

Roll No.

3082

**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.

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P. T. O.

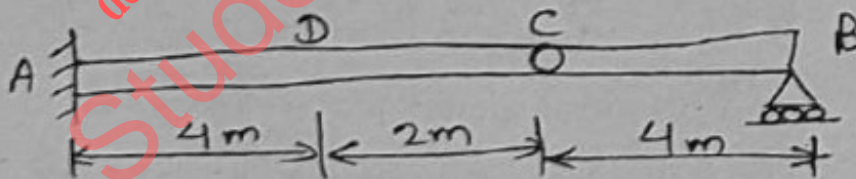
SECTION – A

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

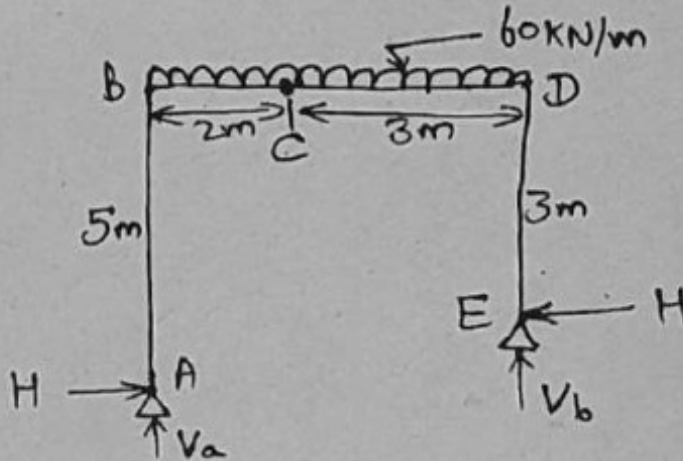
4. For the given beam draw the influence line diagram for the following : (i) reaction V_b at B, (ii) reaction V_a at A, (iii) reacting moment M_a at A, (iv) shear force at D and (v) bending moment at D. Also find the maximum values of these due to a live load of 20 kN/m. 15



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

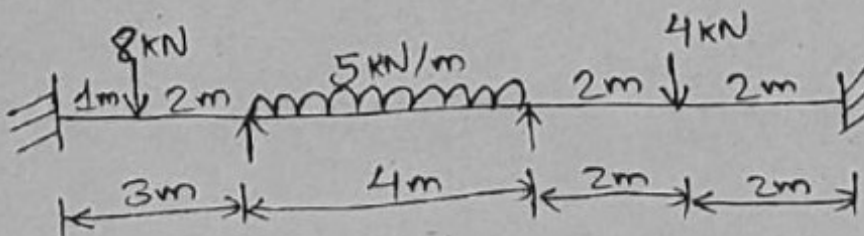
6. Analysis the given frame. Draw the B.M. diagram for this : 15



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



9. Analyse the frame by slope deflection method.

15

