Code: 13A01505

R13

B.Tech III Year I Semester (R13) Regular & Supplementary Examinations November/December 2016

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) What is meant by Eddy' theorem
(b) Explain the effect of temperature on the arch
(c) What are the reasons for side sway in the frames
(d) Define stiffness and carry over factor
(e) What are the salient points in the Kani's method of analysis
(f) Briefly explain the basic concept of Kani's method analysis
(g) Differentiate local and global coordinates? Illustrate with an example.
(h) Define flexibility and stiffness coefficients.
(i) Define shape factor and plastic hinge
(j) What is meant upper and lower bound theorem

PART – B

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

UNIT – I

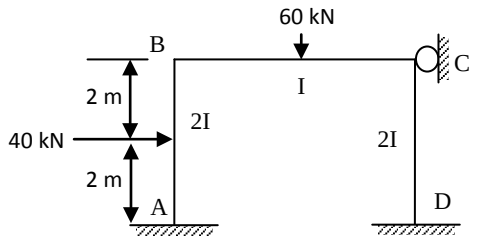
2 A symmetrical three hinged parabolic arch of span 40 m and rise 8m carries an uniformly distributed load of 30 kN/m over left half of the span. The hinges are provided at the supports and centre of the span. Calculate the reactions at the support. Also calculate the bending moment, shear force and normal thrust a distance of 10 m from the left support.

OR

3 A three hinged circular arch of span 16 m and rise 4 m is subjected to two loads of 100 kN and 80 kN at the left and right quarter span points respectively. Find the bending moment and shear force and normal thrust at 6 m from the left support.

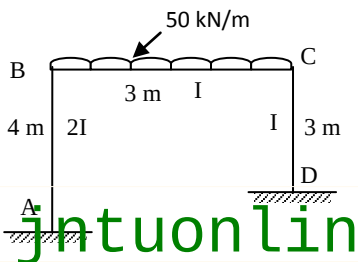
UNIT – II

4 Analyze the portal frame shown in figure below, by slope deflection method. The relative moment of inertia value for each member is indicated in the figure below. Sketch the bending moment diagram.



OR

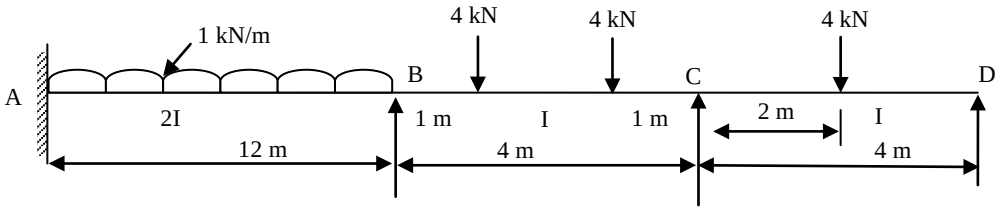
5 Analyze the portal frame shown in figure below by moment distribution method. The relative moment of inertia value for each member is indicated in the figure below. Sketch the bending moment diagram.



Contd. in page 2

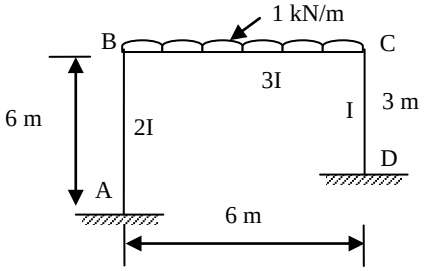
UNIT – III

6 Analyze the continuous beam shown in figure below by Kani's method.



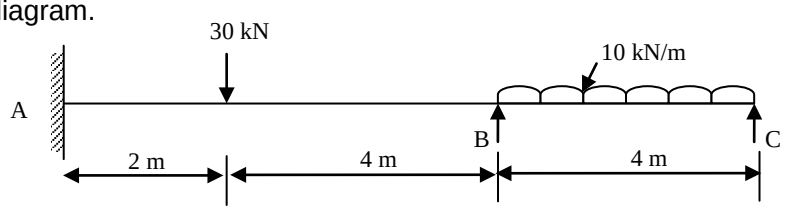
OR

7 Analyze the frame shown in figure below by Kani's method.



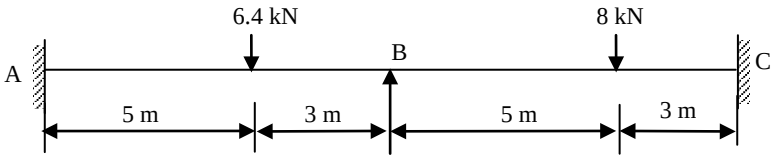
UNIT – IV

8 Analyze the continuous beam shown in figure below by matrix flexibility method and draw the bending moment diagram.



OR

9 Analyze the continuous beam shown below by matrix stiffness method and draw the bending moment diagram.



UNIT – V

10 A beam fixed at both the ends is subjected to uniformly distributed load 'W' on the right half portion. Determine the value of collapse load W_C. The beam is of uniform plastic moment M_P.

OR

11 A two span continuous beam ABC has span lengths AB = 6 m and BC = 6 m and carries a u.d.l. of 30 kN/m completely covering the spans AB and BC. A and C are simple supports. If the load factor is 1.80 and the shape factor is 1.15 for the 'I' section, find the section modulus needed. Assume yield stress for the material as 250 MPa.

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