Code No: 114DQ

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2016

STRUCTURAL ANALYSIS-I

(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, c as sub questions.

PART- A

(25 Marks)

1.a) Distinguish between simple and compound truss. [2]
b) Define 'Tension coefficient'. [3]
c) What are the limitations of Castigliano's theorem? [2]
d) Explain Eddy's theorem. [3]
e) What is a propped cantilever beam? What is its static indeterminacy? [2]
f) How fixed beams can be made statically determinate? [3]
g) What is column shear condition? [2]
h) List the reasons for sides way of the portal frame. [3]
i) Distinguish between influence line diagram and bending moment diagram. [2]
j) What is the condition for absolute max. bending moment due to moving 'udl' longer than the span? [3]

PART - B

(50 Marks)

2. Determine the forces in the truss by method of sections shown in figure 1. [10]

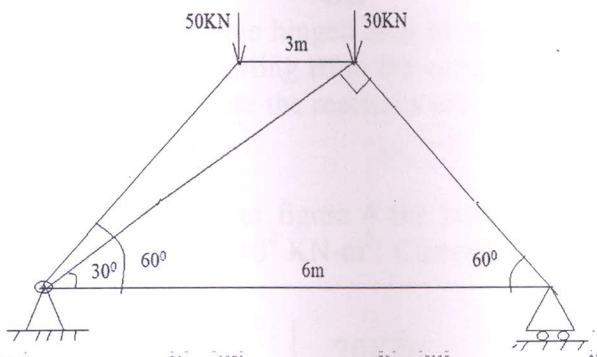

Figure: 1

OR

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

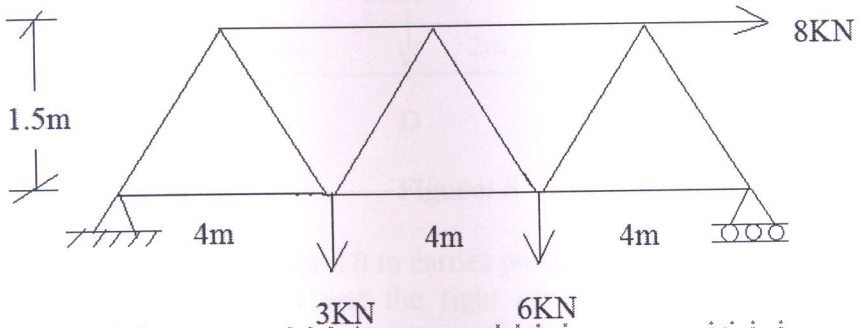

Figure: 2

4. The bend ABC shown in figure 3 carries a concentrated vertical load 'P' at A. Find the vertical and horizontal deflections of 'A'. Assume uniform flexural rigidity. [10]

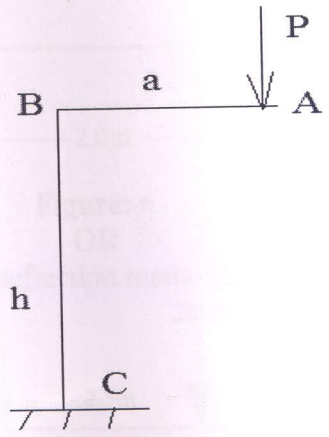

Figure: 3

OR

5. A symmetrical parabolic three hinged arch of span 30 m and rise 5 m carries an udl of intensity 20 kN/m starting from the central hinge and runs over for 10 m towards right hinge. Calculate the reactions also normal thrust and radial shear at quarter span. [10]

6. For the fixed beam shown in figure 4 the left support of the beam rotates by 0.03 radians clockwise. EI=10^4 KN-m^2. Compute the fixed end moments. Draw BMD. [10]

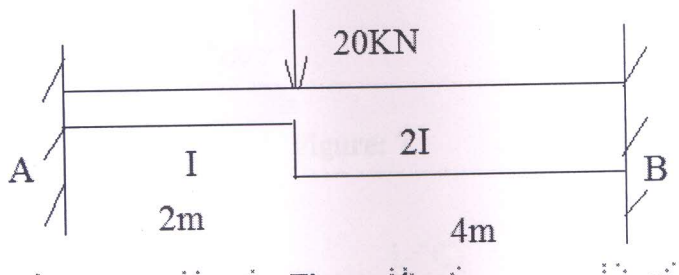

Figure: 4

OR

7. Determine the reactions of the propped cantilever beam shown in figure 5 and draw BMD. [10]

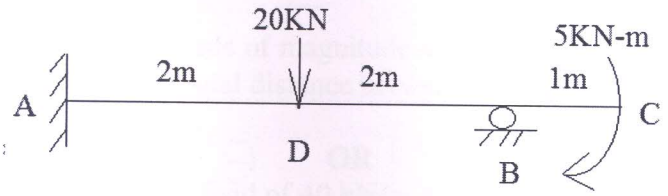

Figure: 5

8. A Fixed beam AB of span 6.0 m carries point loads 150 kN and 200 kN as shown in figure 6. If the left and the right supports sink by 15 mm and 7 mm respectively, find the fixing moments at the supports. Find also the reactions at supports. Draw also the BMD for the beam by using Moment distribution method. Take EI=6000 kN-m^2. [10]

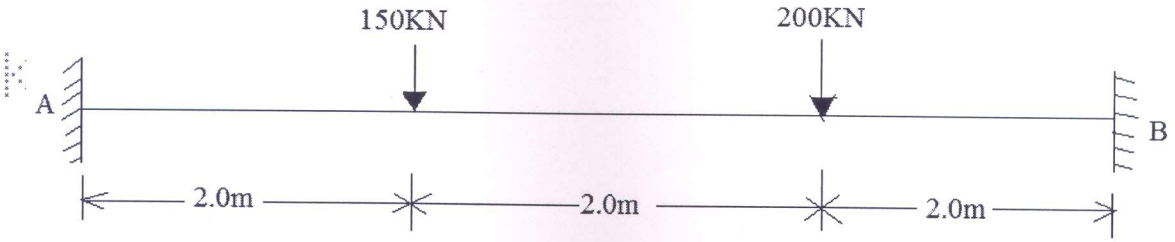

Figure: 6

OR

9. Analyse the frame by Slope -deflection method as shown in Figure 7. [10]

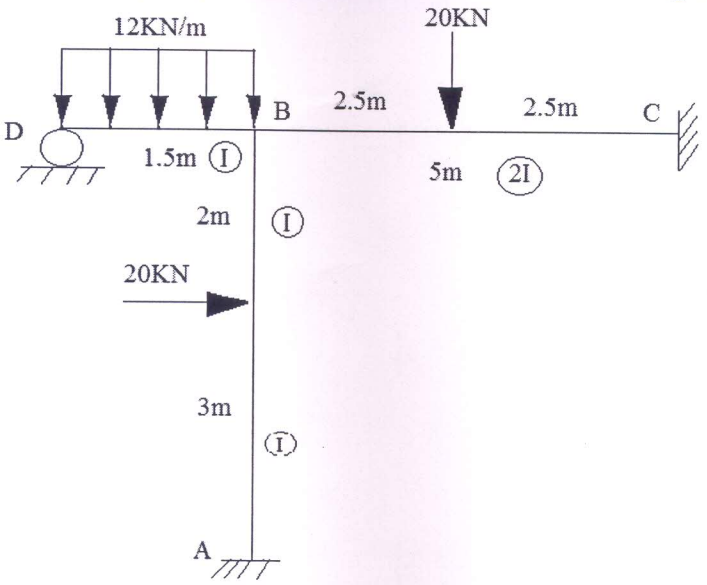

Figure: 7

10.a) An uniform load of 2000 N/m, 5 m long crosses a girder of 20 m span from left to right. Calculate the Max. Shear force and bending moment at a section 8 m from left hand support.

b) A train of three wheel loads of magnitude 45 kN, 90 kN and 90 kN passes over a span of 40 m. The horizontal distance between the loads is 5 m and 10 m. Find the greatest bending moment. [5+5]

OR

11. An uniformly distributed load of 40 kN/m and of length 3 m transverse across the span of simply supported length of 18 m. Compute the maximum bending moment at 4 m from the left support and absolute bending moment. [10]

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