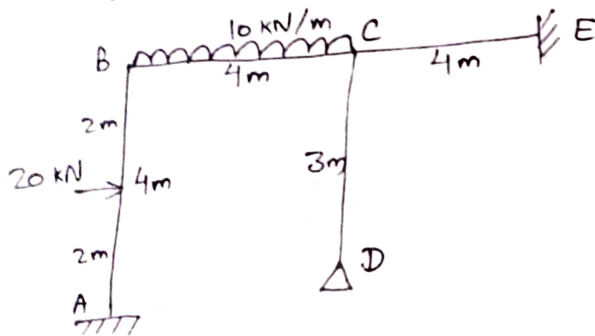9. Analyse the frame by slope deflection method. **15**

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B. Tech. 4th Semester (Civil)
Examination – July, 2021
STRUCTURAL ANALYSIS
Paper : PCC-CE-206-G

Time : Three hours]   [*Maximum Marks* : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. **1** is *compulsory*. All questions carry equal marks.

1. (a) Describe the Maxwell's law of reciprocal deflections. $3 \times 5 = 15$

   (b) Explain portal frames and its types.

   (c) Describe the temperature effect on three hinged arch.

   (d) Differentiate between statically determinate and indeterminate structures.

   (e) Explain Stiffening Girder and its types.

P. T. O.

SECTION – A

2. Describe Williot Mohr diagram in details.　　15

3. A horizontal girder of steel having a uniform section is 14 m long and is simply supported at its ends. It carries concentrated loads of 120 kN and 80 kN at sections 3 m and 4.5 m from the left end and right end respectively. Find the slope and deflection under the loads and the slopes at each end.　　15

$$\text{Take } EI = 3.36 \times 10^{11} \text{ kN/mm}^2$$
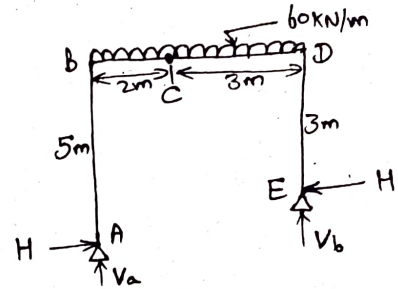
SECTION – B

4. For the given beam draw the influence line diagram for the following : (i) reaction V_b at B, (ii) reaction V_a at A, (iii) reacting moment M_a at A, (iv) shear force at D and (v) bending moment at D. Also find the maximum values of these due to a live load of 20 kN/m.　　15
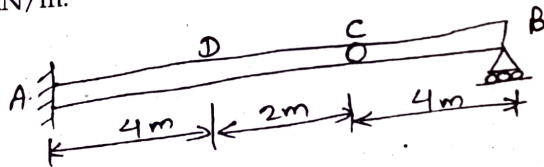
5. Two wheel loads 30 kN and 20 kN, 3m apart cross a girder of 9 m span with the 15 kN load leading from left to right. Draw the max. shear and max. bending moment diagrams.　　15
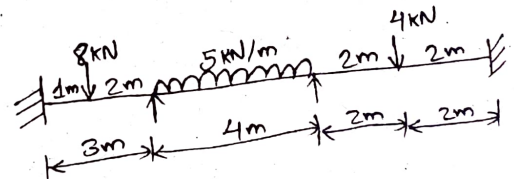
SECTION – C

6. Analysis the given frame. Draw the B.M. diagram for this :　　15

7. A fixed beam of span l carries a point load W at mid span. Determine the fixed end moments. The beam is of uniform section.　　15

SECTION – D

8. Determine the support moments at A, B, C and D for continuous girder.　　15

P. T. O.