R18

Code No: 154CB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester Examinations, March - 2022
STRUCTURAL ANALYSIS – I
(Civil Engineering)

Time: 3 Hours
Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1. Analyze the pin jointed truss as shown in figure 1 by the method of joints. [15]
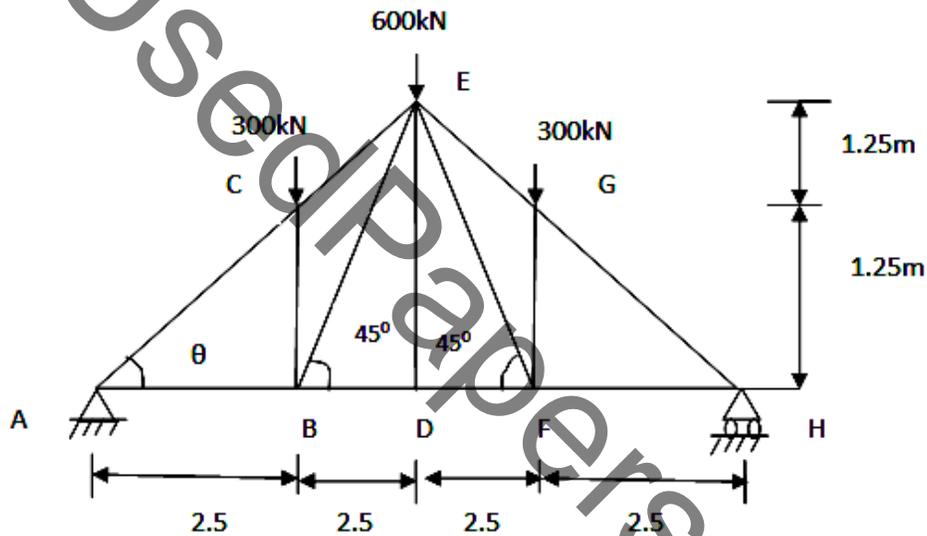

Figure: 1

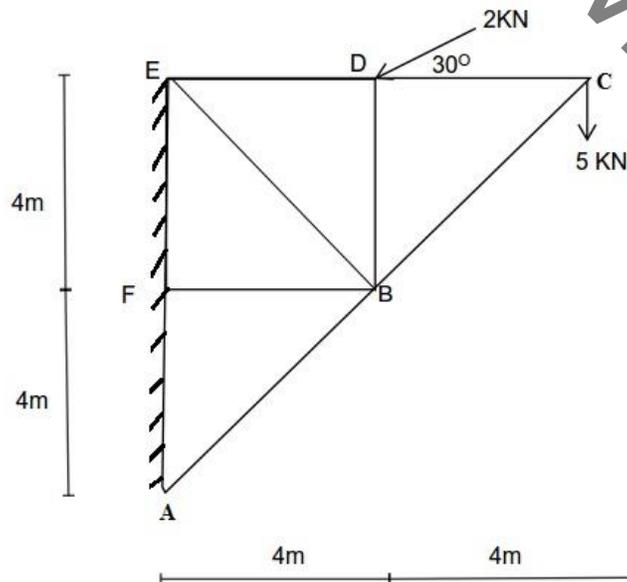2. Analyze the truss shown in figure 2 by method of sections. [15]

Figure: 2

3. An unsymmetrical 3-hinged parabolic arch is loaded as shown in figure 3. Locate the position of third hinge C and determine
a) Support reactions.
b) NT and RSF at section 'D' 10 m away from A.
c) Location and magnitude of maximum BM in portion CB
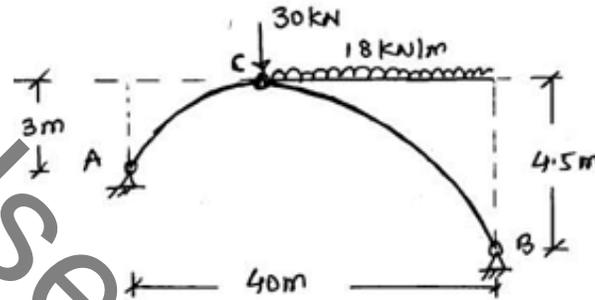Also draw BMD for the arch. [15]

Figure: 3

4. Determine the horizontal and vertical component of deflection at the Point 'C' of the frame shown in figure 4. Take $E=200\times10^3$ N/mm^2 and $I=6\times10^7$ mm^4. Use Strain Energy method. [15]
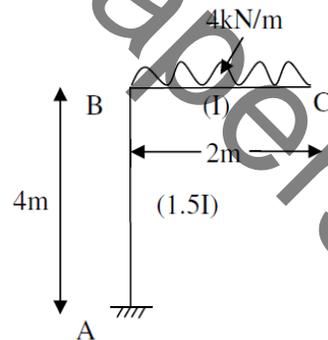

Figure: 4

5. A propped cantilever beam is shown in figure 5. Calculate the prop Reaction and also draw the BM and SF diagrams. [15]
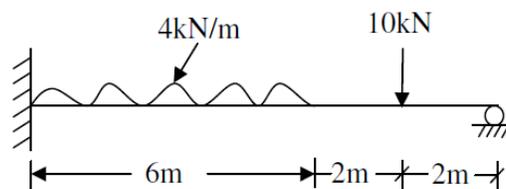

Figure: 5

6. A fixed beam AB of length 3 m carries a point load of 45 kN at a distance of 2 m from A. If the flexural rigidity is of the beam is 1×10^4 kNm^2, determine (a) the fixed end moments at A and B. (b) Deflection under the load and (c) maximum deflection. [15]

7.   ABC is a continuous beam with constant EI throughout its length. The end supports A and C are fixed and beam is continuous over middle support B. Span BC is uniformly loaded with 10 kN per metre length, while a concentrated vertical load of 100 kN acts at the mid span AB. Calculate the moments by slope deflection method.   [15]

8.   For the simply supported beam AB of span 5m subjected to a train of concentrated loads moving from left to right as shown in Figure 6. Using influence lines find the absolute maximum bending moment and the equivalent uniformly distributed load.   [15]
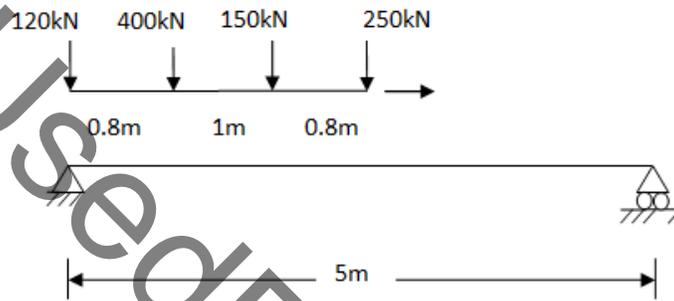

120kN   400kN   150kN   250kN

0.8m   1m   0.8m

5m

Figure: 6

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