

B.E. / B.Tech. Civil Engineering (Model Curriculum) Semester-V
PCC-CE504 - Structural Analysis-I

P. Pages : 3

Time : Three Hours



GUG/W/24/13727

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
 2. Assume suitable data wherever necessary.

1. Analyse the continuous beam shown in figure by three moment theorems. Draw bending moment diagram. (EI constant) **16**

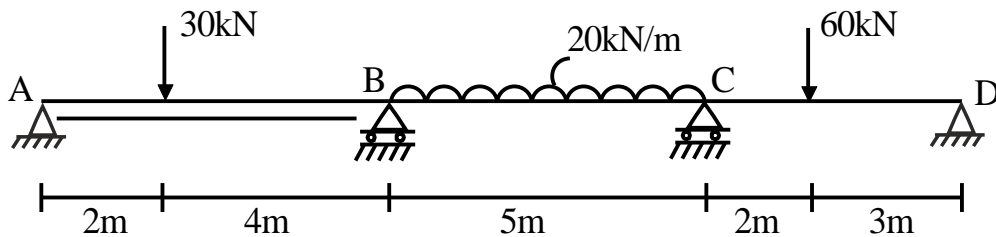
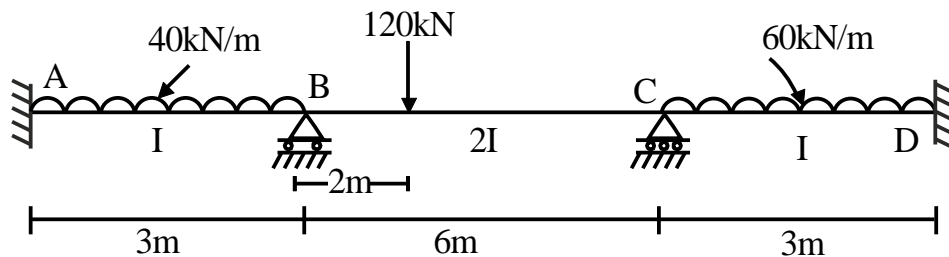


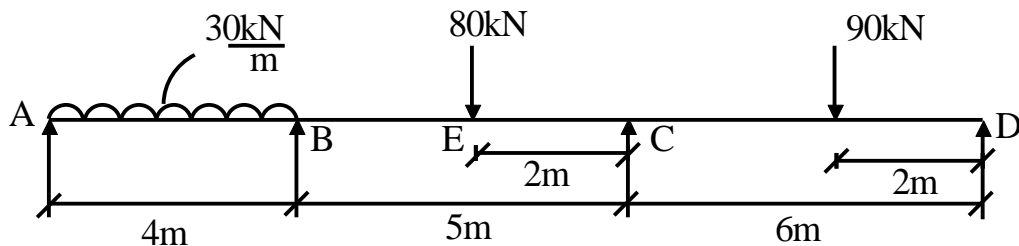
Figure 1

OR

2. Analyse the continuous beam shown in figure by slope deflection method. Draw bending moment diagram. **16**

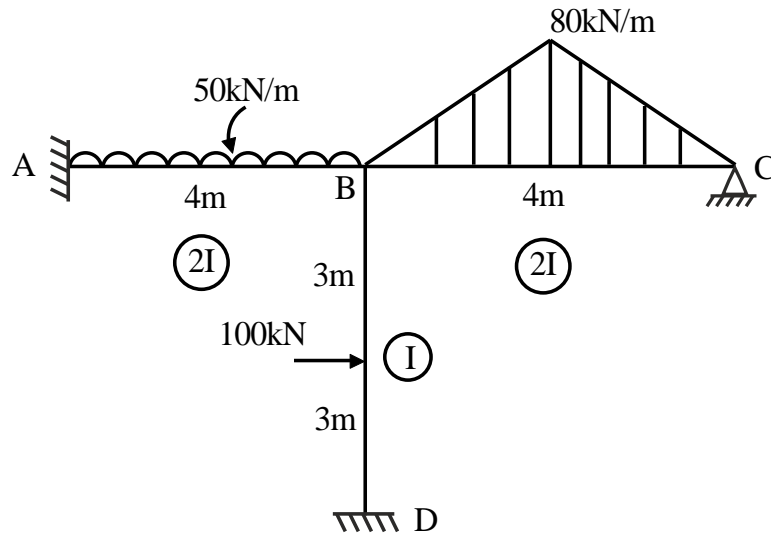


3. Draw BMD and SFD for a beam shown in figure. Use MDM for analysis. **16**

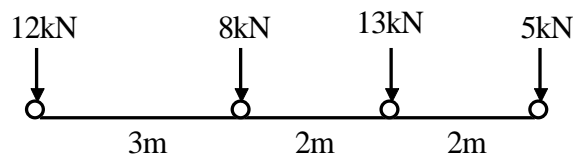


OR

4. The rigid frame as shown in figure is subjected to loads. Analyse the frame using MDM and draw BMD. 16

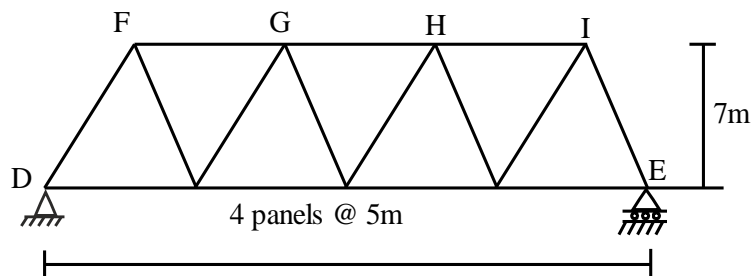


5. Calculate the maximum BM at 8 m from left. Support of 12 m span simply supported beam. When the given load is moving from right to left. 16



OR

6. A vehicle moves left to right through upper chord of the truss bridge. If the vehicle weights 75 kN. Find the axial force using ILD. In members with double cross. 16



7. Analyse the portal frame shown in figure 7 by strain energy method. Draw BMD. 16

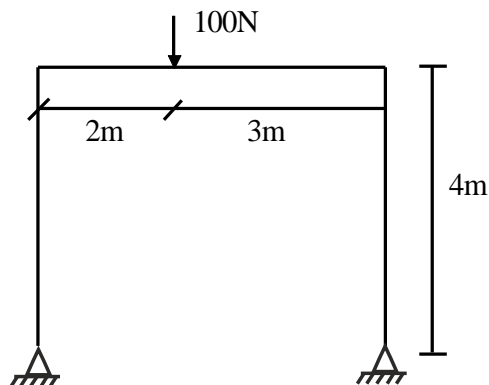
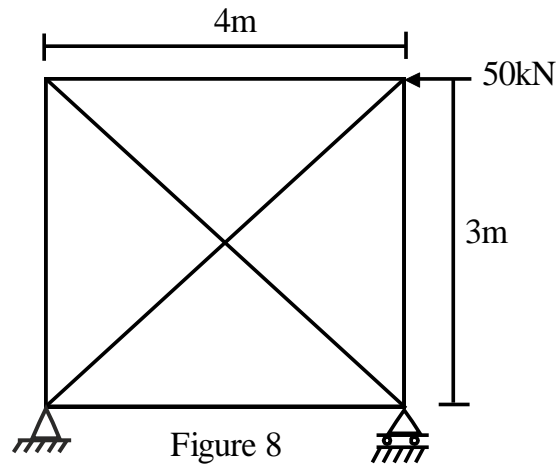


Figure 7

OR

8. Analyse the redundant truss shown in figure 8 by strain energy method.

16



9. a) Derive the expression of buckling load of column if the both ends are fixed. 8
- b) A copper ($E = 1.1 \times 10^5$ MPa) column built into the ground has length $L = 5$ m, fixed at both ends and is under compressive load P . The dimensions of the cross section are $b = 180$ mm and $d = 260$ mm. Determine the critical load to buckle the column. 8

OR

10. A parabolic arch, hinged at ends has a span 30 m and rise 5 m. A concentrated load 12 kN acts 10 m from the left hinge. Calculate the horizontal thrust and reactions at the hinges. Also, calculate the maximum bending moment anywhere on the arch. 16
