1. What is the primary objective of seismic design philosophy in building structures?

a) To eliminate any possibility of damage during an earthquake
b) To minimize the cost of construction
c) To ensure the safety of occupants by reducing structural damage
d) To maximize the architectural aesthetics

Answer: c) To ensure the safety of occupants by reducing structural damage
Explanation: Seismic design philosophy aims to prioritize the safety of occupants by reducing structural damage during earthquakes, rather than eliminating it completely.

2. Which of the following is NOT a primary consideration in load combinations for earthquake-resistant design?

a) Dead loads
b) Live loads
c) Wind loads
d) Snow loads

Answer: d) Snow loads
Explanation: Snow loads are not typically considered in load combinations for earthquake-resistant design, as they are relevant only in areas prone to heavy snowfall.

3. What is the purpose of ductility in building structures concerning earthquake resistance?

a) To increase the weight of the structure
b) To decrease the flexibility of the structure
c) To allow for redistribution of forces during seismic events

d) To enhance the visual appeal of the building

Answer: c) To allow for redistribution of forces during seismic events
Explanation: Ductility in building structures enables them to undergo significant deformation without sudden failure, thus allowing for the redistribution of seismic forces and reducing the likelihood of collapse.

4. Which method is commonly employed for the confinement of concrete to enhance ductility in building columns?

a) Adding more dead load
b) Increasing the thickness of the columns
c) Using steel ties or hoops
d) Applying additional paint layers

Answer: c) Using steel ties or hoops
Explanation: Steel ties or hoops are commonly used to confine concrete in building columns, enhancing their ductility and seismic performance by preventing premature failure.

5. How are columns and beams designed for ductility in earthquake-resistant structures?

a) By increasing their rigidity
b) By reducing their strength
c) By maximizing their flexibility
d) By ensuring adequate reinforcement and detailing

Answer: d) By ensuring adequate reinforcement and detailing
Explanation: Columns and beams in earthquake-resistant structures are designed for ductility

by ensuring they have adequate reinforcement and detailing, allowing them to deform safely under seismic loads.

6. According to IS-1893, what are ductile detailing provisions primarily concerned with?

a) Increasing construction speed
b) Enhancing architectural features
c) Improving seismic performance
d) Reducing material costs

Answer: c) Improving seismic performance
Explanation: Ductile detailing provisions in IS-1893 primarily focus on improving the seismic performance of building structures by ensuring adequate reinforcement and detailing to enhance ductility.

7. Which type of lateral load-resisting structural system is commonly used in high-rise buildings for earthquake resistance?

a) Braced frames
b) Timber frames
c) Masonry walls
d) Unreinforced concrete walls

Answer: a) Braced frames
Explanation: Braced frames are commonly used in high-rise buildings for earthquake resistance due to their ability to dissipate seismic energy and provide lateral stability.

8. In earthquake-resistant design, what is the purpose of energy absorption in buildings?

a) To increase construction costs
b) To minimize architectural features
c) To prevent deformation
d) To dissipate seismic forces

Answer: d) To dissipate seismic forces
Explanation: Energy absorption in buildings is essential in earthquake-resistant design to dissipate seismic forces and prevent excessive deformation or damage to the structure.

9. Which of the following is NOT a factor considered in the design of structures for earthquake resistance?

a) Material strength
b) Building height
c) Soil type
d) Wind direction

Answer: d) Wind direction
Explanation: Wind direction is not a factor considered in the design of structures for earthquake resistance. Factors such as material strength, building height, and soil type are crucial considerations.

10. What role does ductility play in the behavior of building structures during seismic events?

a) It increases brittleness
b) It promotes sudden failure
c) It allows for controlled deformation
d) It reduces the need for reinforcement

Answer: c) It allows for controlled deformation
Explanation: Ductility enables building structures to undergo controlled deformation during seismic events, reducing the likelihood of sudden failure and improving overall seismic performance.

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