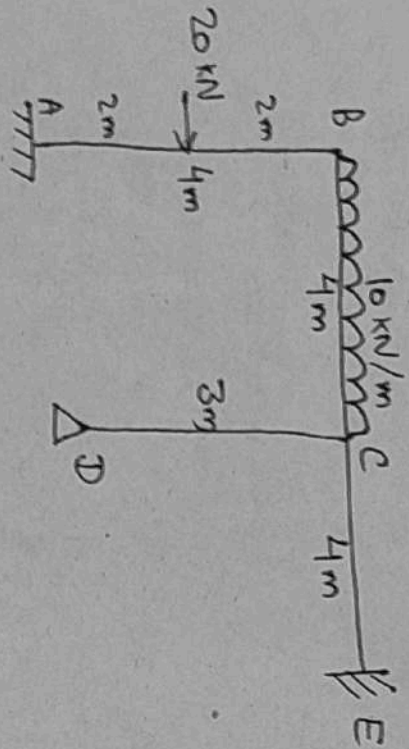


9. Analyse the frame by slope deflection method. 15



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.

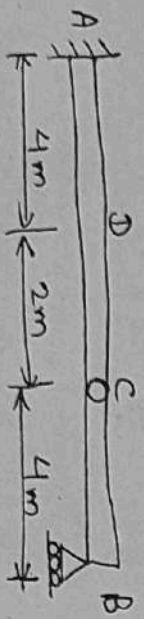
**SECTION - A**

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

Take  $EI = 3.36 \times 10^{11}$  kN/mm<sup>2</sup>

**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

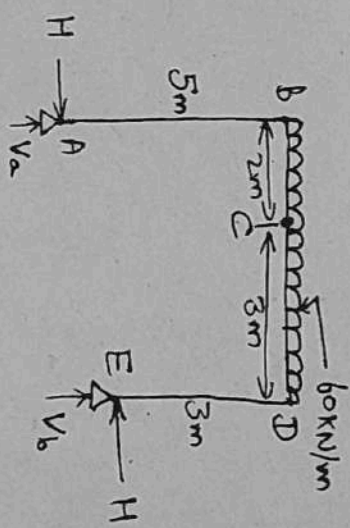


5. Two wheel loads 30 kN and 20 kN, 3m apart cross a girder of 9 m span with the 15 kN load leading from left to right. Draw the max. shear and max. bending moment diagrams. 15

3082-1750-(P-4)(Q-9)(21) (2)

**SECTION - C**

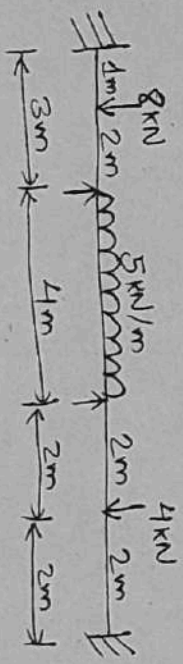
6. Analysis the given frame. Draw the B.M. diagram for this : 15



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



3082-1750-(P-4)(Q-9)(21) (3)

P. T. O.