BT-4/M-20   **34109**

STRUCTURAL ANALYSIS-II
CE-202-N

Time : Three Hours]   [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit out of eight questions. All questions carry equal marks.

Unit I

1. (a) Determine the difference between statically determinate and statically inderminate structures. **5**

   (b) State the second theorem of CASTIGLIANO. **10**

2. Determine the forces in the members of the frame as shown in Fig. (i). Sectional areas of the members are as follows :

   Horizontal members : 1000 mm^2

   Vertical members : 1500 mm^2
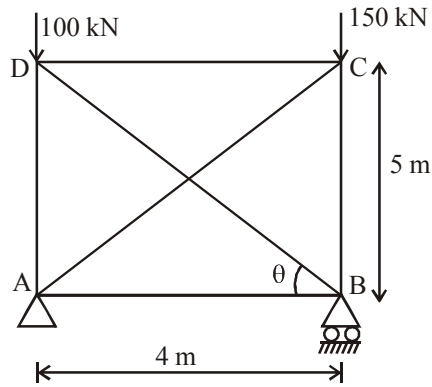
   Diagonal members : 2000 mm^2

Fig. (i)

Unit II

3. Analyse the continuous beam as shown in Fig. (ii) by 'Slope Deflection Method'. **15**
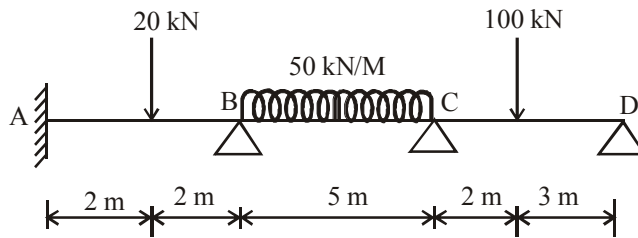

Fig. (ii)

4. Analyse the partal frame as shown in Fig. (iii) by 'Moment Distribution Method'. **15**
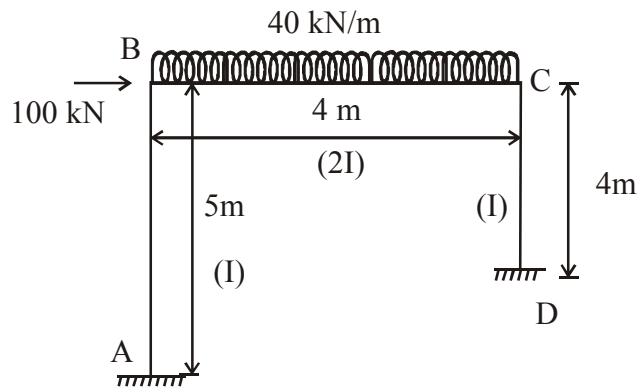
Fig. (iii)

Unit III

5. A fixed beam AB of span 9 m carries point loads 150 kN and 100 kN at distances 3 m and 6 m from the left end A. Determine the fixing moments at the ends. **15**

6. A two-hinged parabolic arc of span 'L' and rise '*h*' carries uniformly distributed load of '*w*' metre run over the whole span. Assuming $I = I_0 \sec \alpha$, find the expression for the horizontal thrust developed.

Unit IV

7. What do you understand by unsymmeterical bending ? Illustrate with example. Also define centroidal axis and shear centre. **15**

8. The three-hinged stiffening girder of a suspension bridge of span 100 metres is subjected to two concentrated loads of 400 kN and 200 kN at distances 20 metres and 60 metres from the left end. Calculate the shear force and bending moment for the girder at a distance 30 metres from the left end. The supporting cable has a central dip of 10 m. Find also the maximum tension in the cable.

15