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Total Pages : 05

BT/5/D-18

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STRUCTURAL ANALYSIS-III

CE-301E

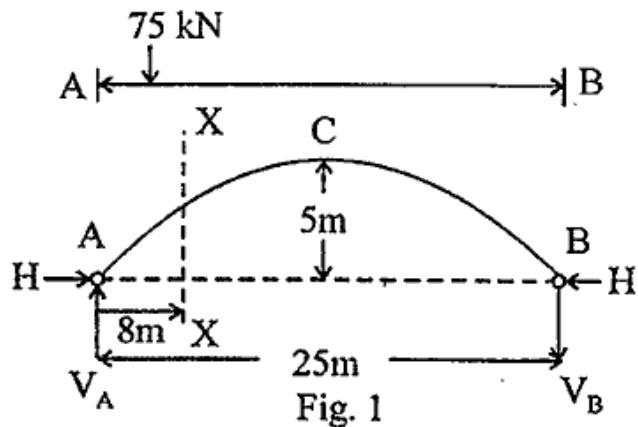
Time : Three Hours]

[Maximum Marks : 100]

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

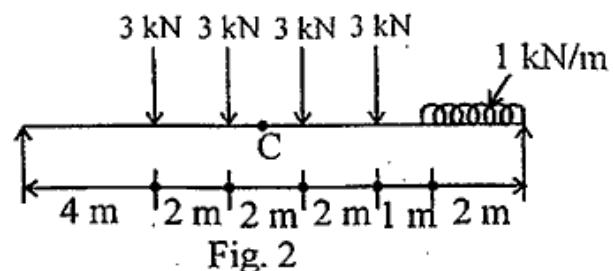
Unit I

1. A parabolic arch hinged at its springs and crown has a span of 25 m. The central rise of the arch is 5 m. Determine the magnitude of maximum positive and negative bending moment at a section of 8 m from left hand support, when a point load of 75 kN rolls over the beam. Refer Fig. 1. 20

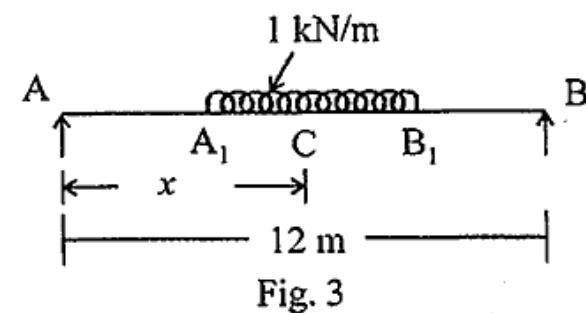


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2. A simply supported girder has a span of 20 m and is traversed by moving loads as shown in Fig. 2. Determine the maximum B.M. at 8 m from the left end support. 20

**Unit II**

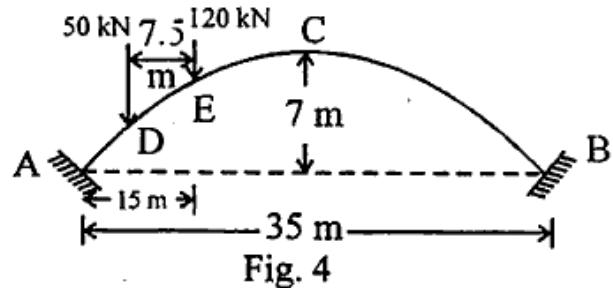
3. A uniformly distributed load of 1 kN/m run 6 m long crosses a girder of 16 m span. Construct shear force and bending moment diagram and calculate the values at 3, 5, and 8 m from left hand support Fig. 3. 20



4. A parabolic arch fixed at both ends has a span of 35 m and central rise of 7 m. It is subjected to concentrated

load of 50 kN and 120 kN at 7.5 m and 15 m from left hand support-respectively. The moment of inertia of the arch rib varies at the secant of the inclination of rib axis. Analyse the arch and find the B.M. at either support at the crown Refer Fig. 4.

20



Unit III

5. A continuous beam ABCD consists of three spans and is loaded as shown in Fig. 5 Find 'A' and 'D' are hinged. Determine the B.M. using Kani's method. Also plot the B.M.D. and deflected shape of beam.

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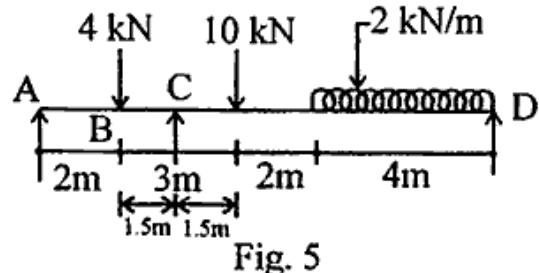


Fig. 5

6. Analyse the portal frame as shown in Fig. 6 by Kani's method. Draw B.M.D. and sketch the deflected shape of the frame. EI is constant for all the members.

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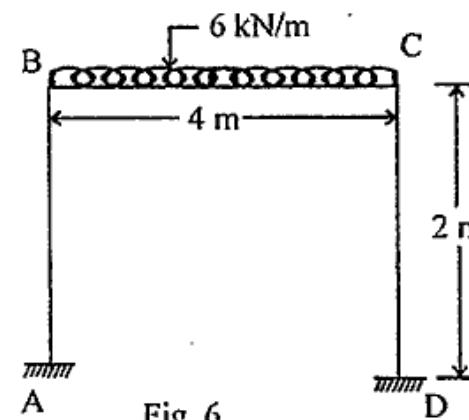


Fig. 6

Unit IV

7. Using cantilever method analyse the building frame subjected to horizontal forces as shown in Fig. 7. Sketch the bending moment diag.

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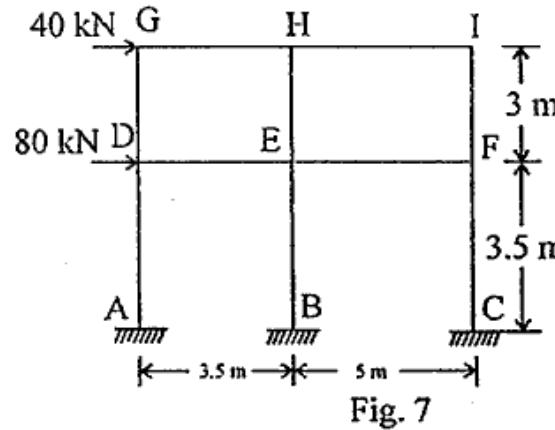


Fig. 7

8. Development flexibility matrix for the pin jointed plane frame with reference to coordinates 1, 2 and 3 as shown in Fig. 8 Axial flexibility of each member of the frame is 0.02 mm/kN.

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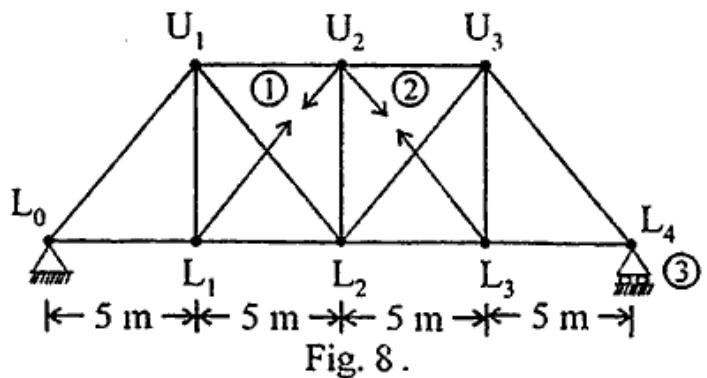


Fig. 8 .

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