R22

Code No: 185EM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, January - 2025
STRUCTURAL ANALYSIS – II
(Civil Engineering)

Time: 3 Hours **Max. Marks: 60**

Note: This question paper contains two parts A and B.
i) Part- A for 10 marks, ii) Part - B for 50 marks.

- Part-A is a compulsory question which consists of ten sub-questions from all units carrying equal marks.
- Part-B consists of ten questions (numbered from 2 to 11) carrying 10 marks each. From each unit, there are two questions and the student should answer one of them. Hence, the student should answer five questions from Part-B.

PART- A

(10 Marks)

1.a)	Define Stiffness.	[1]
b)	What is carry over moment?	[1]
c)	List out the different types of cable structures.	[1]
d)	Examine the true shape of cable structures.	[1]
e)	Briefly mention the two types of matrix methods of analysis of indeterminate structures.	[1]
f)	What are equilibrium equations?	[1]
g)	What are the basic unknowns in stiffness matrix method?	[1]
h)	What is the Stiffness Matrix Method?	[1]
i)	How is the influence line diagram for shear force determined for a continuous beam?	[1]
j)	What is the difference between influence line diagrams for simple and continuous beams?	[1]

PART - B

(50 Marks)

2. Using moment-distribution method, analyse the frame shown in Figure 1. Draw BMD. [10]

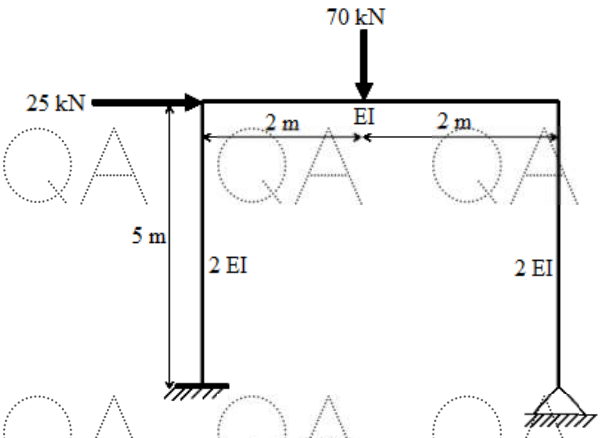

Figure 1

OR

3. Using Kani's method, analyse the continuous beam supported and loaded as shown in Figure 2, if the support 'C' settles by 10 mm. Assume $E = 2\times10^5\ N/mm^2$ and $I = 80\times10^{-6}\ m^4$. [10]

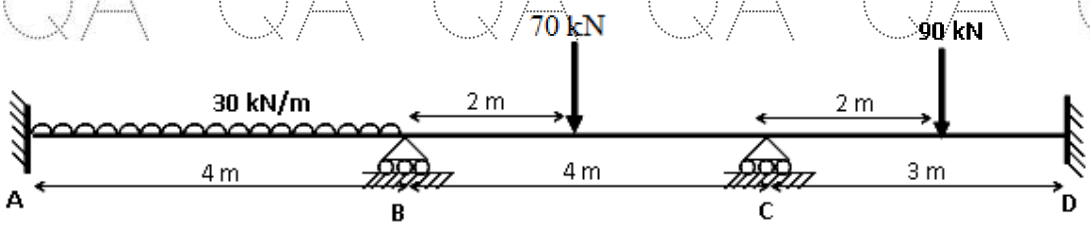

Figure 2

4. A suspension bridge of 120 m span has two numbers of three hinged stiffening girders supported by two cables with a central dip of 10 m. The width of the roadway is 6 m. The bridge is subjected to dead load is 6 kN/m^2 of floor area and live load of 10 kN/m^2 on the right half of the bridge. Determine the shear force and bending moment at a section distance of 30 m from the left end. Also find the maximum tension in the cable. [10]

OR

5. Using cantilever method, analyse the frame shown in Figure 3. Draw the bending moment diagram. Assume the geometrical and material properties are the same for the elements of the frame. [10]

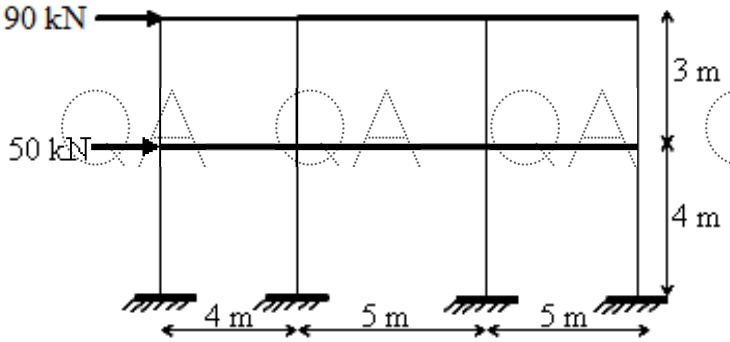

Figure 3

6. Analyse the frame shown in figure 4, using portal method. Also draw the B. M diagram. Assume the geometrical and material properties are the same for the elements of the frame. [10]

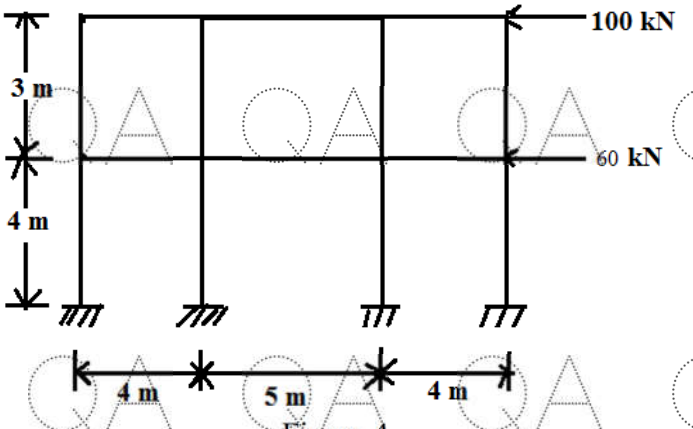

Figure 4

OR

7. Using stiffness method, analyse the beam supported and loaded as shown in Figure 5. Assume ***EI*** is constant. [10]

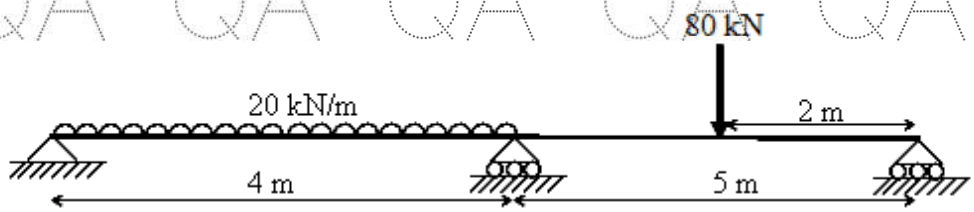

Figure 5

8. Analyse the pin-jointed plane frame supported and loaded as shown in Figure 6. Use flexibility method. [10]

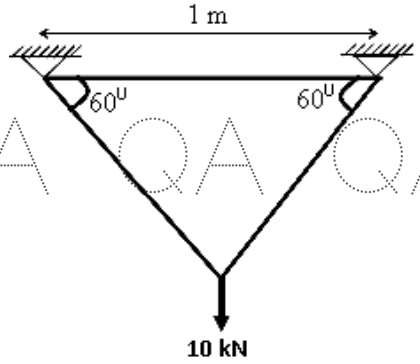

Figure 6

OR

9. Analyse the beam shown in figure 7 by Stiffness matrix method. [10]

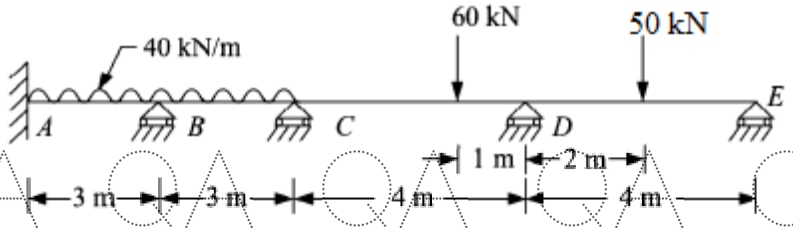

Figure 7

10. Draw the ILD for shear force and bending moment for a section at 50m from the left hand support of a simply supported beam, 200m long, hence calculate the maximum bending moment and shear force at the section due to an uniformly distributed rolling load of length 80m and intensity 100kN/m. [10]

OR

11. Draw the influence line diagrams for the reaction at the intermediate support and the bending moment at a section 4 m from the right support of a two-span continuous beam supported as shown in Figure 8. [10]

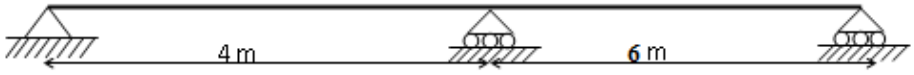

Figure 8

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