Seat No. | | | | | | |

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मजल - 032

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. Answersheet 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. Neat diagrams should be drawn wherever necessary.
6. Use of non programmable calculator is allowed.
7. Assume suitable data if necessary.

UNIT - I

1. a) Explain compability conditions. **5**

b) A portal frame ABCD is hinged at A and roller support at D. The frame carries loading as shown in fig. 1 using Costigliano's first theorem. Find horizontal deflection at roller support D. Take $EI = 35 \times 10^3\ kN/m^2$. **15**

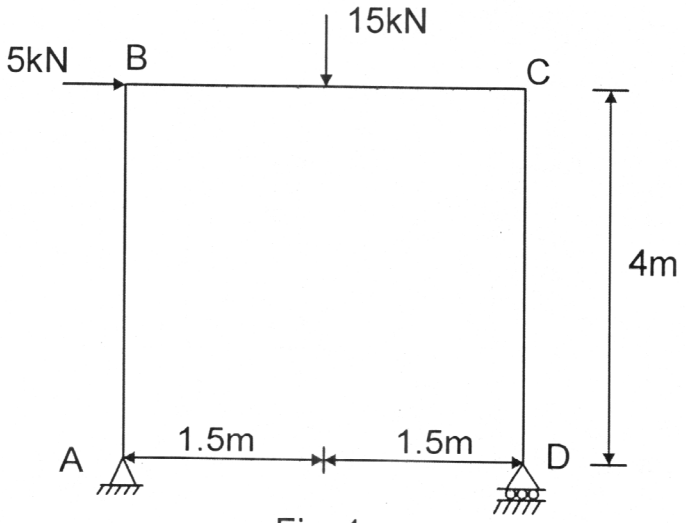

Fig. 1

मजल - 032

2. Analyse the frame shown in fig. 2 by slope deflection method. Draw bending moment diagram. **20**

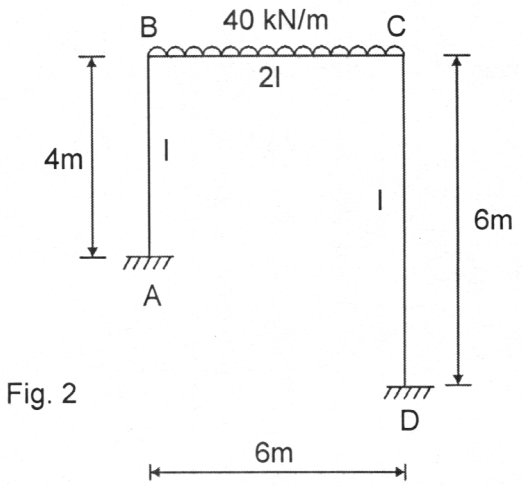

Fig. 2

UNIT - II

3. Analyse the frame shown in fig. 3 by moment distribution method and sketch bending moment diagram. **20**

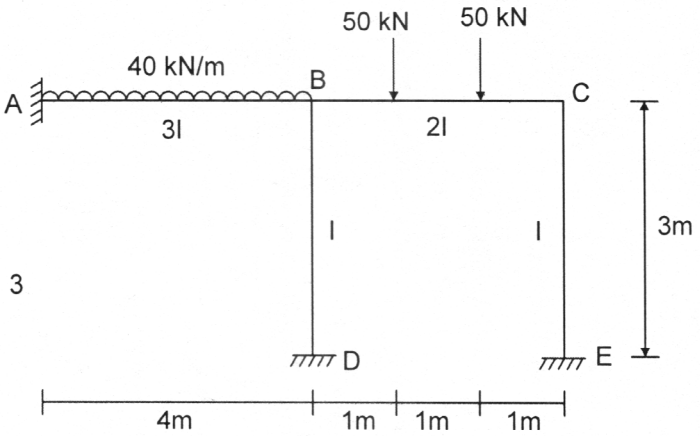

Fig. 3

4. Analyse the frame shown in fig. 4 by cantilever method. Take cross sectional areas of all columns as the same. **20**

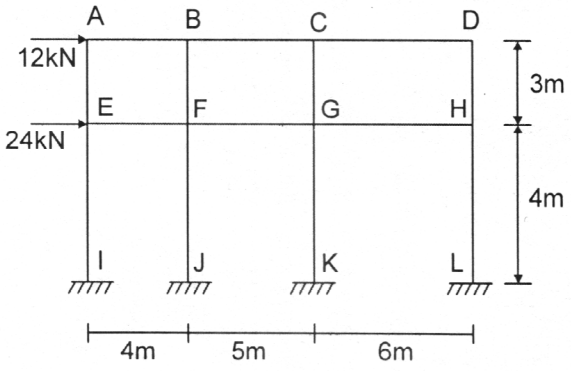

Fig.4

UNIT - III

5. Analyse the portal frame ABCD shown in fig. 5 by flexibility method EI constant throughout. **20**

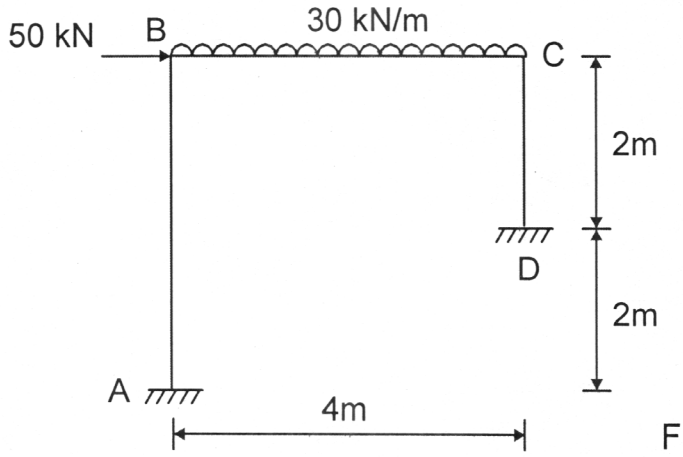

Fig. 5

6. Analyse the continuous beam as shown in fig. 6 support B has a downward settlement of 30mm. Calculate the support reaction at D by flexibility matrix method. Take $EI = 5600 kNm^2$. **20**

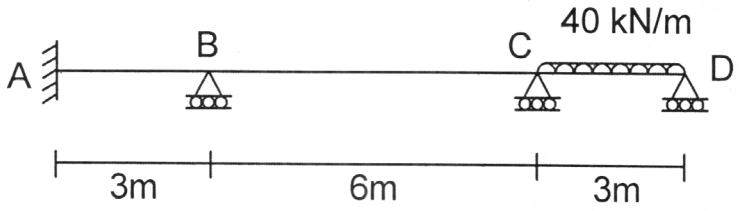

Fig. 6

UNIT - IV

7. Analyse the beam shown in fig. 7 by stiffness matrix method. **20**

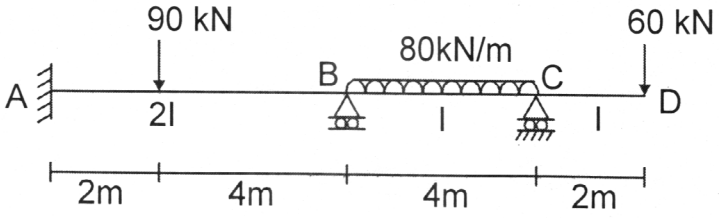

Fig. 7

8. Using stiffness matrix method analyse the frame shown in fig. 8. Take EI constant throughout. **20**

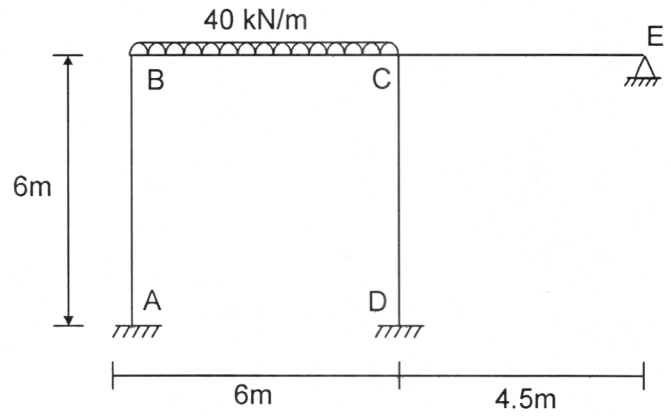

Fig. 8

UNIT - V

9. a) Define :
i) Collapse mechanism. ii) Plastic Hinge. iii) Plastic moment. **6**

b) Determine the collapse load in the continuous beam as shown in fig. 9. **14**

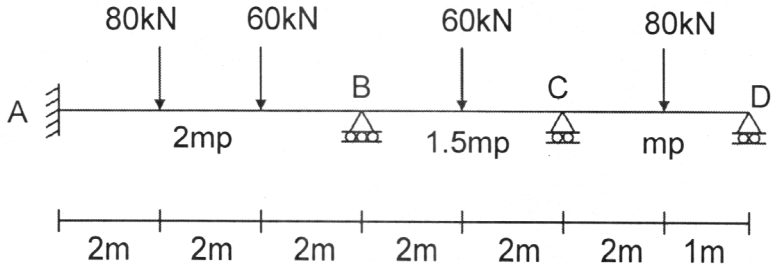

Fig. 9

10. Determine the collapse load W_c in the frame as shown in fig. 10. **20**

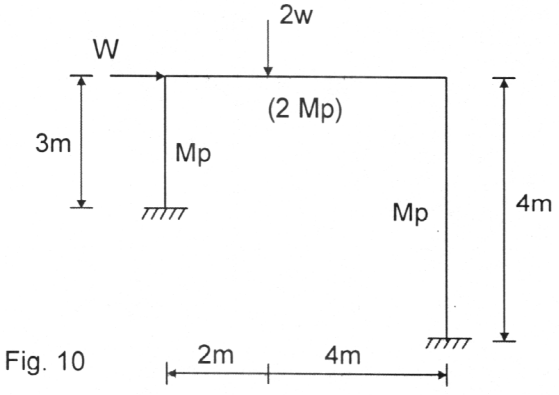

Fig. 10

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