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.