Code No: 154CB

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester (Special) Examinations, January/February - 2021
STRUCTURAL ANALYSIS – I
(Civil Engineering)

Time: 2 Hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks

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1. Using the method of sections, determine the force in the members 1, 2 and 3 of a plane truss supported and loaded as shown in Figure 1. [15]

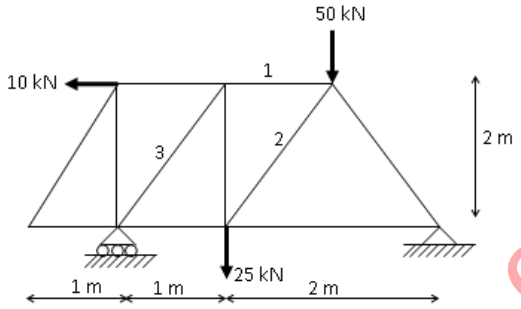

Figure: 1

2. Using tension coefficient method, analyse the plane truss supported and loaded as shown in Figure 2. [15]

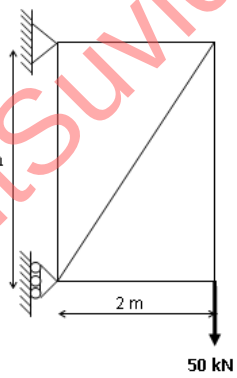

Figure: 2

3. Using unit load method, determine the vertical deflections at the joint C of a steel pin-jointed frame subjected to a concentrated load of 20 kN as shown in Figure 3. All the members have the same cross-sectional area = 500 mm^2. [15]

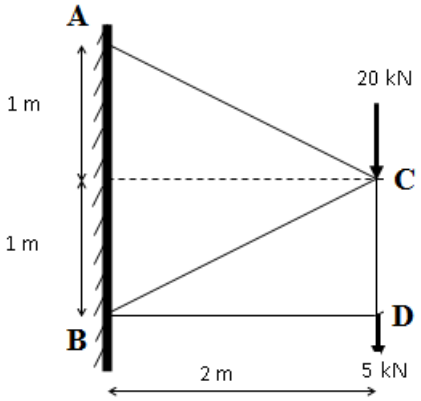

Figure: 3

4. A three-hinged parabolic arch of span 24 m has central rise of 5 m is subjected to two concentrated loads 60 kN and 25 kN at a distance of 8 m and 10 m from left hinge and uniformly distributed load of 150 kN/m on the right half of the span. Find the horizontal thrust and bending moment at a section 9 m from the left support. [15]

5. Analyse and draw the shear force diagram for a beam supported and loaded as shown in Figure 4. [15]

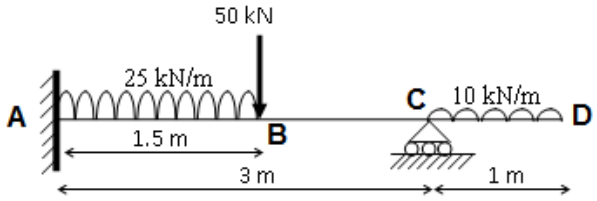

Figure: 4

6. Analyse and draw the bending moment diagrams for a fixed beam supported and loaded as shown in Figure 5. [15]

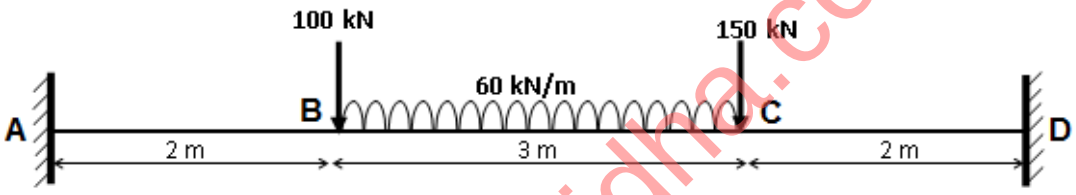

Figure: 5

7. Analyse and draw BMD for the continuous beam supported and loaded as shown in Figure 6, if the support B sinks by 10 mm. Use Clapeyorn's theorem of three moments. Adopt E = 200 GPa and I = 75×10^6 mm^4. [15]

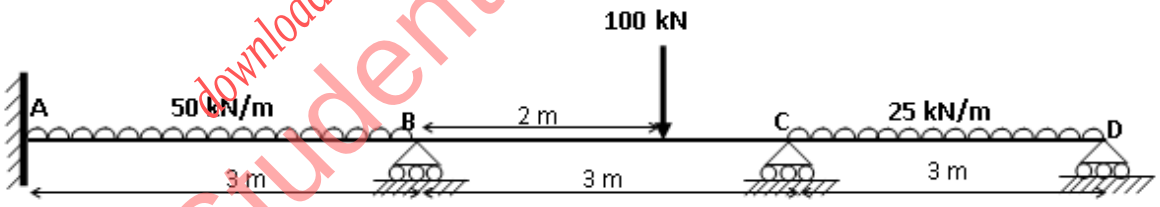

Figure: 6

8. An uniformly distributed load of intensity 25 kN/m, 4 m long crosses a simply supported girder of span 16 m from right to left. Calculate the maximum positive and negative shear forces at a section 6 m from the left support. [15]

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