

Roll No

CE-601**B.E. VI Semester**

Examination, December 2016

Theory of Structures-II*Time : Three Hours**Maximum Marks : 70*

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 ii) All parts of each question are to be attempted at one place.
 iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
 iv) Except Numericals, Derivation, Design and Drawing etc.
 v) Any missing data may be suitably assumed, if any.

Unit-I

1. a) What are the different indeterminacies in the structure? Explain their uses in the structural analysis giving the examples.
- b) State the advantages of Kani's method over the other displacement methods.
- c) What is distribution factor? Derive necessary expressions for the same.
- d) Analyze the portal frame using by moment distribution method. Draw BMD. (Figure 1)

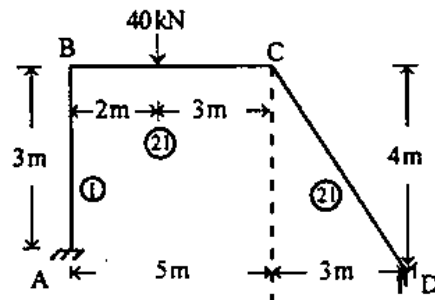


Figure 1

[2]

OR

Analyze the beam using by Kani's method. Draw BMD. (Figure 2)

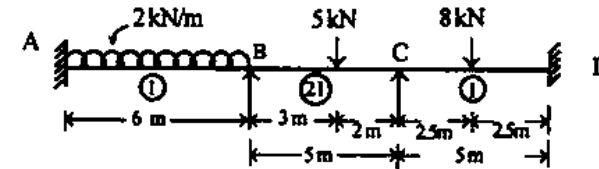


Figure 2

Unit-II

2. a) Explain how the assumptions in plastic analysis are different from the elastic analysis of structures.
- b) Write the basic fundamental conditions for plastic theory.
- c) Show that the fully-plastic moment of a beam of rectangular cross-section is 50% greater than the bending moment at which the beam reaches the limit of elasticity.
- d) Determine the value of W at collapse for the portal frame. (Figure 3).

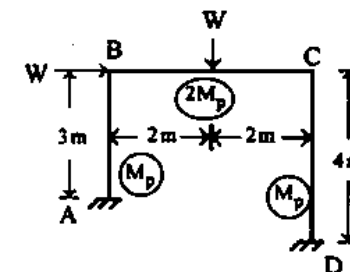


Figure 3

OR

Calculate the plastic moment capacity for portal frame shown in (Figure 4).

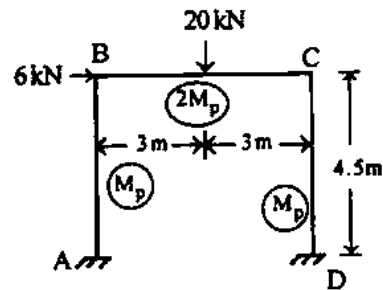


Figure 4

Unit-III

3. a) Why are the approximate analysis of the structures is required? Explain clearly.
- b) What is the main difference in portal method and cantilever method?
- c) Draw diagram to show two types of substitute frames.
- d) Analyze the building frame subjected to horizontal forces using by portal method. Sketch BMD. (Figure 5).

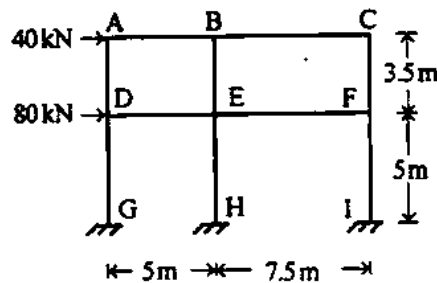


Figure 5

[4]

OR

Analyze the building frame subjected to horizontal forces using by cantilever method. (Figure 6).

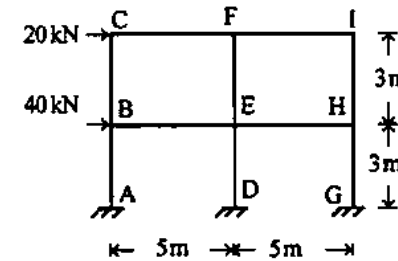


Figure 6

Unit-IV

4. a) State the advantages of matrix methods of structural analysis over the conventional methods.
- b) To what type of structure, flexibility method of analysis is applicable?
- c) Write the matrix form of the load-displacement equation for a truss member.
- d) Analyze the continuous beam by using matrix flexibility method. Draw BMD. (Figure 7).

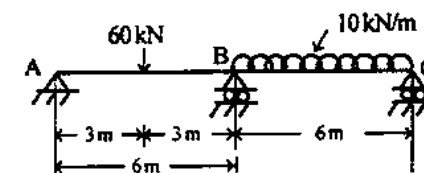


Figure 7

OR

Analyze the continuous beam by using matrix stiffness method (Displacement Method). The moments of inertia is constant throughout. Draw BMD. (Figure 8).

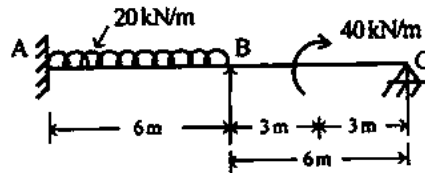


Figure 8

Unit-V

5. a) What for the influence lines are required to be plotted for structures? How the influence line for an indeterminate structure is different from that of determinate structure?
- b) State the Muller-Breslau principle and where is it used?
- c) Differentiate between the bending moment diagram and the influence line diagram for a beam.
- d) Draw the influence line for the shear at the internal hinge E in the beam. Use it to draw the influence line for V_D . Draw influence line ordinates at every 3m interval. (Figure 9).

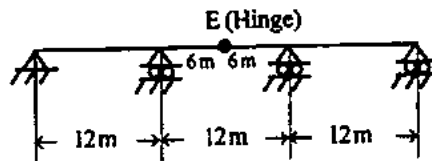


Figure 9

OR

- i) What is a beam column? How does the structural behavior of a beam column differ from a column?
- ii) Write the governing differential equation for an axial loaded beam column. How can it be solved in terms of constants of integration?
