No. of Printed Pages : 4

BICE-011

B.Tech. IN CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00875

December, 2014

BICE-011 : STRUCTURAL ANALYSIS – II

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any **seven** questions. All questions carry equal marks. Assume missing data if any. Use of calculator is permitted.*

1. A pin jointed frame shown in Figure 1 is carrying a load of 6t at C. *10*

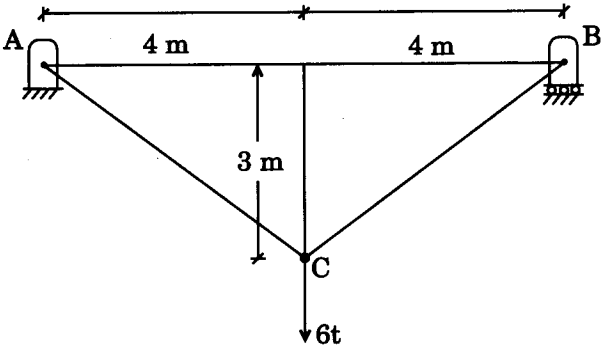

Figure 1

Find the vertical as well as horizontal deflection of "C". Take area of member AB = 10 cm^2, BC = 15 cm^2 and AC =15 cm^2. E = $2{\cdot}0 \times 10^3$ t/cm^2.

2. A cantilever 2 m long is carrying a load of 2000 kg at free end and 3000 kg at a distance 1 m from the free end shown in Figure 2. Find the slope and deflection at the free end. Take $E = 2{\cdot}0 \times 10^6$ kg/cm^2 and I = 15,000 cm^4. *10*

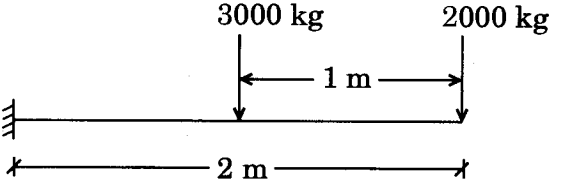

Figure 2

3. A three hinged circular arch of span 12 m has a rise of 4 m. The arch is loaded with a point load of 8t at a horizontal distance 6 m from the left support as shown in Figure 3. Determine the horizontal thrust, reaction and bending moment under the load. *10*

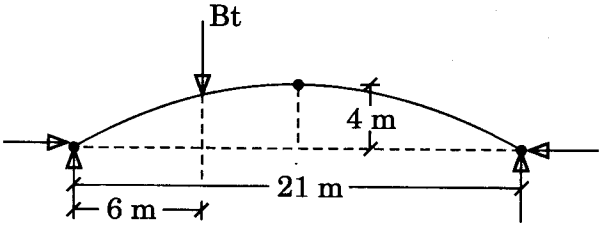

Figure 3

4. A two hinged parabolic arch of span 'l' and rise 'h' carries uniformly distributed load w/unit length over the entire span. Show that the horizontal thrust in the arch = $\frac{wl^2}{8h}$. *10*

5. A rectangular portal frame of uniform flexural rigidity EI carries a uniformly distributed load as shown in Figure 4. Draw the B.M.D by moment distribution method. *10*

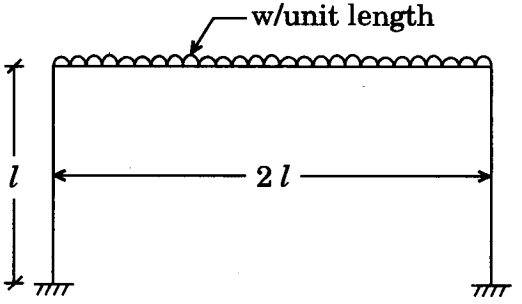

Figure 4

6. For the span shown in Figure 5, obtain the maximum bending moment at section C, 20 m from A due to loads in the position indicated. *10*

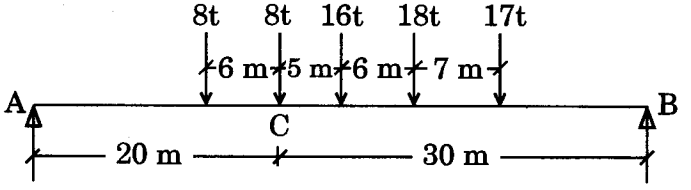

Figure 5

7. A simply supported beam of length 2 m is subjected to uniformly distributed load of 2 t/m over the entire length. Determine the value of maximum positive and negative bending moments. Also calculate the maximum deflection of the beam. Take flexural rigidity of the beam as $1{\cdot}0 \times 10^{10}$ kg-cm^2. *10*

8. Analyse the frame shown in Figure 6 by strain energy method. Ends A and C are hinged. *10*

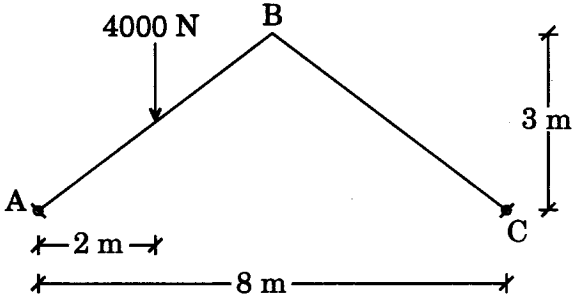

Figure 6

9. Write short notes on any ***two*** of the following : *10*

   (a) Force method of analysis

   (b) Moment distribution method

   (c) Castigliano's theorems