1. In slope deflection method, what does the slope deflection equation represent?

a) Moment at a support
b) Rotation at a support
c) Flexural rigidity of the beam
d) Axial force in the beam

Answer: b) Rotation at a support

Explanation: In slope deflection method, the slope deflection equation represents the rotation at a support due to the applied loads and member stiffness.

2. Which method is based on the principle of virtual work in structural analysis?

a) Slope deflection method
b) Column analogy method
c) Moment distribution method
d) Force method

Answer: d) Force method

Explanation: Force method, also known as the flexibility method, is based on the principle of virtual work, where the virtual displacements are used to calculate the forces in the structure.

3. In slope deflection method, which of the following is assumed constant along the length of the beam?

a) Shear force
b) Bending moment
c) Rotation
d) Deflection

Answer: c) Rotation

Explanation: In slope deflection method, it is assumed that the rotation remains constant along the length of the beam between any two adjacent joints.

4. What is the primary advantage of using the column analogy method in structural analysis?

a) It provides exact solutions for indeterminate structures
b) It simplifies complex structures into determinate ones
c) It directly calculates support reactions
d) It considers material nonlinearity

Answer: b) It simplifies complex structures into determinate ones

Explanation: The column analogy method simplifies complex structures by transforming them into equivalent determinate frame structures, making analysis easier.

5. Which method is particularly suitable for analyzing sway frames and tall structures?

a) Slope deflection method
b) Moment distribution method
c) Column analogy method
d) Finite element method

Answer: c) Column analogy method

Explanation: Column analogy method is particularly suitable for analyzing sway frames and tall structures, where the frame elements are considered as interconnected columns.

6. In slope deflection method, which condition indicates that a joint is fixed against rotation?

a) Δ = 0
b) Δ’ = 0
c) M = 0
d) V = 0

Answer: b) Δ’ = 0

Explanation: In slope deflection method, the condition Δ’ = 0 indicates that a joint is fixed against rotation, where Δ’ represents the slope of the member at the joint.

7. What is the basic assumption made in the column analogy method?

a) Members carry axial loads only
b) Members are infinitely rigid
c) Members behave like columns under axial loads
d) Members undergo linear deformation

Answer: c) Members behave like columns under axial loads

Explanation: The basic assumption in the column analogy method is that the members of the frame behave like columns under axial loads, allowing the application of column analysis

principles.

8. Which method is commonly used to analyze continuous beams with multiple spans?

a) Slope deflection method
b) Moment distribution method
c) Column analogy method
d) Portal method

Answer: b) Moment distribution method

Explanation: Moment distribution method is commonly used to analyze continuous beams with multiple spans due to its simplicity and effectiveness in handling such structures.

9. What does the stiffness factor in slope deflection method represent?

a) Material properties of the beam
b) Geometric properties of the beam
c) Member stiffness relative to support conditions
d) External loads applied to the beam

Answer: c) Member stiffness relative to support conditions

Explanation: The stiffness factor in slope deflection method represents the relative stiffness of the member with respect to its support conditions, influencing the distribution of moments and rotations.

10. Which method is preferred for analyzing statically indeterminate structures with non-

prismatic members?

a) Slope deflection method
b) Moment distribution method
c) Column analogy method
d) Matrix displacement method

Answer: d) Matrix displacement method

Explanation: Matrix displacement method, also known as the direct stiffness method or finite element method, is preferred for analyzing statically indeterminate structures with non-prismatic members due to its versatility and accuracy.

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