Code No: **19CET403** **R19**

II B. TECH II SEMESTER REGULAR EXAMINATIONS, AUGUST 2021
STRUCTURAL ANALYSIS - I
(CIVIL ENGINEERING)

Time: 3 hours Max. Marks: 60

Note: Answer **ONE** question from each Unit (**5 × 12 = 60 Marks)**

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UNIT - I

1. a) Analyse the propped cantilever beam loaded as shown in the Fig-1. Draw the S.F.D and B.M.D. Assume EI constant throughout. [8M]

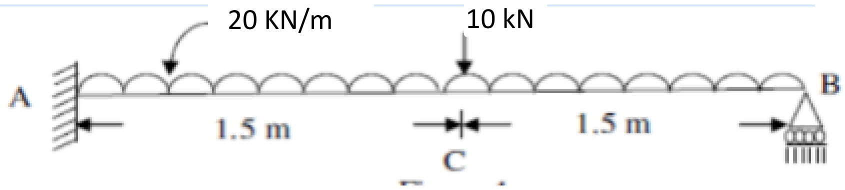

Fig-1

b) What is a propped cantilever and what is its degree of indeterminacy? [4M]

(OR)

2. Find the maximum bending moment and locate the point of inflection for a propped cantilever beam of span 8 m due to a uniformly varying load, whose intensity is 10 kN/m at the fixed support and 2 kN/m at the simple support. [12M]

UNIT – II

3. Write down the Step-by-step procedure determining the bending moment for fixed beam. [12M]

(OR)

4. A beam AB of uniform section and 5 m span is built at the ends. A U.D.L of 20 kN/m runs over left half of the span and there is an additional concentrated load of 10 kN at right quarter. Determine the fixed end moments at the ends and the reaction. Draw BMD and SFD. [12M]

UNIT – III

5. a) A continuous simply supported beam ABC consists of two consecutive spans AB and BC 4 m each and carries a distributed load of 60kN/m. The moment of inertia is I throughout the span. Analyse the beam and Also draw shear force and bending moment diagrams. [8M]

b) How Clapeyron's theorem of three moments can be applied to a fixed beam? [4M]

(OR)

6. A continuous simply supported beam ABC covers two consecutive spans AB and BC of length 6 m and 8 m, carrying loads of 10 kN/m and 15 kN/m respectively. The moment of inertia is I throughout the span. Analyse the beam and Also draw shear force and bending moment diagrams. [12M]
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UNIT –IV

7. A continuous beam ABC covers two consecutive spans AB and BC of length 6 m and 8 m, carrying loads of 10 kN/m and 15 kN/m respectively. If the ends A and C are simply supported, find the support reactions at A, B and C. Use slope deflection method. Draw the shear force and bending moment diagram. Draw elastic curve. [12M]

(OR)

8. a) A beam ABC of length 16m consists of spans AB and BC each 8m long and is simply supported at A,B and C. The beam carries a UDL of 40kN/m on the whole length. Find the reactions at the supports and the support moments by slope deflection method. [8M]

b) Write down the expression for slope deflection method [4M]

UNIT –V

9. A UDL of intensity 2KN/m and 5m long crosses a simply supported girder of 20m span. [12M]

i) Maximum shear force and Maximum bending moment at a section 8m from the left support.

ii) Absolute maximum bending moment.

(OR)

10. a) Draw the influence line diagram for a simply supported beam. [8M]

i) Shear force at any section.

ii) Bending Moment at any section.

iii) Reaction at a support .

b) What is the condition for absolute maximum bending moment due to moving UDL longer than span ? [4M]

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