- 1. What is the primary objective of seismic control systems in structures?
- a) To prevent earthquakes from occurring
- b) To minimize the effects of earthquakes on structures
- c) To increase the intensity of earthquakes
- d) To enhance the aesthetic appeal of structures

Answer: b) To minimize the effects of earthquakes on structures

Explanation: Seismic control systems aim to reduce the damage caused by earthquakes on structures by mitigating the forces transmitted to the building during seismic events.

- 2. Which of the following is NOT a type of seismic control system?
- a) Active
- b) Reactive
- c) Passive
- d) Semi-active

Answer: b) Reactive

Explanation: Reactive systems are not a recognized type of seismic control system. The primary types are active, passive, and semi-active.

- 3. What characterizes passive seismic control systems?
- a) They require external power to function
- b) They adjust stiffness and damping properties in real-time
- c) They do not require external power to function
- d) They are always more expensive than active systems

Answer: c) They do not require external power to function

Explanation: Passive seismic control systems operate without the need for external power sources and typically consist of devices like dampers or base isolators.

- 4. Which seismic control system allows for real-time adjustment of stiffness and damping properties?
- a) Active
- b) Passive
- c) Semi-active
- d) Hybrid

Answer: a) Active

Explanation: Active seismic control systems use sensors and actuators to adjust stiffness and damping properties in real-time, actively responding to seismic forces.

- 5. What is a key advantage of semi-active seismic control systems over passive systems?
- a) Higher initial cost
- b) Lower maintenance requirements
- c) Greater adaptability to varying seismic conditions
- d) Inability to retrofit existing structures

Answer: c) Greater adaptability to varying seismic conditions

Explanation: Semi-active systems offer the advantage of adaptability, allowing for adjustments in damping properties according to changing seismic conditions.

- 6. What is the purpose of base isolation systems in seismic control?
- a) To increase the weight of the structure
- b) To decrease the flexibility of the structure

- c) To disconnect the structure from the ground motion
- d) To amplify seismic waves

Answer: c) To disconnect the structure from the ground motion

Explanation: Base isolation systems are designed to decouple the structure from the ground motion during earthquakes, reducing the transmission of seismic forces to the building.

- 7. Which type of seismic control system is most suitable for retrofitting existing structures?
- a) Active
- b) Passive
- c) Semi-active
- d) Hybrid

Answer: b) Passive

Explanation: Passive seismic control systems are often preferred for retrofitting existing structures due to their simplicity and lower maintenance requirements compared to active or semi-active systems.

- 8. What is the primary function of damping devices in seismic control systems?
- a) To increase seismic forces on the structure
- b) To decrease seismic forces on the structure
- c) To strengthen the foundation of the structure
- d) To control the temperature inside the structure

Answer: b) To decrease seismic forces on the structure

Explanation: Damping devices in seismic control systems are intended to dissipate energy and reduce the amplitude of vibrations induced by seismic events, thereby decreasing the seismic forces on the structure.

- 9. What is a requirement for an efficient earthquake-resistant structural system?
- a) High susceptibility to seismic forces
- b) Low stiffness and flexibility
- c) Adequate strength and ductility
- d) Minimal maintenance needs

Answer: c) Adequate strength and ductility

Explanation: An efficient earthquake-resistant structural system requires sufficient strength to withstand seismic forces and ductility to deform without collapsing, thereby dissipating seismic energy.

- 10. What is the primary objective of retrofitting structures for seismic control?
- a) To increase the visual appeal of the structure
- b) To decrease the initial construction cost
- c) To enhance the structural integrity and safety during earthquakes
- d) To reduce the overall weight of the structure

Answer: c) To enhance the structural integrity and safety during earthquakes Explanation: Retrofitting structures for seismic control aims to improve their ability to withstand earthquakes, enhancing structural integrity and safety during seismic events.

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