Roll No. ..... **Total Pages : 03**

BT-4/M-20 34018

STRUCTURAL ANALYSIS-II

CE-202E

Time : Three Hours] [Maximum Marks : 100

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

Unit I

1. (a) State and prove the 1st and 2nd Castiglianos theorem. **15**

(b) Explain the two methods of analysis of structures with examples. **5**

2. Analyse the redundant frame as shown in fig(i). sectional areas of the members are as follows :

Horizontal members : 2000 mm^2

Vertical members : 3000 mm^2

Diagonal members : 4000 mm^2

Evaluate the forces in all the members : **20**

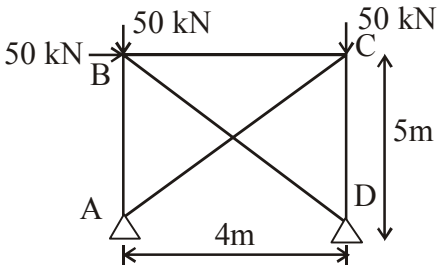

Fig. (i)

Unit II

3. Analyse the continuous beam as shown in fig(ii) by 'slope Deflection method' and draw B.M.D. : **20**

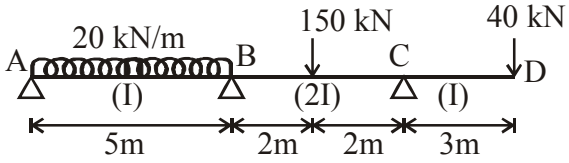

Fig. (ii)

4. Analyse the portal frame as shown in fig(iii) by using 'Moment Distribution method' and drawn the B.M.D. : **20**

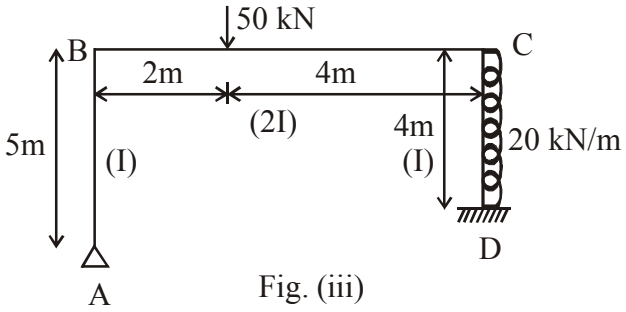

Fig. (iii)

Unit III

5. A fixed beam of span L carries a point load W at mid span. The moment of inertia of the section is I for the left half of the span and 2I for the right half of the span. Find the fixed end moments. **20**

6. A two-hinged parabolic arch of span 100 m and central rise 10 m carries a uniformly distributed load of 50 kN/m over the right half of the span and a concentrated load of 100 kN at the crown.

Determine the horizontal thrust at each support and also Bending moment, Normal Thrust and shear force at left quater span of the arch. **20**

Unit IV

7. (a) Define the unsymmetric Bending and centroidal axis. **10**

(b) Define shear central. Locate the shear centre for an ISA 100×75×8 mm angle section. **10**

8. A suspension bridge of 100 mm span has two hinged stiffening girders supporting by two cables, having a central dip of 10 m. The dead load on the bridge is 6 kN/m^2 and live load is 15 kN/m^2, which covers the left half of the span. Calculate the shear force and bending moment for the girder at 25 m from the left end. Find also the maximum tension in the cable for this position of the load. The roadway is 5 m. **20**