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Printed Pages : 3

BT-4 / M–17

STRUCTURAL ANALYSIS–II

Paper–CE–202 E, Opt. (I)

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *(i) Attempt total five questions, selecting at least one question from each unit.*

(ii) All questions carry equal marks.

(iii) Assume any data suitably if missing and state clearly.

Unit–I

1. (a) What do you understand by the static indeterminancy of the structures ? Illustrate with suitable examples. 8

(b) State the prove the 2nd Castigliano's theorem Explain how it can be useful for analysis of structure (08+04)

2. Analyse the redundant frame as show in Fig. 1 All the members have same cross-sectional area

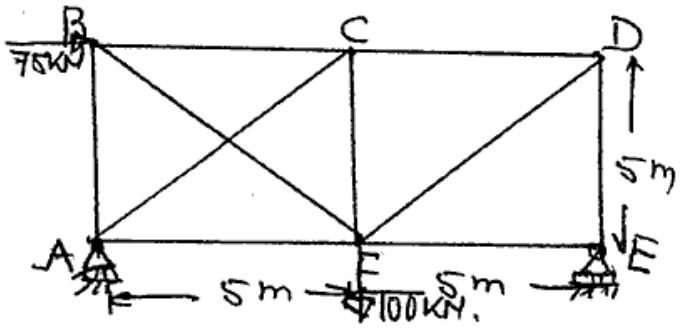

Fig. 1 20

Unit–II

3. Analyse the 'Continuous beam' as shown in Fig. 2 by 'Slope Deflection Method

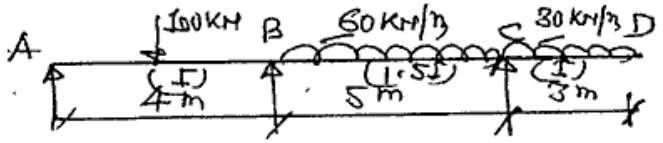

Fig. 2

4. Analyse the 'Portal Frame' as shown in Fig. 3 by Moment Distribution Method.

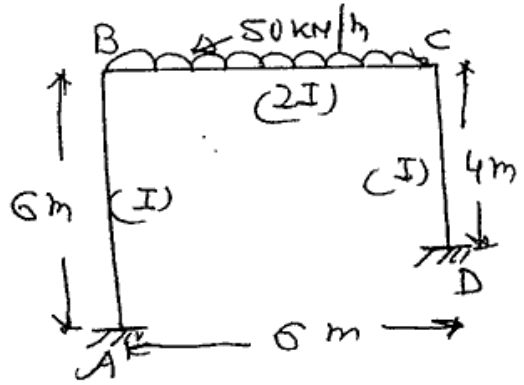

Fig. 3 20

Unit–III

5. Calculate the fixed end Moment for the beam, loaded as shown in fig. 4, by Column Analogy Method

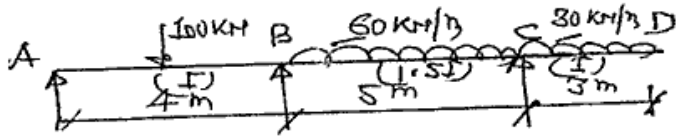

Fig. 4 20

6. A two hinged parabolic Arch of span 25 m with central rise of 5.0 m carries u.d.l. of intensity 50 kN/m covering the whole span. A point load of 500 kN is also acting at the mid span of the Arch. Calculate the reactions at the supports. Also calculate the magnitude of B.M., S.F and N.T at a distance of 6.25 m from left hand side. 20

Unit–IV

7. (a) What do you understand by unsymmetrical bending ? Explain with significance with suitable example. 10

   (b) Define shear centre. Calculate the shear centre for the channel section ISMC 250. 10

8. A suspension bridge of span 100 m. has two three hinged stiffening girders supported by two cables having central dip of 7.5 m. The roadway has a width of 7.5 m. The D.L. on the bridge is 5.0 kN/m^2 and line load of 18 kN/m^2 which covers the right half of the span. Determine the B.M. and S.F. in the girder 25 m from the left side. Also find the maximum tension in the cable for this position of load. 20