

B.Tech III Year I Semester (R13) Supplementary Examinations June 2017

STRUCTURAL ANALYSIS - II

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

PART - A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- State Eddy's theorem.
 - What do you mean by normal thrust and radial shear in arches?
 - Differentiate single bay and single storey portal frames.
 - State the reasons for side sway in portal frames.
 - What is rotation factor in Kani's method?
 - Write the advantages of Kani's method.
 - Explain the relation between flexibility and stiffness matrices.
 - Write the flexibility and stiffness coefficients for flexural displacement.
 - State plastic hinge and plastic moment capacity.
 - Draw the stress diagrams at various loading stages for a typical beam subjected to gradually increasing load.

PART - B

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

UNIT - I

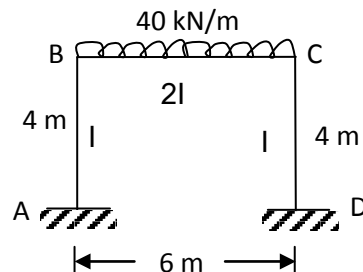
- 2 A 3-hinged circular arch has a span of 40 m and a central rise of 8 m. It carries a u.d.l of 20 kN/m over the left-half of the span together with a concentrated load of 100 kN at the right quarter span point. Find the reactions at the supports, normal thrust and shear at a section 10 m from left support.

OR

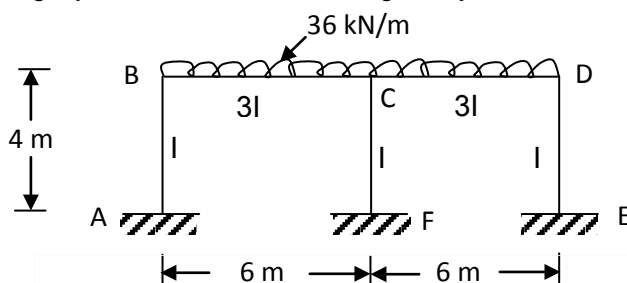
- 3 A 3-hinged parabolic arch of 20 m span and 4 m central rise carries a point load of 4 kN at 4 m horizontally from the left hand hinge. Calculate the normal thrust and shear force at the section under the load. Also, calculate the maximum B.M positive and negative. Draw BMD.

UNIT - II

- 4 Analyze the frame shown in figure by slope deflection method and draw BMD.

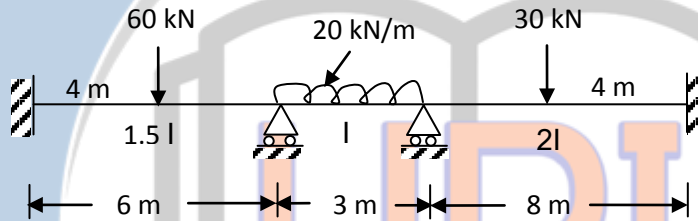
**OR**

- 5 Analyze the rigid jointed frame shown in figure by moment distribution method and draw BMD.



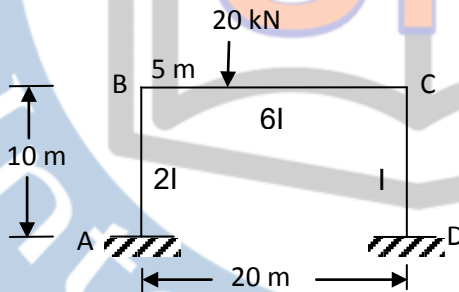
UNIT - III

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



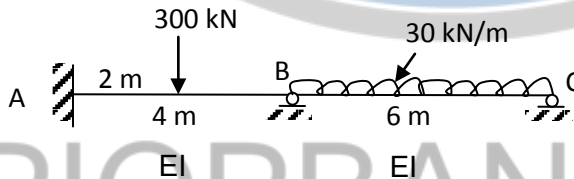
OR

- 7 Analyze the portal frame shown in figure by using Kani's method.



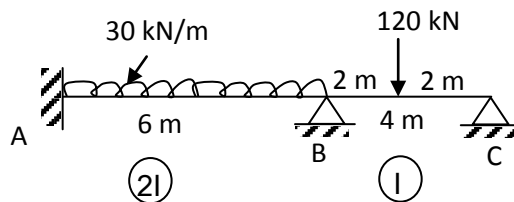
UNIT - IV

- 8 Analyze the continuous beam shown in figure by the flexibility method. Draw the shearforce and bending moment diagram.



OR

- 9 Analyze the continuous beam shown in figure by Stiffness method. The support B sinks by 5 mm. Draw BMD.



UNIT - V

- 10 Explain in detail the various stages of bending of rectangular sections. Draw sketches.

OR

- 11 Explain:

- Lower bound theorem.
- Upper bound theorem.