

**320511(20)**

**B. E. (Fifth Semester) Examination,  
April-May 2020**

**(Old Scheme)**

**(Civil Engg. Branch)**

**(Specialization : Civil Engineering)**

**STRUCTURAL ANALYSIS-II**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note : Assume suitable data where necessary and mention it clearly. Part (a) of each question is compulsory. Attempt any one from part (b) and (c) in each questions.***

**Unit-I**

1. (a) Explain externally indeterminate Beam. 2
- (b) A beam AB of span 4 m is fixed at A and B it

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carries a point load of 15 kN at a distance of 1 m from end A. Calculate the support moment of consistent deformation. 14

- (c) Draw the bending moment diagram and shear force diagram for the beam shown in Fig.-1 using three moment theorem. 14

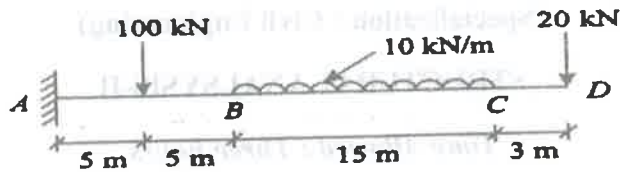


Fig. 1

### Unit-II

2. (a) What is lac of pit? 2
- (b) A beam AB of span 3 m is fixed at both the end carries a point load of 9 kN at C distance 1 m from A. The moment of inertia of the portion AC of the beam is  $2I$  and that of portion CB is  $I$ . Calculate the fixed end moment and reaction by strain energy methods. 14

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- (c) Find the horizontal deflection at B and rotation at C of frame shown in fig.-2 : 14

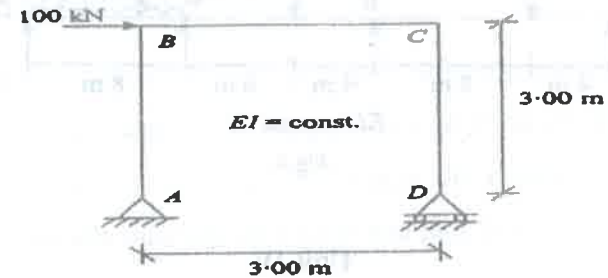


Fig. 2

### Unit-III

3. (a) What is 'carry over' in moment distribution method? 2
- (b) A horizontal beam ABCD is carried on hinge support and is continuous over three equal spans of 3 m. All the supports are initially at the same level as shown in Fig. 3. Plot the bending moment diagram and sketch deflection shape if support A settled by 10 mm, B settle by 30 mm and C settled by 20 mm.  $E = 2 \times 10^5 \text{ N/mm}^2$ ,  $I = 2.4 \times 10^6 \text{ mm}^4$  units. 14

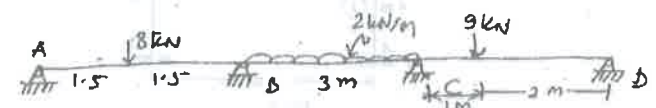


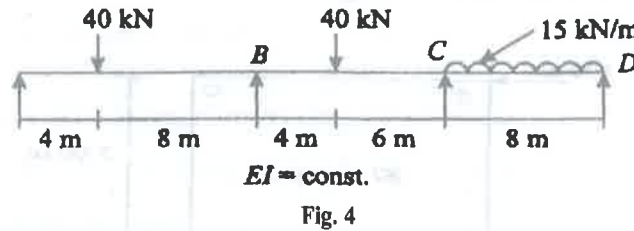
Fig. 3

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- (c) Analyse the beam shown in Fig. 4 by moment distribution method and draw BMD and SFD. 14



Unit-IV

4. (a) What is sinking of support and its impact on structure analysis. 2
- (b) A beam AB of span L is fixed at A and B which carries a point load W at a distance 'a' from A and 'b' from B. Calculate support moments using column analogy method. 14
- (c) Analyse the frame as shown in Fig. 5 using slope deflection method. 14

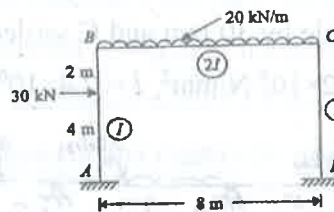


Fig. 5

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Unit-V

5. (a) Differentiate between bending moment diagram and influence line diagram. 2
- (b) Using Muller-Breslau principle, draw the influence line diagram for bending moment at D for the Fig. 6 shown below and determine the ordinates at suitable intervals of 0.50 m and plot them. 14

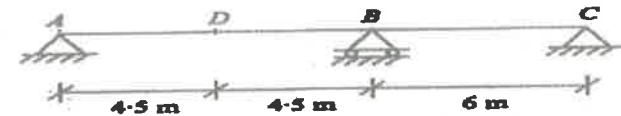


Fig. 6

- (c) Draw IL for reaction at 'B' for the propped cantilever beam shown in Fig. 7 as below. Compute ordinate at 1.5 m interval. 14

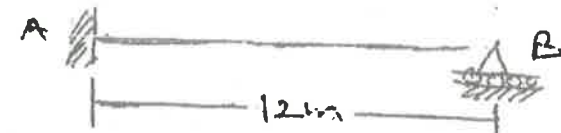


Fig. 7

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