1. What does “two degrees of freedom” refer to in a vibrating system?

a) The system’s ability to move in two different directions simultaneously
b) The presence of two different natural frequencies in the system
c) The number of components involved in the vibration
d) The degrees of rotation and translation allowed in the system

Answer: d) The degrees of rotation and translation allowed in the system

Explanation: “Two degrees of freedom” in a vibrating system mean that the system can move independently in two different directions or modes of motion.

2. Which of the following describes the un-damped free vibration of a system with two degrees of freedom?

a) Vibration without any external force or damping
b) Vibration with damping but no external force
c) Vibration with external force but no damping
d) Vibration with both external force and damping

Answer: a) Vibration without any external force or damping

Explanation: In un-damped free vibration, there are no external forces acting on the system, and there is no damping present, allowing the system to vibrate freely.

3. What are principal modes of vibration in a two-degree-of-freedom system?

a) The dominant frequencies of vibration

b) The most common types of vibration patterns
c) The natural modes of vibration of the system
d) The modes of vibration induced by external forces

Answer: c) The natural modes of vibration of the system

Explanation: Principal modes of vibration represent the natural modes of vibration of the system, which occur without any external forces acting on it.

4. Torsion vibrations primarily involve:

a) Linear motion
b) Rotational motion
c) Translational motion
d) Oscillatory motion

Answer: b) Rotational motion

Explanation: Torsion vibrations predominantly involve rotational motion around an axis, rather than linear or translational motion.

5. What happens in forced, un-damped vibrations with harmonic excitation?

a) The system vibrates freely without any external force
b) External forces drive the system at its natural frequency
c) Damping reduces the amplitude of vibrations
d) Natural frequencies of the system are altered

Answer: b) External forces drive the system at its natural frequency

Explanation: In forced, un-damped vibrations with harmonic excitation, external forces act on the system at its natural frequency, causing it to vibrate in resonance.

6. Coordinate coupling in vibration systems refers to:

a) The interaction between different components of the system
b) The conversion of motion between translation and rotation
c) The synchronization of vibration frequencies
d) The damping effect on the system

Answer: a) The interaction between different components of the system

Explanation: Coordinate coupling involves the interaction between different degrees of freedom or components within the vibration system.

7. What is the purpose of a dynamic vibration absorber?

a) To increase the natural frequencies of the system
b) To reduce the overall energy of the vibrating system
c) To amplify the amplitudes of vibration
d) To introduce damping into the system

Answer: b) To reduce the overall energy of the vibrating system

Explanation: Dynamic vibration absorbers are used to reduce the overall energy of the vibrating system by absorbing or dissipating vibrations.

8. How does a torsion vibration absorber function?

a) By converting rotational motion into linear motion
b) By introducing additional rotational inertia to the system
c) By damping torsional vibrations in the system
d) By amplifying the amplitude of torsional vibrations

Answer: c) By damping torsional vibrations in the system

Explanation: Torsion vibration absorbers function by damping torsional vibrations in the system, thereby reducing their amplitudes.

9. What type of vibration does a pendulum dynamic vibration represent?

a) Linear vibration
b) Torsional vibration
c) Rotational vibration
d) Oscillatory vibration

Answer: d) Oscillatory vibration

Explanation: A pendulum dynamic vibration represents oscillatory vibration, where the motion of the pendulum swings back and forth repeatedly.

10. Which of the following is a characteristic of harmonic excitation in forced vibrations?

a) Random frequency distribution
b) Constant amplitude over time

c) Non-repetitive motion
d) Unpredictable phase relationship

Answer: b) Constant amplitude over time

Explanation: Harmonic excitation in forced vibrations leads to a constant amplitude over time, as the excitation frequency remains constant.

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