

1. What type of indeterminacy occurs when a structure has more unknown reactions than equilibrium equations?

- a) Static indeterminacy
- b) Kinematic indeterminacy
- c) Structural indeterminacy
- d) Material indeterminacy

Answer: a) Static indeterminacy

Explanation: Static indeterminacy refers to the situation where the number of unknown reactions exceeds the number of equilibrium equations available for solving the structure.

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2. The theorem of three moments is used for the analysis of which type of structures?

- a) Trusses
- b) Frames
- c) Arches
- d) Cables

Answer: b) Frames

Explanation: The theorem of three moments is commonly applied in the analysis of frames to determine the bending moments at various sections.

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3. What effect does sinking and rotation of supports have on a beam structure?

- a) Increases static determinacy
- b) Decreases bending moment
- c) Reduces shear force
- d) Introduces additional moments

Answer: d) Introduces additional moments

Explanation: Sinking and rotation of supports can introduce additional moments into the beam structure, affecting its overall behavior.

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4. Which method is used for analyzing fixed and continuous beams by distributing moments iteratively?

- a) Slope-deflection method
- b) Moment distribution method
- c) Force method
- d) Flexibility method

Answer: b) Moment distribution method

Explanation: The moment distribution method is employed to analyze fixed and continuous beams by iteratively distributing moments until equilibrium is achieved.

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5. In the moment distribution method, what is typically assumed about the sway of the structure?

- a) Fully restrained
- b) No sway
- c) Partially restrained
- d) Unstable

Answer: b) No sway

Explanation: The moment distribution method assumes no sway in the structure, simplifying the analysis by neglecting lateral displacements.

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6. How does kinematic indeterminacy differ from static indeterminacy in structures?

- a) Kinematic indeterminacy involves excessive displacements.
- b) Static indeterminacy arises from a lack of equilibrium equations.
- c) Kinematic indeterminacy relates to constraints on deformations.
- d) Static indeterminacy requires additional supports.

Answer: c) Kinematic indeterminacy relates to constraints on deformations.

Explanation: Kinematic indeterminacy refers to the redundancy of deformation constraints in a structure, unlike static indeterminacy, which relates to the equilibrium equations.

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7. Which theorem is used to determine the bending moments at various sections of a frame without solving simultaneous equations?

- a) Castigliano's theorem
- b) Clapeyron's theorem
- c) Theorem of three moments
- d) Betti's theorem

Answer: c) Theorem of three moments

Explanation: The theorem of three moments facilitates the determination of bending moments in frames without requiring the solution of simultaneous equations.

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8. What happens to the stability of a structure if sinking supports are not considered in the analysis?

- a) Stability is increased
- b) Stability is unaffected
- c) Stability is decreased
- d) Stability becomes indeterminate

Answer: c) Stability is decreased

Explanation: Neglecting sinking supports in the analysis can lead to an underestimation of

moments and decrease the stability of the structure.

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9. Which method of structural analysis accounts for the redistribution of moments through iterative calculations?

- a) Flexibility method
- b) Moment distribution method
- c) Matrix method
- d) Displacement method

Answer: b) Moment distribution method

Explanation: The moment distribution method involves iterative calculations to distribute moments throughout a structure until equilibrium is reached.

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10. What characteristic distinguishes the moment distribution method from other structural analysis techniques?

- a) Incorporates sway effects
- b) Solves for displacements
- c) Accounts for material properties
- d) Utilizes iterative moment redistribution

Answer: d) Utilizes iterative moment redistribution

Explanation: The moment distribution method uniquely employs iterative redistribution of moments to analyze structures, distinguishing it from other techniques.