

Name of the Examination: B.Tech. (End Semester, Year November-2023)

Branch: Civil Engineering

Semester: IIIrd

Course Name: Determinate Structures

Course Code: -CE-211

Time Allowed: 3 Hours

Maximum Marks: 50.00

(Note: All Questions are compulsory and distribution of marks are shown in all questions)

- Q-1 Analyze the cantilever truss hinged at A and roller at C as shown in Figure-1. The nodes are having co-ordinates as A (0, 3), B (3, 3), C (0, 0), D (3, 0) and E (6, 0). Use any method for analysis and find the vertical deflection at D by unit load method. For each member, the axial stiffness (AE) can be assumed to be constant. (10.0 Marks)

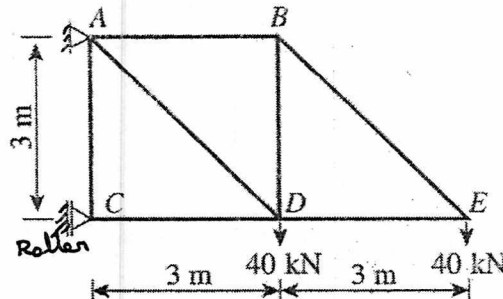


Figure 1

- Q-2 Find the slope at ends (A & D) and deflection at point B in the simply supported beam as shown in Figure-2. Let the Flexural stiffness for AB and CD is EI and for portion BC is $3EI$. (10.0 Marks)

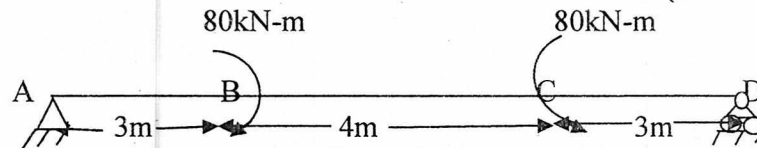


Figure 2

- Q-3 A beam ABC is supported at A, B and C, and has an internal hinge at D distant 3m from A, $AB = 6m$ and $BC = 6m$ as shown in figure-3. Draw the influence lines for:- (10.0 Marks)

- Reactions at A, B and C
- S.F. at a point just to the right of B
- B.M. at a section 1 m to the right of B

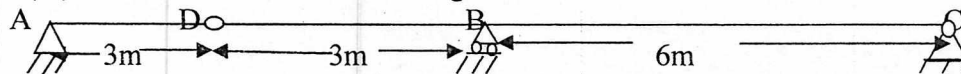


Figure 3

- Q-4 (a) Explain Eddy's theorem? (3.0 Marks)

(b) Find the deflection at centre of span in a simply supported beam of span ' L ' subjected to a point load ' P ' at the centre of span. Use Unit Load Method. Let EI is constant for the whole span. (7.0 Marks)

- Q-5 (a) Derive the general cable equation. (3.0 Marks)

(b) A three hinge parabolic arch has a horizontal span of ' L ' with a central hinge with a central rise of ' r '. Determine the influence line for support reactions, vertical shear force and bending moment at a distance ' y ' from one support. (7.0 Marks)