Roll No. | | | | | | | | | | | | | Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(CE) (2011 Onwards) (Sem.–5)

STRUCTURAL ANALYSIS – II

Subject Code : BTCE-503

Paper ID : [A2080]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

a) What is static indeterminacy of a parabolic arch fixed at both ends?

b) What is a determinate structure? How do we check the determinacy of a structure?

c) Write the names of approximate methods of structural analysis and explain any one.

d) What does influence line diagram represent, explain.

e) What is strain energy? Under what conditions the strain energy method is suitable to use?

f) What is carry over factor? Discuss in brief.

g) Discuss the concept of three moments.

h) What is difference between slope deflection and moment distribution method?

i) Discuss in brief the unit load method of analysis.

j) What is difference between method of joints and method of section?

SECTION-B

2. Analyse the continuous beam ABCD shown in Figure 1 if support C settles down by 5 mm. Take E = 15 kN/m^2. Moment of inertia is constant throughout and is equal to 5 × 10^9 mm^4.

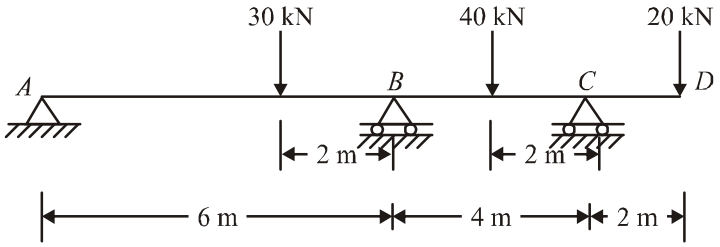

Figure.1

3. Find the force in the member BD of the frame as shown in Figure 2, if the member BD is subjected to a rise in temperature of 16.67° C. Area = 1000 mm^2 and E = 2 ×10^5 N/mm^2 for all the members, $\alpha = 12 \times 10^{-6}$/°C.

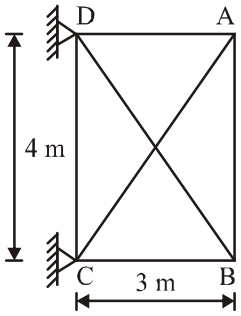

Figure.2

4. Determine the influence line for R_a for the continuous beam as shown in Figure 3. Compute I.L ordinates at 1 m intervals.

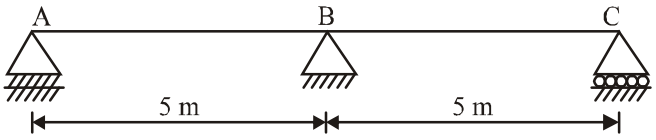

Figure.3

5. A cantilever of uniform flexural stiffness is propped at the remote end. Find the reaction on the prop when a load W is applied at the centre of the cantilever.

6. Analyse the portal frame as shown in Figure 4 by Kani's method. Draw the bending moment diagram and sketch the deflected shape of the frame. Take EI constant for all the members.

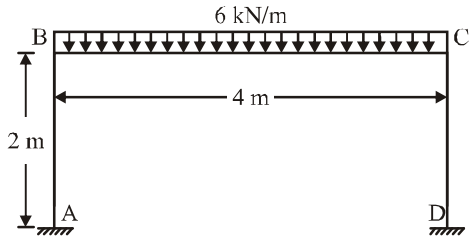

Figure.4

SECTION-C

7. Draw the B.M. diagram and sketch the deflected shape of the frame as shown in Figure 5. All members are of the same material.

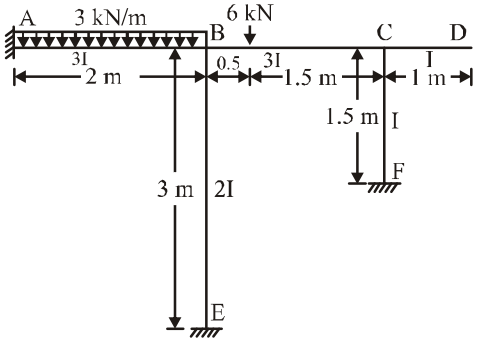

Figure.5

8. For the continuous beam shown in Figure 6, determine the support moments at B and C.

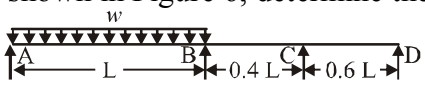

Figure.6

9. A multistoried building as shown in Figure 7, consists of 4 storyed 3 bay frames spaced at 3 m c/c. Live load on slab is 3 kN/m^2 and dead load is 3.5 kN/m^2. The spans of the beams from left to right are 6 m, 4 m and 4 m respectively. Storey height is 3.5 m. Moment of inertia of beams is 1.5 times that of columns. Self-weight of beams is 3.5 kN/m. Determine the maximum moment in the beam at the junction of first span and second span of an intermediate floor.

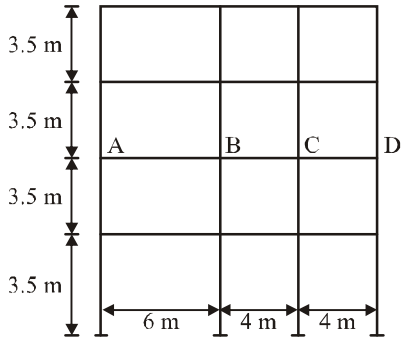

Figure.7