[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2123)

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B. Tech 5th Semester Examination

Structural Analysis-II (O.S.)

CE-5001

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt Five Questions in all. Select One Question each from Section A, B, C, and D. Section-E (Question No. 9) is COMPULSORY. All questions carry equal marks. Use of Non-programmable calculator is allowed.

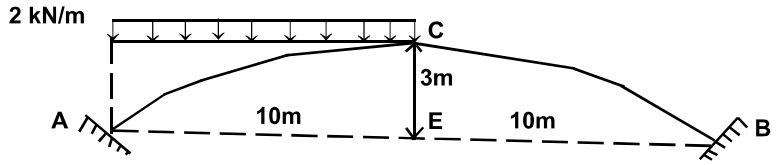
SECTION - A

1. A uniformly distributed load of 15 kN/m intensity and 5 m length moves over a simply supported girder of 24 m span. Calculate the maximum shear force and the maximum bending moment at a section 4 m from the left support. Plot the diagrams of the maximum shear force and the maximum bending moment. **(20)**

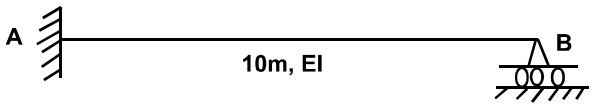
2. A three hinged parabolic arch has a span of 50 m and a rise of 10 m. Using the influence lines, determine the maximum positive and maximum negative bending moment, at the section 20 m from the left support, when a point load of 200 kN moves across the span from the left to the right of the span. Also determine the absolute maximum value of the bending moment and locate the section where it occurs. Also draw the influence line diagrams for horizontal thrust at the supports, normal and transverse shear at the section 20 m from the left support. **(20)**

SECTION - B

3. Analyze the fixed arch by elastic centre method. **(20)**

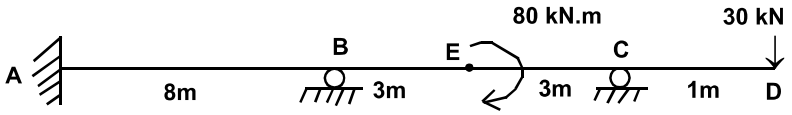


4. Draw the influence line for moment at A for the propped cantilever. Compute the ordinates at interval of 1.25 m. **(20)**



SECTION - C

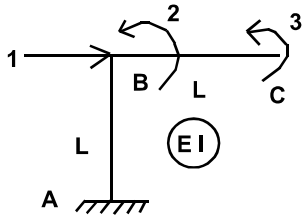
5. Determine the support moments for the continuous beam shown below. EI is constant. Use Kani's Method. **(20)**



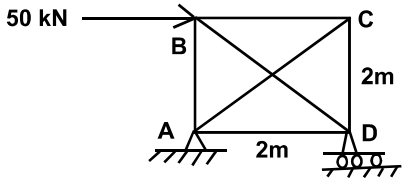
6. Explain Cantilever Method for approximate analysis of frames. **(20)**

SECTION - D

7. Develop the stiffness matrix and flexibility matrix in terms of coordinates 1, 2 and 3 for a cantilever bent shown below. **(20)**



8. Analyze the pin-jointed frame by the flexibility method. Hence determine the force in member AC. All members have the same cross-sectional area. **(20)**



SECTION - E (COMPULSORY)

9. (a) Define absolute maximum bending moment.

(b) Define an influence line. State its advantages.

(c) Define an arch. How an arch differs from a beam ?

(d) Clearly state Muller-Breslau Principle.

(e) Define Rotation Factor and Displacement Factor.

(f) Clearly state the assumptions made in the Portal Method of structural analysis.

(g) Define Stiffness Coefficient and Flexibility Coefficient.

(h) Differentiate between Global axis and Local axis.

(i) Differentiate between three hinged and two hinged arches.

(j) What are Rolling Loads? **(10×2=20)**