Code: 15A01505

R15

B.Tech III Year I Semester (R15) Supplementary Examinations June 2018

STRUCTURAL ANALYSIS - II

(Civil Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

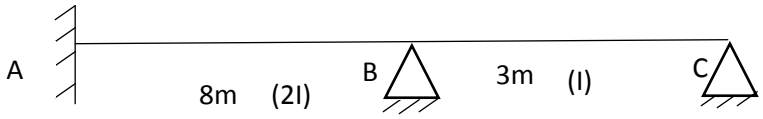
(a) Write the formulae for the horizontal thrust for two hinge arch carrying udl throughout the span and Point load at crown.

(b) Find the horizontal thrust for a three hinged parabolic arch carrying a point load of W at its crown.

(c) Explain Rib Shortening effect in the arches.

(d) Compare the moment distribution method and Kani's method.

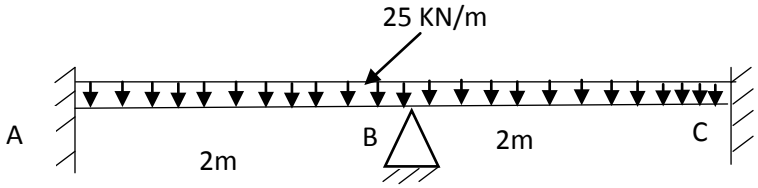
(e) Determine the Rotation factor of all the members for the continuous beam shown in figure below.



(f) Explain the difference between local stiffness and global stiffness matrix.

(g) Distinguish between static indeterminacy and kinematic indeterminacy?

(h) Determine the slope at the joint B for the Continuous beam shown in figure below.



(i) Write the values of shape factor for (i) Circle and (ii) Diamond

(j) Define Plastic Modulus.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

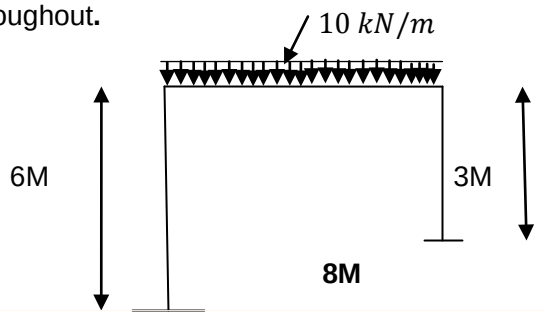
2 A two hinged parabolic arch has a span of 50 m and rise 12 m. A concentrated load of 8kN acts at 15m from the left support .Calculate the horizontal thrust, maximum bending moment at 15m from left support

OR

3 A three-hinge circular arch of span 12M and rise of 5M having supports at same levels, carries a UDL of intensity 36KN/m over the left half span and a concentrated load of 64 KN at a section 5 m from the right support. Determine the horizontal thrust developed. Find the Normal thrust and Radial Shear for the arch.

UNIT – II

4 Analyse the frame shown in fig below using Moment Distribution Method and draw the bending moment diagram. EI is constant throughout.



OR

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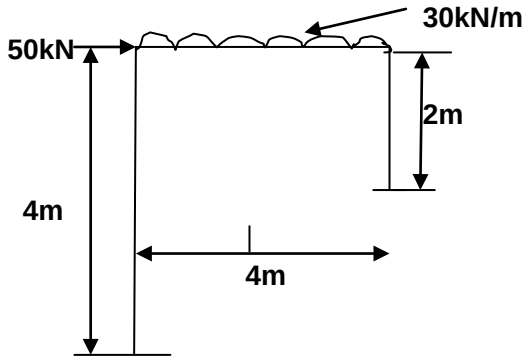
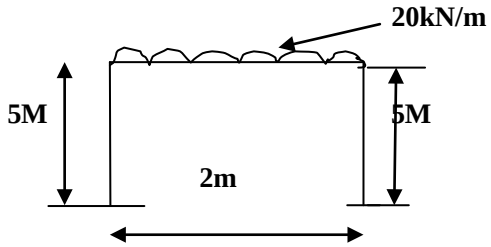
5 Analyse the frame as shown in fig below using slope deflection method and sketch the bending moment diagram. $2I_{AB}=I_{BC}=2I_{CD}=I$.



UNIT – III

6 Analyse the frame as shown in fig below using Kani's method and sketch the bending moment diagram?



OR

7 Analyse the frame as shown in fig below using Kani's method and sketch the bending moment diagram?

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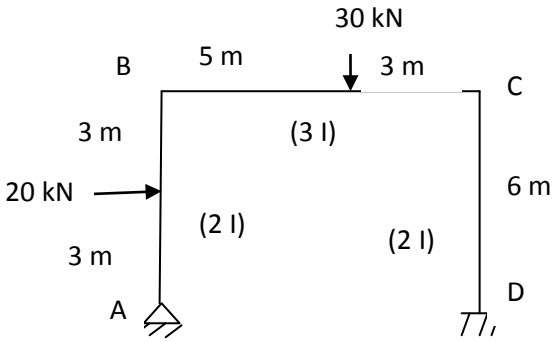
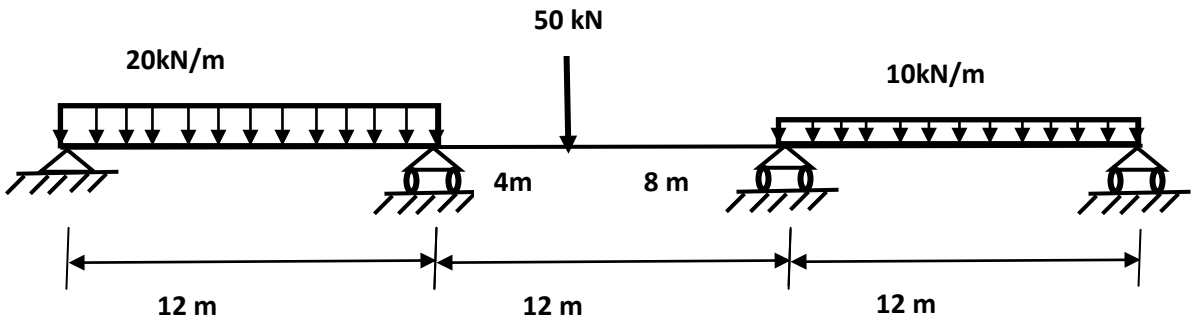


UNIT – IV

8 Analyse the beam shown in fig below using Flexibility matrix method. Take EI constant throughout.



OR

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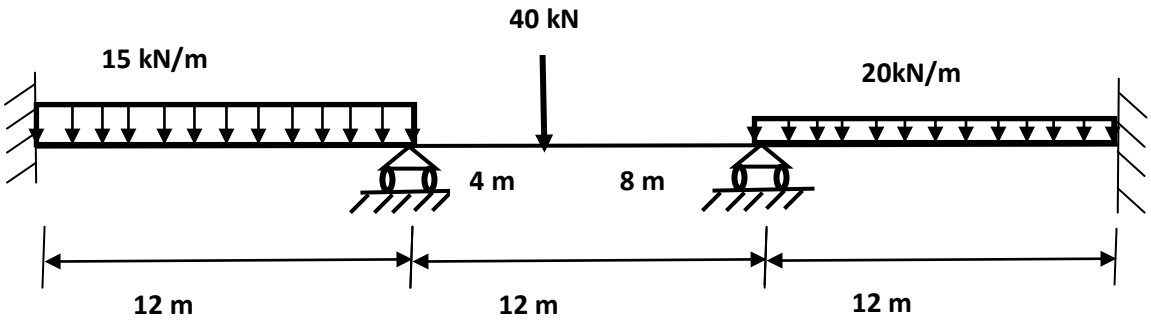
9 Analyse the beam shown in fig below using Stiffness matrix method. Take EI constant throughout.

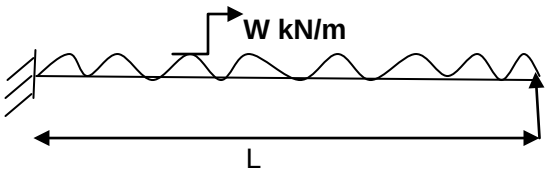


UNIT – V

10 A fixed beam of span 8m carries a udl load w on the left half portion. If the fully plastic moment of the beam is 150 kN-m. Find the value of the collapse load.

OR

11 A propped cantilever of span L is subjected to uniformly distributed load w per unit length. Determine the collapse load, if the plastic moment capacity of the beam is Mp.



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