

Printed Pages – 7

Roll No. :

320551(20)

B. E. (Fifth Semester) Examination, April-May 2021

(New Scheme)

(Civil Engg. Branch)

STRUCTURAL ANALYSIS-II

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Part (a) from each question is compulsory and are carry equal 2 marks. Attempt any one parts from (b) and (c) of each unit and carries equal 14 marks. Assume suitable data if necessary.

Unit-I

1. (a) State principle of superposition. Elaborate with the help of example.
- (b) Determine the reaction components for fixed beam and draw B. M. D. using method of consistent deformation.

[2]

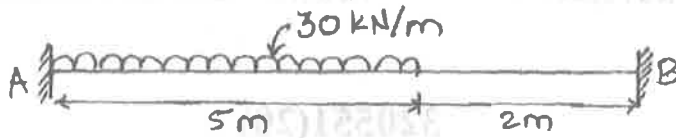


Fig. (1)

- (c) A continuous beam $ABCD$ is loaded as shown in fig. If support C sinks by 8 mm downward calculate moments and draw bending moment diagram.

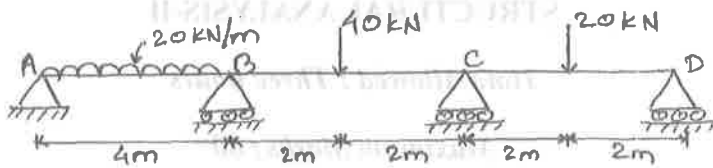


Fig. (2)

Unit-II

2. (a) State Castigliano's first theorem and second theorem. Elaborate with the help of example.
- (b) Using the method of Strain Energy (Principle of Least work) analyse the portal frame as shown in fig. Also plot the BMD.

320551(20)

[3]

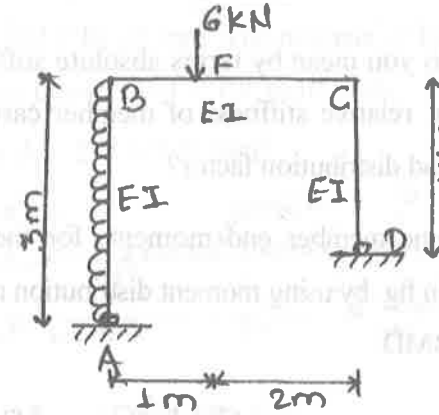


Fig. (3)

- (c) Compute the reaction and force in the members if the truss shown in fig. $\frac{L}{AE}$ is constant for all members.

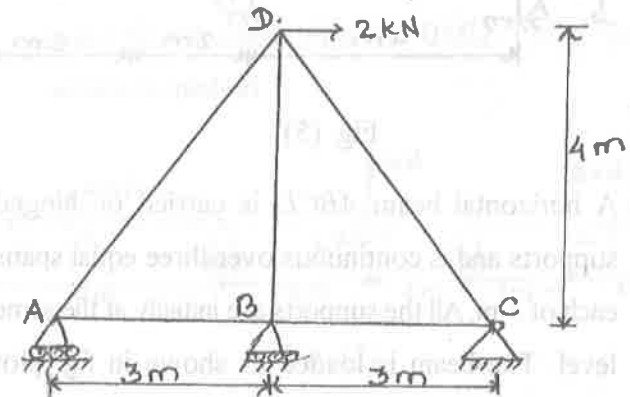


Fig. (4)

320551(20)

P.T.O

PTO

[4]

Unit-III

3. (a) What do you mean by terms absolute stiffness of member, relative stiffness of member carry over factor and distribution factor?
- (b) Determine member end moments for the frame shown in fig. by using moment distribution method. Draw BMD.

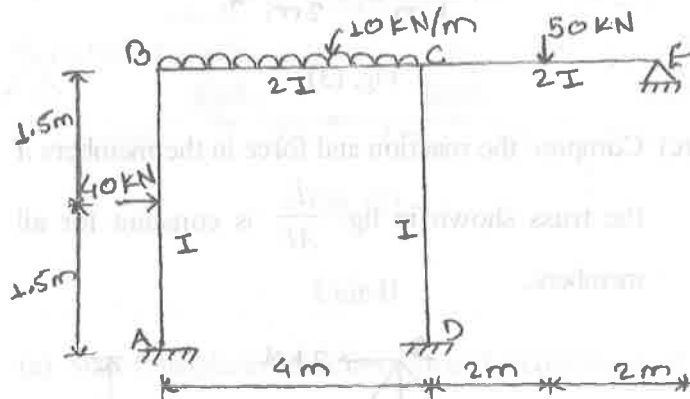


Fig. (5)

- (c) A horizontal beam ABCD is carried on hinged supports and is continuous over three equal spans each of 3 m. All the supports are initially at the same level. The beam is loaded as shown in fig. plot BMD and sketch the deflected shape of the beam

320551(20)

[5]

if the support A settles by 10 mm. B settles by 30 mm and C by 20 mm. The moment of Inertia of the whole beam is $2.4 \times 10^6 \text{ mm}^4$ units.

Take $E = 2 \times 10^5 \text{ N/mm}^2$

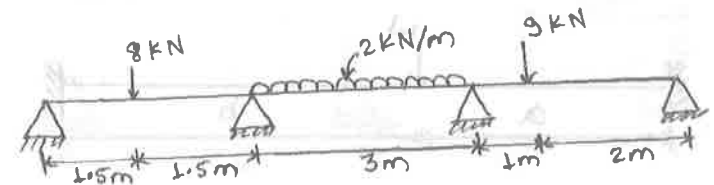


Fig. (6)

Unit-IV

4. (a) Enumerate the assumption used in slope deflection method.
- (b) A continuous beam is loaded as shown in fig. Ends A and D are fixed. Plot the BMD. Using slope deflection method.

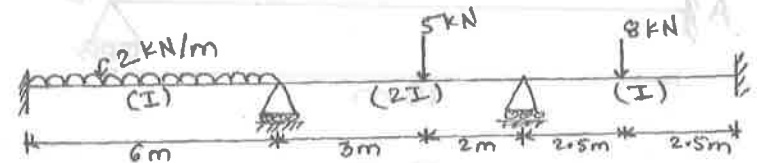


Fig. (7)

320551(20)

PTO

[6]

- (c) Using column analogy method. Determine the end moments in a fixed beam of span, L , subjected to a concentrated load W at distance a from end A .

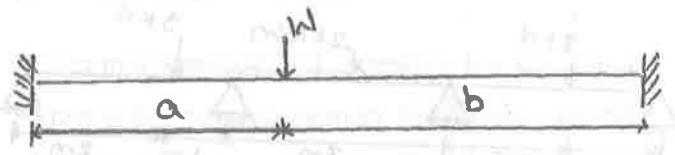


Fig. (8)

Unit-V

5. (a) Explain Muller-Breslau Principle.
 (b) Draw the influence line for reaction at B and for the support moment M_A at A for the propped cantilever in fig. Compute the influence line ordinates at 1.5 m intervals.

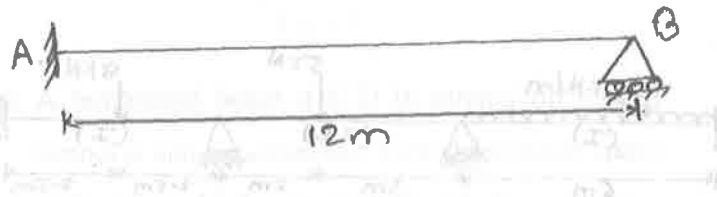


Fig. (9)

- (c) Determine the influence line for bending moment at

[7]

- D , mid point of span BC of a continuous beam as shown in fig. Compute the ordinates at 1 m interval. EI is constant.

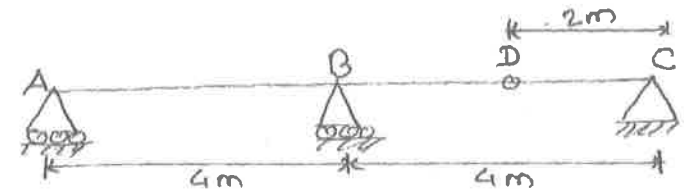


Fig. (10)