

**B.E. Fourth Semester (Civil Engineering) (CGS)
10183 : : Theory of Structures - I : 4 CE 03**

P. Pages : 2

Time : Three Hours



AU - 2565

Max. Marks : 80

- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.

SECTION - A

1. A fixed beam of 12m is subjected to UDL over left half of span of intensity 20kN/m and a point load 50kN at a distance of 2m from right support. Take EI constant. Draw SFD and BMD use fundamentals. **14**

OR

2. A continuous beam ABCD is fixed at 'A' and simply supported at B and C. The beam CD is overhanging. The span AB = 6m, BC = 5m and overhanging CD = 2.5m. The moment of Inertia of span BC is 2I and AB and CD is I. The beam is carries UDL of 20 kN/m over span AB, a point load of 50kN in BC at a distance of 3m from 'B' and a point load of 80kN at the free end. Draw BMD and SFD use three moment theorem. **14**

3. Find out vertical and rotational displacement at point 'B' for a beam as shown in fig 1. **13**
Take $E = 2 \times 10^5 \text{ N/mm}^2$ $I = 5 \times 10^8 \text{ mm}^4$. Use unit load method.

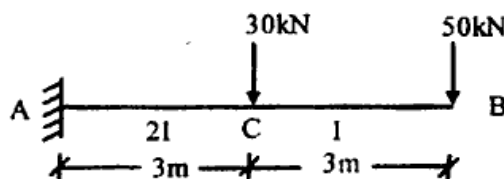


Fig. 1

OR

4. Find the vertical deflection at point 'E' for a truss loaded as shown in fig 2. The cross sectional areas of members are in cm^2 . $E = 2 \times 10^5 \text{ N/mm}^2$. **13**

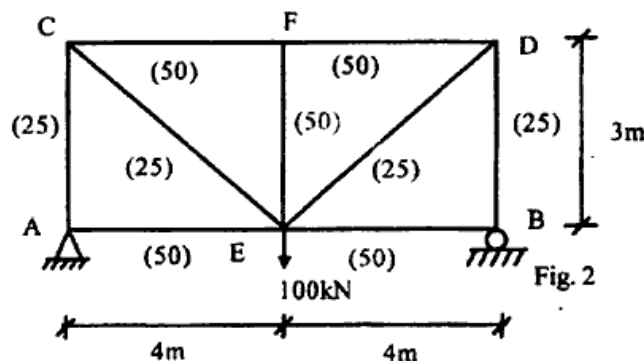


Fig. 2

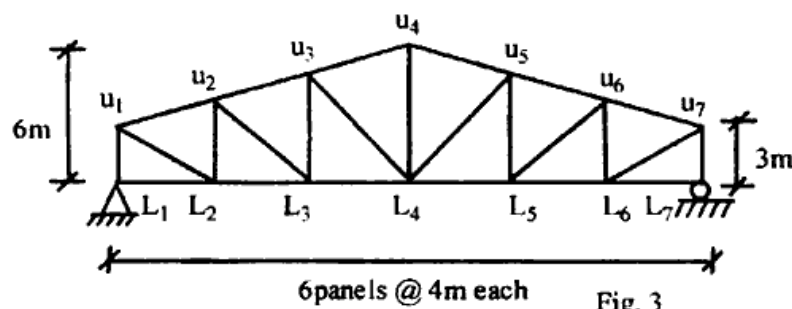
5. A simply supported beam AB has 5m span Draw ILD for R_A , R_B , SF_x and Bm_x at a section 'x' 2m from Left support. Determine ordinates at 1m interval. Show the calculations. **13**

OR

6. Two point loads 10kN and 5kN spaced 3m apart crosses a girder of 10m span. The smaller load leading from left to right. Calculate maximum values of R_A , R_B , SF and BM at a section 4m from left support. **13**

SECTION - B

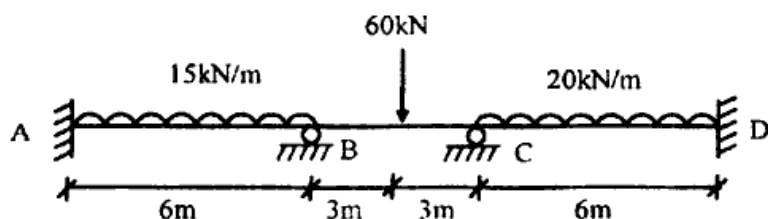
7. Plot ILD for the forces in the members U_2U_3 , U_2L_3 , L_2L_3 of the truss as shown in fig 3. 13



OR

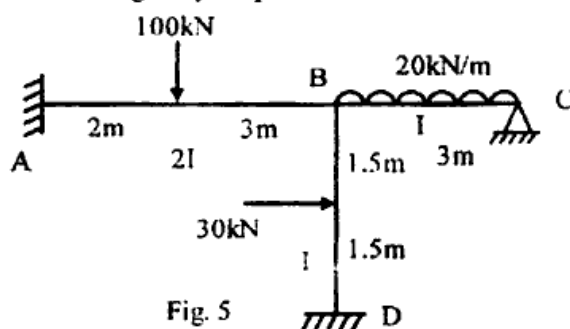
8. A three hinged arch of 20m span and 4m rise carries a point load of 150kN at 4m horizontally from the Left hinge. Calculate normal thrust and Radial shear at a section under the load. Also calculate maximum and minimum BM. Draw BMD. Third hinge is at the crown. 13

9. Analyze the beam loaded as shown in fig 4 by slope deflection method Draw BMD and SFD. 14



OR

10. Analyze the frame as shown in fig 5 by slope deflection method. Draw BMD. 14



11. Analyze the beam as shown in fig 4 by moment distribution method. Draw BMD and SFD. 13

OR

12. Analyze the frame on shown in fig 5 by moment distribution method. Draw BMD. 13
