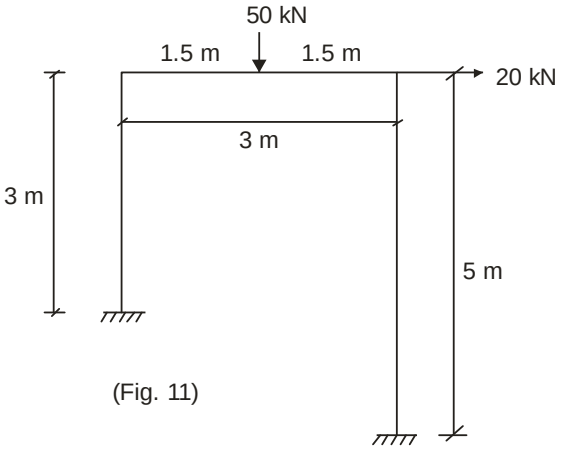
b) Find the value of collapse load w of a beam as shown in fig. 10 given below. **8**



(Fig. 10)

c) State & explain upper and lower bound theorem. **6**

10. A portal frame ABCD is as shown fig. 11 given below. All the members have the same plostic moment Mp. Find the plostic moment required. Find also the plostic moment required of the horizontal force at point 'c' is reversed. **20**



(Fig. 11)

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