

R18

Code No: 154CB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year II Semester Examinations, August/September - 2021

STRUCTURAL ANALYSIS – I

(Civil Engineering)

Time: 3 Hours

Max. Marks: 75

**Answer any Five questions
All questions carry equal marks**

1. Determine the forces in the members of the pin-jointed truss shown in figure 1. [15]

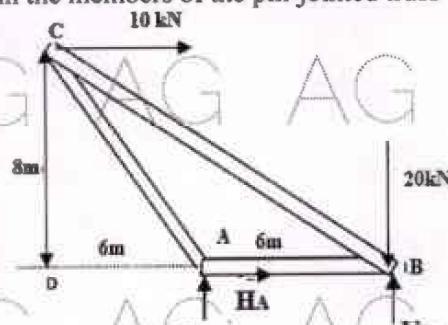


Figure: 1

2. Determine the forces in all the members of the truss shown in figure 2 by using method of joints. [15]

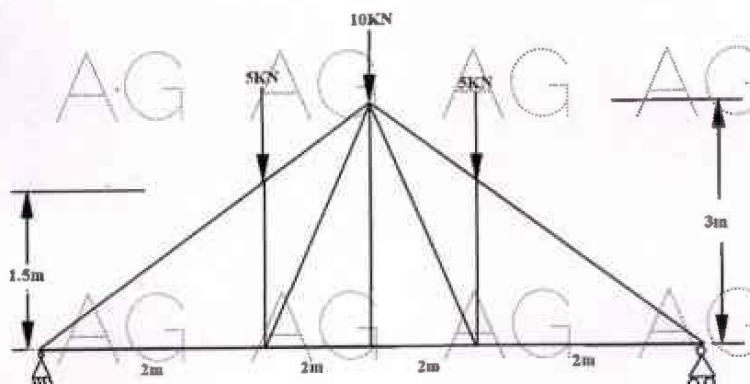


Figure: 2

3. A mild steel bar 100mm diameter is bent as shown in figure 3. It is fixed horizontally at A and a load of 500N hangs at D. Draw the bending moment diagram for the parts AB, BC and CD, indicating the maximum values. Find the maximum bending stress. Find also the deflection at D. Take $E = 2 \times 10^5 \text{ N/mm}^2$. [15]

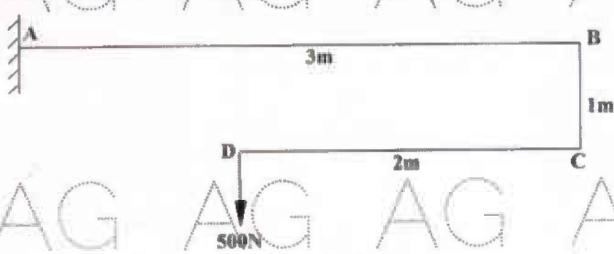


Figure: 3

4. A three hinged arch has span 20m and a rise 4m. The arch carries a uniformly distributed load of 20KN/m on the left half of the span. Find the horizontal thrust at each support and location and magnitude of the maximum bending moment of the arch. [15]

5. Determine the prop reaction and the deflection at mid-span of a propped cantilever beam shown in figure 4. The prop sinks by 30mm. Take $EI = 15,000 \text{ KNm}^2$ [15]

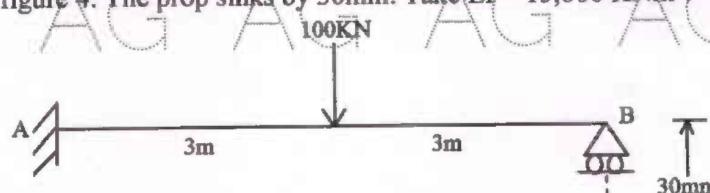


Figure: 4

- 6.a) Determine the fixed end moments for the loaded beam shown in figure 5. Draw also BMD for the beam of span 'l'.

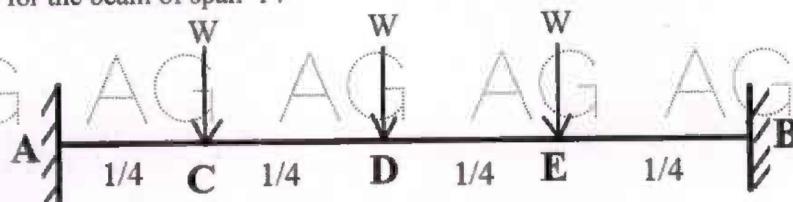


Figure: 5

- b) A beam 10m long fixed at both ends carries a uniformly distributed load of 4500N/m over the entire span. Find the maximum bending and maximum bending-deflection. Take $E = 200\text{KN/m}^2$, $I = 5 \times 10^7 \text{ mm}^4$ [18+7]

7. The support B of a continuous beam shown in figure 6 has settled by 12mm. Find out the moments at supports. [15]

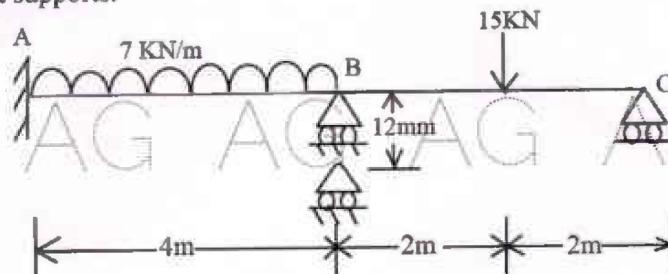


Figure: 6

8. Construct the influence line for a diagonal member U_5L_4 of a warren truss with verticals shown in figure 7. [15]

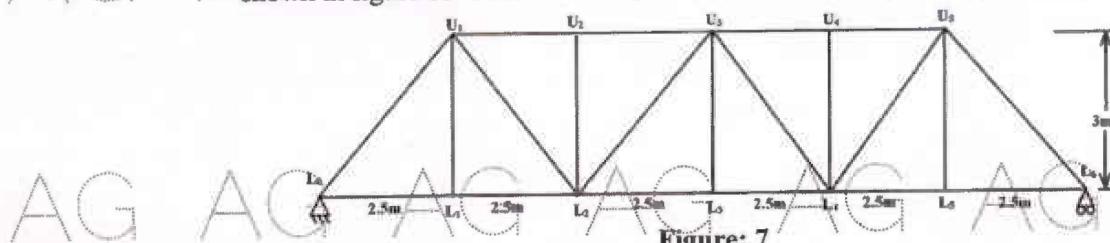


Figure: 7
---ooOoo---