R20 Regulation *Subject code: 3P5AB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech V Semester Supplementary Examinations, June/July 2023

STRUCTURAL ANALYSIS-II

(Civil Engineering)

Maximum Marks: 70 Date:26.06.2023 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 Write the types of arches based on the number of hinges.
2 Define the term Carryover factor.
3 Write the sign convention of fixed end moments, rotation and deflection in slope deflection method.
4 What is sway correction factor?
5 Define the term rotation factor as used in Kani's method.
6 What are advantages in Kani's method?
7 What is the relation between flexibility and stiffness matrix?
8 List the properties of the stiffness matrix.
9 Write the basic assumptions of analysis in Factor method when lateral loads applied on the structure.
10 Define influence line diagram in simple manner.

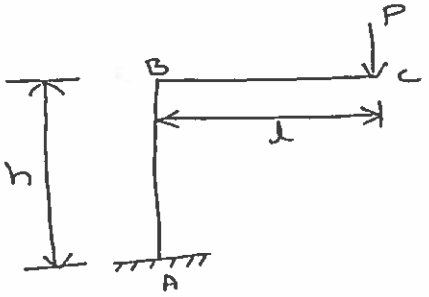
Part-B

Answer All the following questions. (5X10M=50Marks)

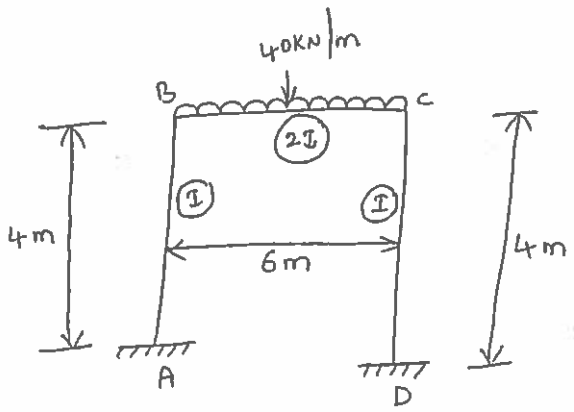
11 A two hinged parabolic arch of span 36 m and central rise 8 m carries a uniformly distributed load of 32 KN/m over the left half of the span. Determine the position and value of maximum bending moment. Also find the normal thrust and radial shear at the section. Assume that the moment of inertia at a section varies as secant of the slope at the section. 10M

OR

12 A. Derive the castigliano's second theorem. 5M
B. Find the deflection at 'C' by using of castigliano's theorem. 5M

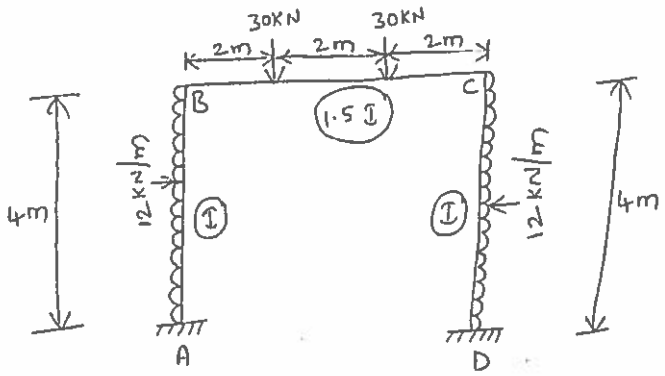


13 Analyse the frame ABCD shown figure by using of slope deflection method. (BC span is 40KN/m). Draw BMD. 10M

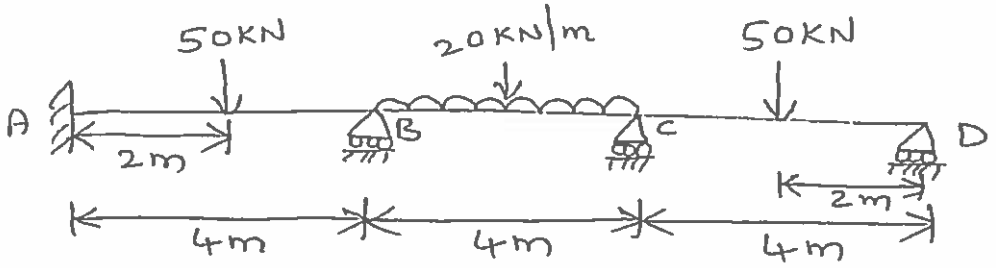


OR

14 Analyse the symmetric Portal frame shown in fig by moment distribution method. 10M

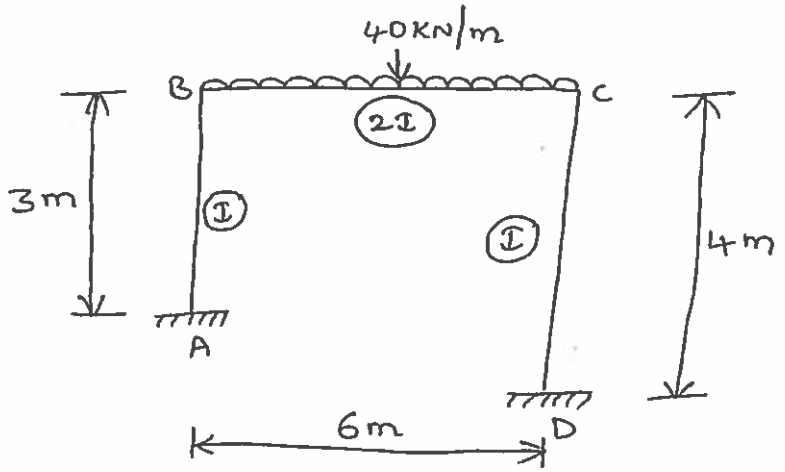


15 Analyse the continuous beam shown in figure by Kani's method and draw shear force and bending moment diagrams. Draw the elastic curve also. 10M

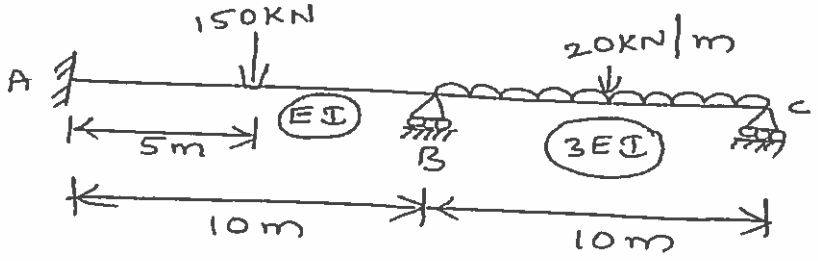


OR

16 Analyze the Portal frame shown in fig by Kani's method. 10M

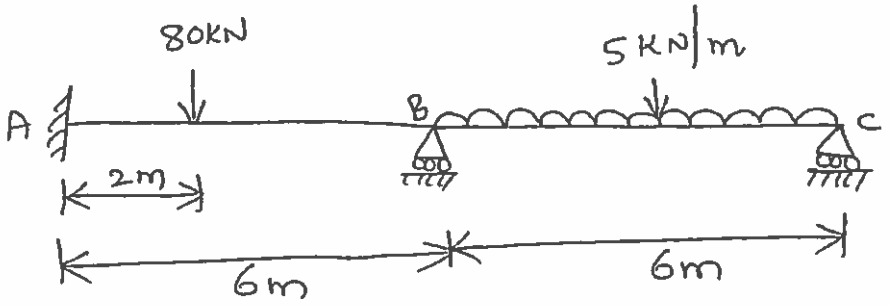


17 Analyze continuous beam shown in figure using the Flexibility method. Draw BMD. Given AB=BC=10m. 10M

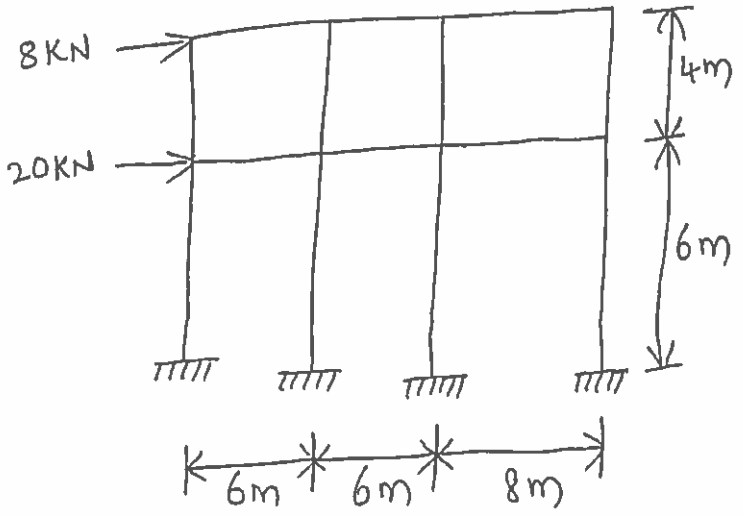


OR

18 Analyze the continuous beam shown in fig. by Stiffness method. Assume down ward settlement at B and C is 10mm and 5mm respectively. And uniform flexural rigidity of beam AB and BC= EI=$18x10^{11}$ N-mm^2. 10M



19 Analyze the two storey rigid moment resisting frame shown in fig. by Cantilever method. Draw the BMD and SFD. Assume uniform flexural rigidity of beams and columns. 10M



OR

20 Draw the influence diagram for bending moment at section D at midpoint of span AB of continuous beam ABC. Span AB=4m and BC=6m. Find ordinates at midpoint of span AB and BC. 10M