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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 :

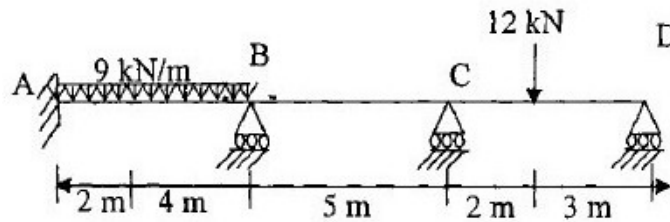
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**1) Write briefly :**

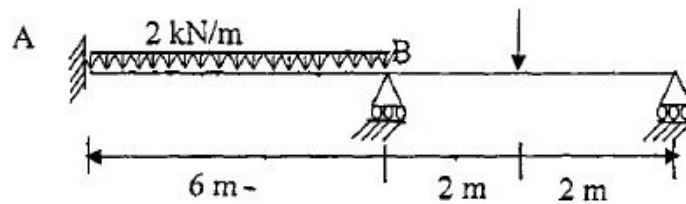
- a) What is the difference between static and kinematic indeterminacies of a structures?
- b) Differentiate between system coordinates and element coordinates in the element approach of structural analysis.
- c) State castigliano's theorem.
- d) Define generalize Slope Deflection equation for a member AB, having Modulos of Elasticity E, Moment of Inertia I and span L.
- e) Differentiate force method and displacement method of structural analysis.
- f) What are forces developed in a prismatic member when a unit rotation (without translational displacement) is given to its one end and other end is fixed?
- g) Define the term Distribution Factor.
- h) What is an influence line? Discuss its applications.
- i) Explain how Muller Breaslar principle can be used for drawing influence line.
- j) What is basic difference between Portal method and Cantilever method of approximate analysis of frames?

SECTION-B

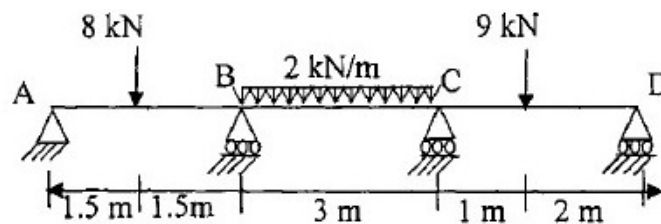
- 2) A cantilever beam AB of uniform stiffness is propped at end B. The span of the beam is L and it carries a udl of W kN/m. Calculate the deflection at the point where B.M is maximum on the span by the method of Consistent Deformation.
- 3) Using clapeyron's theorem, solve the continuous beam ABCD, 16 m long is continuous over three spans. Span AB = 6 m; BC = 5 m and CD = 5 m. EI is constant throughout.



- 4) A 2-hinged parabolic arch has a span of 100 m and a rise of 25 m. It carries a uniformly distributed load of 20 kN/m intensity of the horizontal span over its left half span. Determine the reactions and draw bending moment diagram. Take $I = I_0 \sec \theta$.
- 5) A beam ABC 10 m long is shown below. Use Slope Deflection method to compute the end moments and plot the bending moment diagram. The beam has constant EI for both the spans.

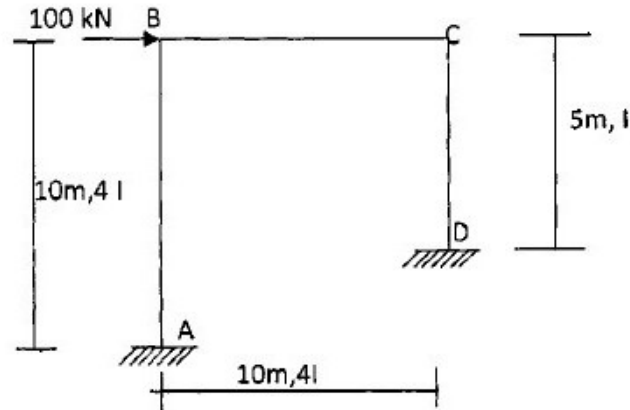


- 6) A horizontal beam ABCD is carried on simply supports and is continuous over three equal spans of 3 m. All the supports are initially at the same level. The loading on the beam is shown below. Analyse the beam using moment distribution method if the settlement of support A, B and C are 10mm, 30 mm and 20mm respectively. The moment of inertia of whole beam is $2.4 \times 10^6 \text{ mm}^4$. Take $E = 2 \times 10^5 \text{ N/mm}^2$.

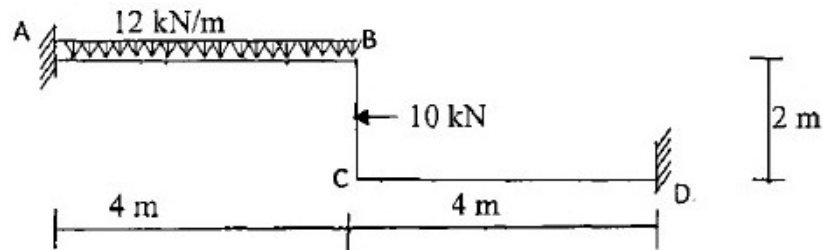


SECTION-C

- 7) A portal frame ABCD is fixed at A and D and has rigid joints at B and C. The frame is loaded as shown below. Analyse the frame using Slope Deflection method and draw bending moment diagram. Take EI constant.



- 8) A portal frame ABCD is fixed at A and D. The frame is loaded as shown below. It carries a point load of 10 kN at centre of BC. Analyse the frame using Moment Distribution method and draw bending moment diagram.



- 9) Analyse the building frame subjected to horizontal forces by using Portal Method.

