

Total No. of Questions: 09

B.Tech.(CE) (2011 Onwards) (Sem. – 5)

STRUCTURAL ANALYSIS – II

M Code: 70514

Subject Code: BTCE-503

Paper ID: [A2080]

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION A

1. a) Differentiate between kinematic and static indeterminacy with example.
b) Write down the expression of strain energy due to bending moment.
c) What is the difference between sway and non-sway frame?
d) Differentiate between rigid and pin jointed structures.
e) What are the fixed end moments for beam having span 7m and subjected to concentrated load 40KN at a distance 3m from support A?
f) Why slope deflection method is called a 'displacement method'?
g) State the Muller - Breslau with regards to influence line diagram.
h) What is the difference between absolute stiffness and relative stiffness?
i) Define carry over moment and carry over factor.
j) Write down the displacement contribution equation for rigid frame.

SECTION B

2. Find the reaction in the beam (shown in fig 1) using consistent deformation method.

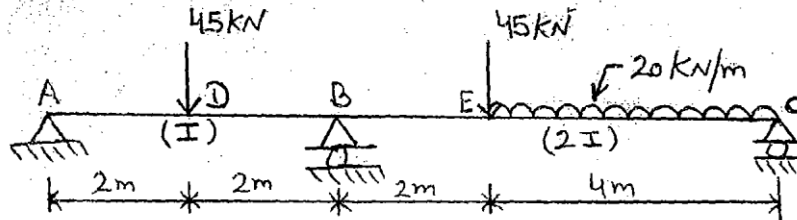


Fig.1

3. Analyse the continuous beam ABCD Shown in figure 2 by slope deflection method and draw bending moment diagram.

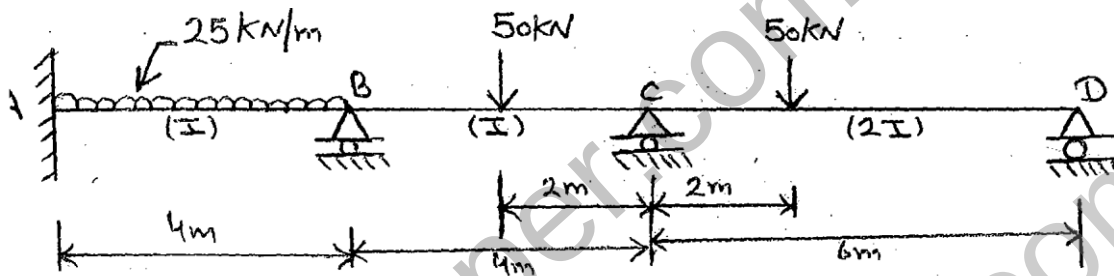


Fig.2

4. Analysis the continuous beam shown in figure 3 by moment distribution method.

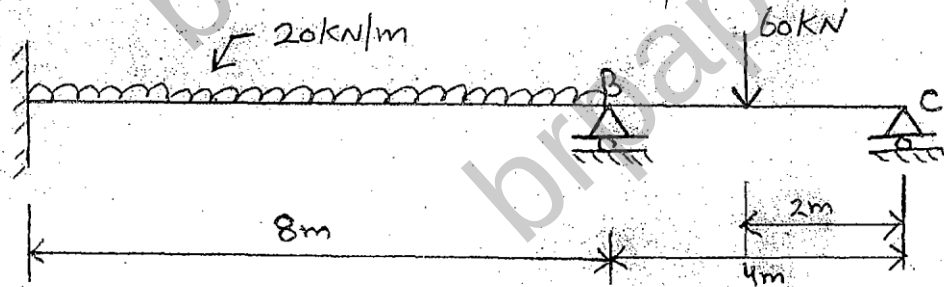


Fig.3

5. Using Kani's rotational contribution method, analyse the frame shown in figure 4. Moment of inertia of the members are shown encircled near the members.

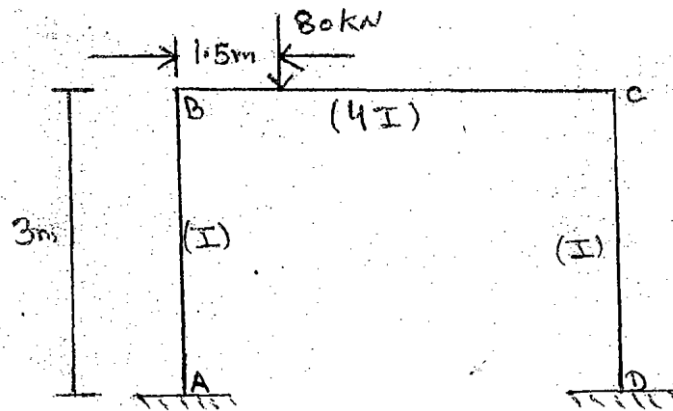


Fig.4

6. A two- hinged parabolic arch is loaded as shown in figure 5 Determine the a) Horizontal thrust b) Maximum positive and negative moments c) shear force and normal thrust at 10 m from the left support.

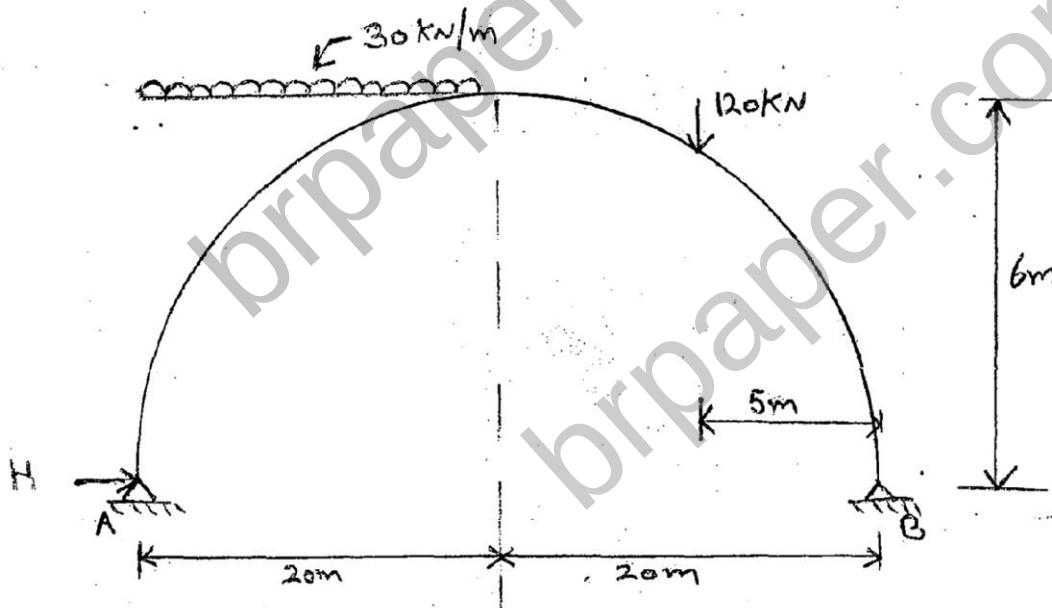


Fig.5

SECTION C

7. Find the influence line diagram for reaction at B in the continuous beam shown in figure 6

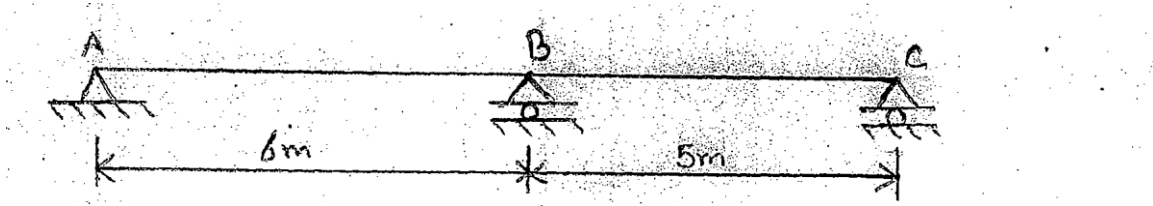


Fig.6

8. Analyse the portal frame shown in fig 7.

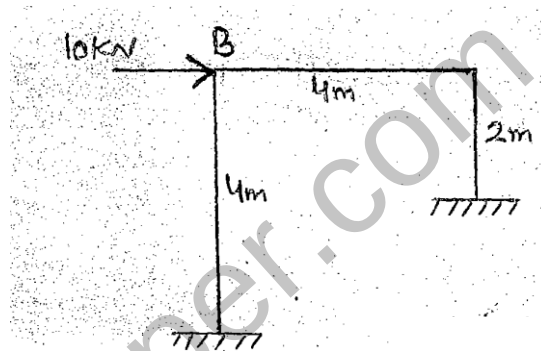


Fig.7

9. Analyse the frame shown in figure 8 by cantilever method. Area of each exterior column is one half of the area of the interior columns.

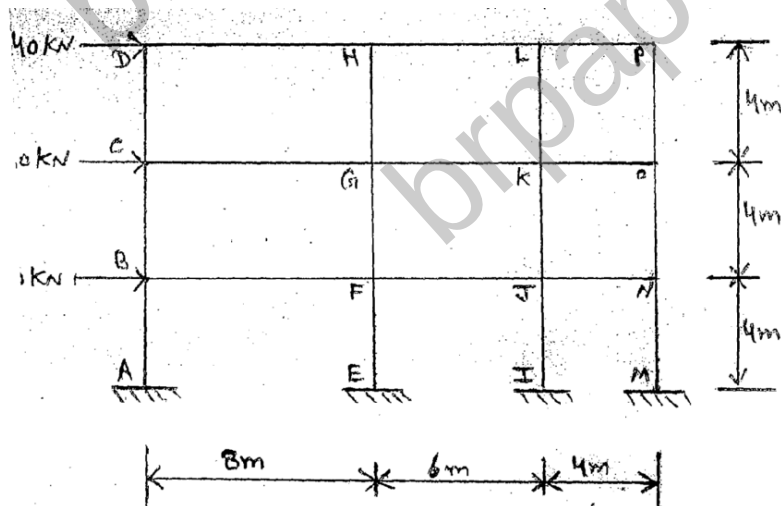


Fig.8