Code No. 11529 / CBCS

FACULTY OF ENGINEERING

B.E. (Civil) VI – Semester (CBCS) (Main) Examination, April / May 2019

Subject: Theory of Structures – II

Time: 3 Hours Max.Marks: 70

Note: Answer all questions form Part-A and any five questions from Part-B

PART – A (10x2 = 20 Marks)

1 Define influence line diagram and write the uses of the influence line diagram.

2 An U.D.I of intensity 20 kN/m and length 5 m, crosses a simply supported girder of span 20 m calculate the EUDELL.

3 Draw the influence line diagram for the force in the bottom chord member of 3 rd panel in the 6 panelled warren truss.

4 Calculate the length of suspension cable of span 100 m and central dip of 4 m supports of the cable are at the same level.

5 Define flexibility coefficient and write the properties of flexibility coefficient matrix.

6 Determine the flexibility matrix for a fixed beam by treating the end moments as redundant.

7 Define kinematic indeterminacy. The kinematic indeterminacy of a fixed beam is _____.

8 Develop the stiffness matrix for the beam shown in Fig. 1.

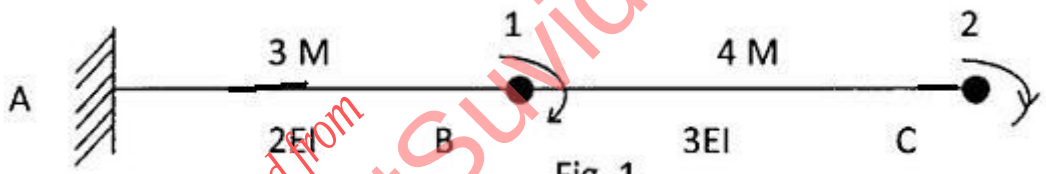

Fig. 1

9 Name two software used in the field of structural analysis.

10 Develop the stiffness matrix for 2 noded beam elements with 3 Degrees of freedom at each node.

PART – B (5x10 = 50 Marks)

11 An uniformly distributed load of intensity of 15 kN/m of length 6 m crosses a simply supported girder of span 20 m. Find the maximum bending moment and shear force at a section 5 m from the right support. Also determine the absolute maximum bending moment and shear force in the girder.

12 The wheel loads shown in Fig. 2 roll over a beam of span 15 m. Find the maximum bending moment @ 5m section from the left end. Also, determine the position and magnitude of absolute maximum B.M. in the girder.

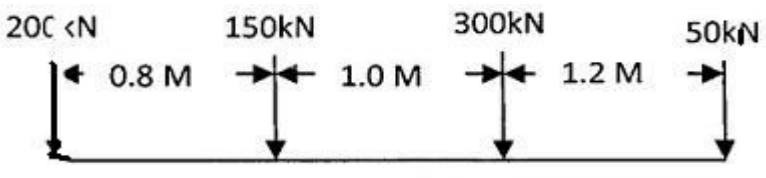

Fig. 2

..2

13 Construct the influence line diagram for forces in the members U_1U_2, L_1L_2 for the truss shown in Fig. 3. Hence calculate the forces in these members due to a dead load of 20 kN/m and moving live load of 30 kN/m which is longer than the span. Take each panel 6 m width each, members U_1L_1 = 3m and U_2L_2 = 5m.

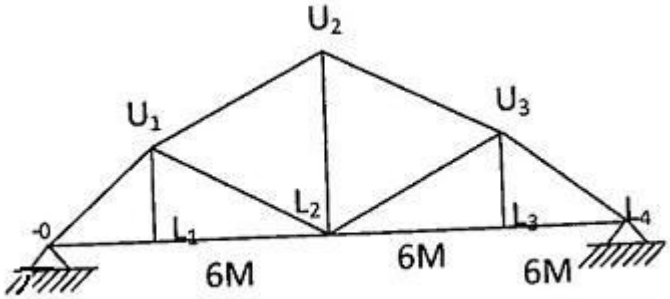

Fig. 3

14 A suspension bridge of 100 m span has a three hinged stiffening girder supported by cables having a central dip of 10 m. The left half of the span of the bridge is loaded with uniformly distributed load of intensity 25 kN/m. Determine the reactions and draw the bending moment and shear force diagram for the stiffening girder.

15 Analyse the beam shown in Fig. 4 using flexibility method and draw the BMD. Assume EI is the same for all the members.

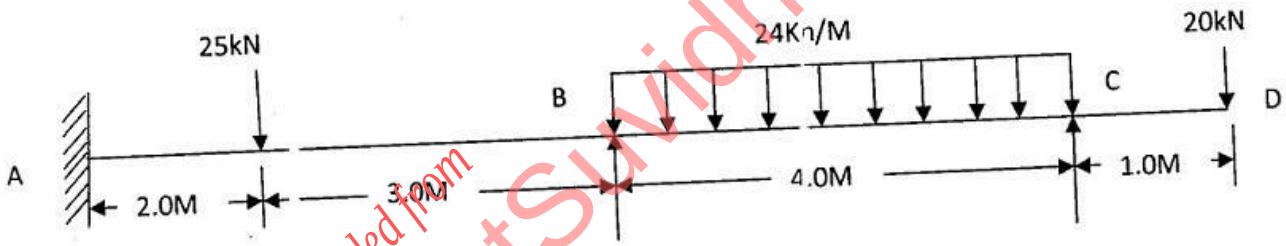

Fig. 4

16 Analyze the plane truss shown in Fig. 5 using stiffness matrix approach.

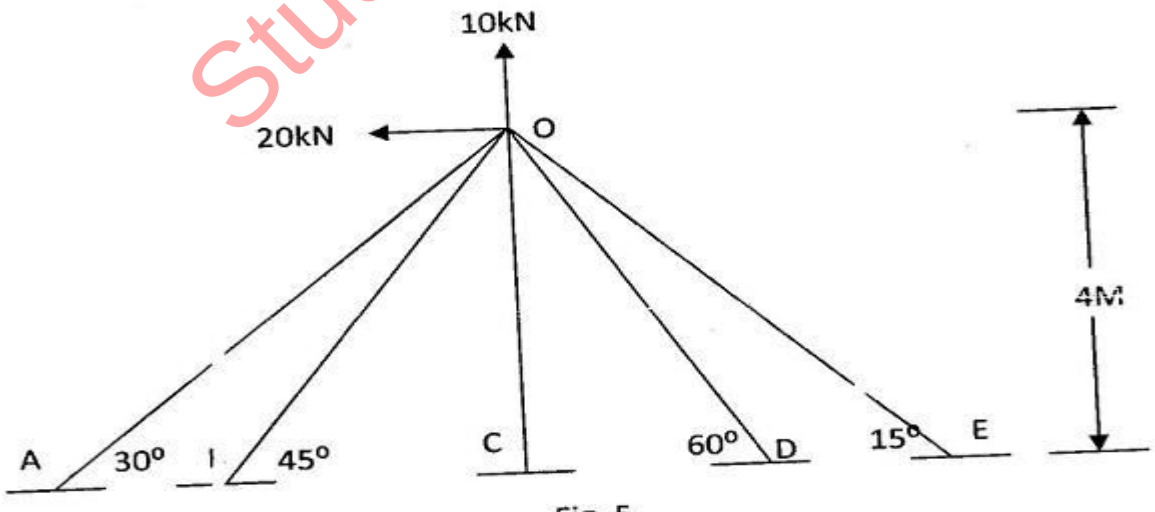

Fig .5

17 Analyze the following continuous beam shown in Fig. 6 by either flexibility or stiffness method if the support …B€ sinks down by 10mm. Take E = 200 GPa and I = $1.35 \times 10^{-3} m^4$. Also draw BMD.

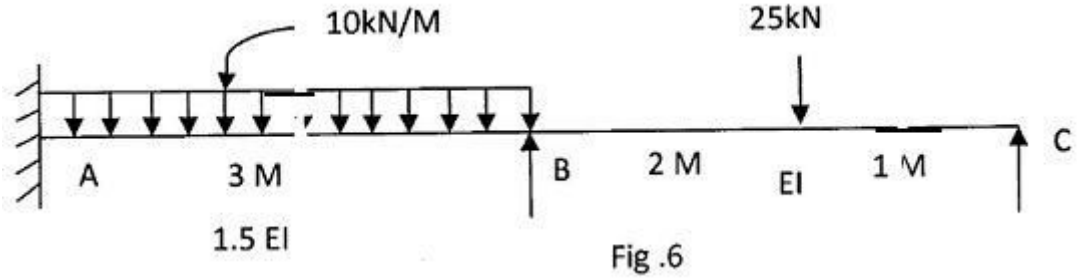

Fig .6

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