R16

Code No: 134CE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2019

STRUCTURAL ANALYSIS

(Common to CE, CEE)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

PART-A

(25 Marks)

1.a) Distinguish between statically determinate and indeterminate with examples. [2]
b) Write down the compatibility condition for a fixed beam. [3]
c) Define Perfect, Imperfect and Redundant Frames. [2]
d) State the assumptions are made in analysis of truss. [3]
e) Explain:
i) Strain Energy
ii)Complimentary strain energy
iii) Minimum Potential energy. [2]
f) List out different types of arches. [3]
g) Define Elastic Curve. [2]
h) State the assumptions are made while developing slope deflection method. [3]
i) Define Muller Breslau's principle. [2]
j) Define influence in line and state advantage of ILD. [3]

PART – B

(50 Marks)

2. Analyze the propped cantilever shown in Figure 1 and draw BMD and SFD. [10]

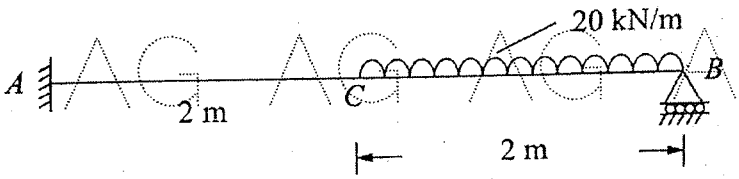

Figure: 1

OR

3. A fixed beam AB span 10 metre carries point load 180kN and clockwise moment of 160kN at a distance 3m and 6m from left end respectively. If the left support sinks by 15mm, find the fixed end moments and reactions at the supports. Take EI = 6000kNm^2. [10]

4. Determine the forces in all members of truss shown in Figure 2 by method of joints. [10]

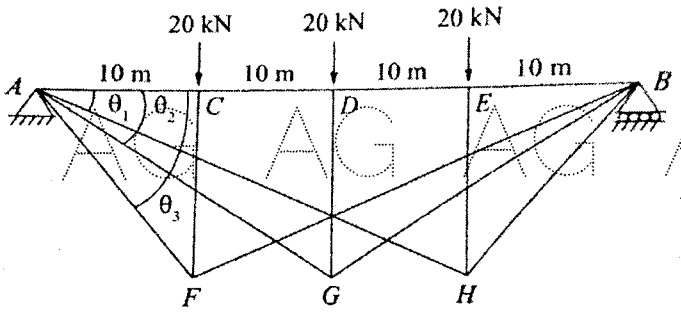

Figure: 2

OR

5. Find the forces in the members ED, EF and FG for the truss shown in Figure 3. Use the method of section. [10]

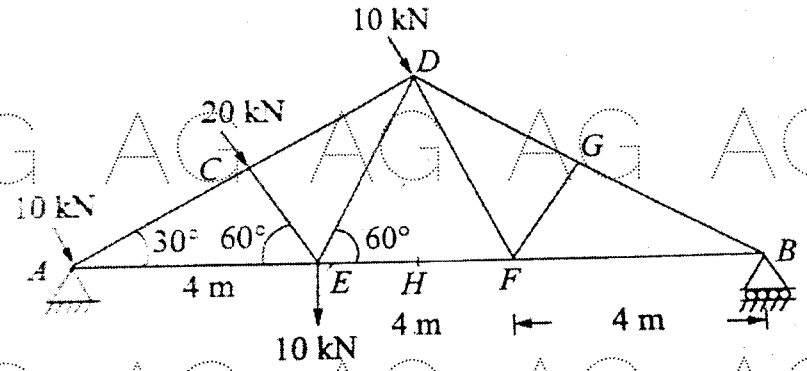

Figure: 3

6. Determine the vertical and horizontal deflection at the free end of bent shown in Figure 4 by unit load method. Take EI as constant throughout. [10]

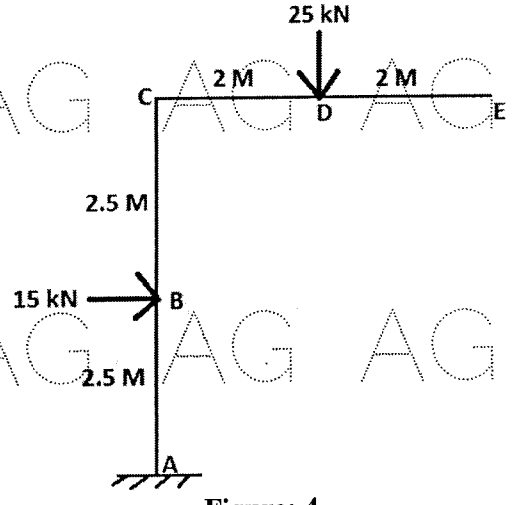

Figure: 4

OR

7. Determine the radial shear, normal thrust and BM at 4m from left support for three hinged arch shown in Figure 5. [10]

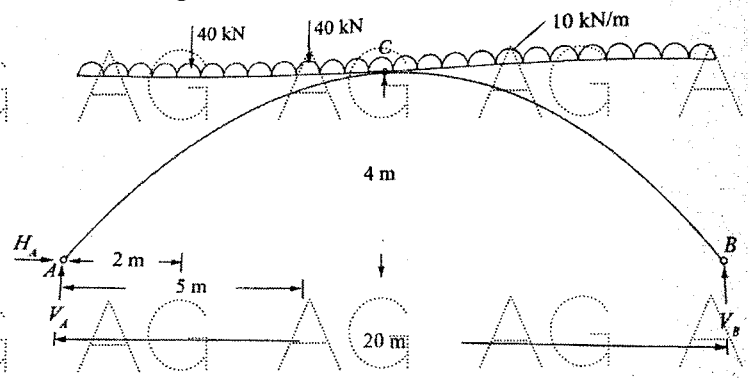

Figure: 5

8.a) Derive the slope deflection equations.

b) Analyse the frame shown in Figure 6 by slope deflection method. Draw BMD. [5+5]

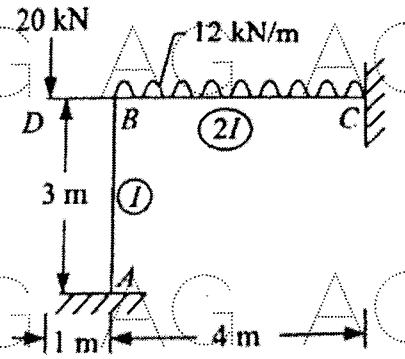

Figure: 6

OR

9. Analysis the continuous beam shown in Figure 7 by moment distribution method. Assume EI is Constant. [5+5]

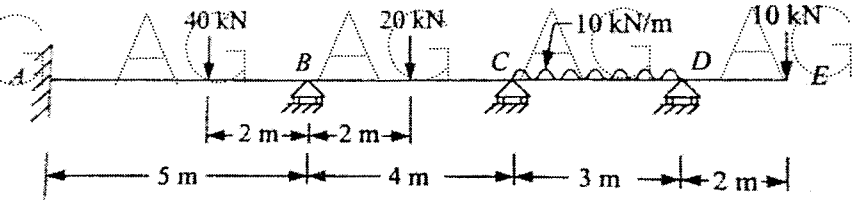

Figure: 7

10. A train of concentrated loads shown in Figure 8 moves from left to right on a simply supported girder of span 20 m. Determine the absolute maximum shear force and bending moment developed in the beam. [10]

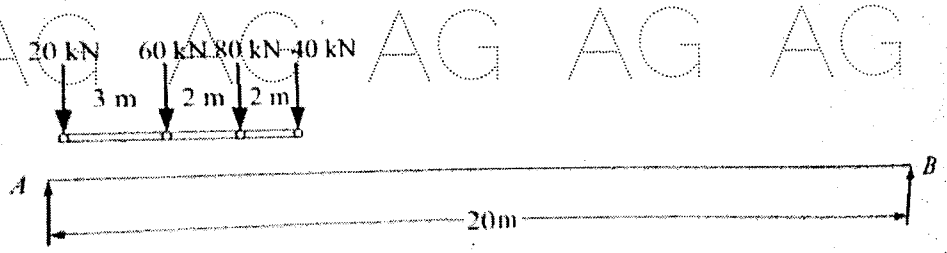

Figure: 8

OR

11. An N Girder of span 18 m has to be designed for the member forces X, Y and Z. Draw the influence line diagram for the member forces shown in figure 9. [10]

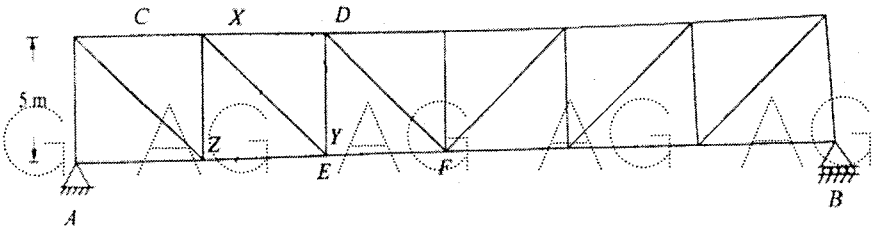

Figure: 9

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