1. Which structural configuration is commonly employed for earthquake-resistant design?

a) Plan irregularities
b) Vertical irregularities
c) Aseismic configuration
d) Symmetrical configuration

Answer: c) Aseismic configuration

Explanation: Aseismic configuration refers to the structural design that incorporates features to resist seismic forces effectively, such as proper distribution of mass and stiffness throughout the structure.

2. What is the primary concern addressed by designing for plan irregularities in earthquake-resistant structures?

a) Lateral stiffness
b) Torsional resistance
c) Vertical load distribution
d) Structural stability

Answer: b) Torsional resistance

Explanation: Plan irregularities can induce torsional forces during earthquakes, which must be accounted for in structural design to ensure the building can withstand such forces.

3. Which structural feature is susceptible to soft storey failure during earthquakes?

a) Foundation
b) Roof
c) Intermediate floors
d) Ground floor

Answer: d) Ground floor

Explanation: Soft storey refers to a level of a building with significantly less stiffness or strength compared to the levels above, making it prone to collapse or severe damage during seismic events.

4. In IS-1893, what aspect is covered by design provisions for torsion in buildings?

a) Lateral stability
b) Vertical load distribution
c) Torsional rigidity
d) Torsional strength

Answer: d) Torsional strength

Explanation: IS-1893 provides guidelines for ensuring adequate torsional strength in buildings to resist torsional forces induced by earthquakes.

5. What effect do infill masonry walls have on the behavior of framed structures during earthquakes?

a) Decrease in stiffness
b) Increase in ductility

c) Reduction in lateral drift
d) Enhancement of lateral stability

Answer: a) Decrease in stiffness

Explanation: Infill masonry walls can reduce the overall stiffness of framed structures, affecting their response to seismic forces.

6. Which concept is crucial for modeling infill masonry walls in structural analysis?

a) Racking resistance
b) Diaphragm action
c) Shear lag
d) Bond strength

Answer: b) Diaphragm action

Explanation: Diaphragm action refers to the horizontal distribution of lateral loads within a structure, including those transferred through infill masonry walls, and is important for accurate structural modeling.

7. What is a common failure pattern observed in masonry buildings during earthquakes?

a) Shear failure
b) Flexural failure
c) Out-of-plane failure
d) Compression failure

Answer: c) Out-of-plane failure

Explanation: Out-of-plane failure occurs when masonry walls collapse or detach from the main structure due to lateral forces exerted during earthquakes.

8. What parameter significantly influences the strength of masonry in shear and flexure?

a) Mortar composition
b) Wall thickness
c) Aspect ratio
d) Material density

Answer: a) Mortar composition

Explanation: The composition of mortar used in masonry construction plays a significant role in determining the strength of the structure in both shear and flexure.

9. What concept is relevant in assessing the slenderness of masonry walls?

a) Aspect ratio
b) Modulus of elasticity
c) Shear modulus
d) Poisson's ratio

Answer: a) Aspect ratio

Explanation: The aspect ratio, defined as the ratio of the height to the thickness of a masonry wall, is crucial in determining its slenderness and consequently its behavior under lateral loads, including seismic forces.

10. In seismic design, what is the significance of considering the slenderness of masonry walls?

a) To minimize material usage
b) To ensure stability against wind loads
c) To prevent out-of-plane failures
d) To enhance architectural aesthetics

Answer: c) To prevent out-of-plane failures

Explanation: Considering the slenderness of masonry walls in seismic design helps prevent out-of-plane failures, ensuring the structural integrity and safety of the building during earthquakes.

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