1. What is Eddy’s Theorem related to in engineering?

a) Fluid dynamics
b) Structural analysis
c) Thermodynamics
d) Electrical engineering

Answer: b) Structural analysis
Explanation: Eddy’s Theorem is a principle used in structural analysis to determine the effects of loads on different structural components, particularly in relation to forces and moments.

2. What do suspension cables primarily support in bridge construction?

a) Deck
b) Abutments
c) Piers
d) Stiffening girders

Answer: a) Deck
Explanation: Suspension cables in bridge construction primarily support the deck, which is the roadway or walkway surface.

3. What purpose do stiffening girders serve in bridge construction?

a) Provide aesthetic appeal
b) Enhance structural stability
c) Facilitate drainage

d) Increase traffic flow

Answer: b) Enhance structural stability
Explanation: Stiffening girders are structural elements in bridge construction that are used to enhance the stability and rigidity of the bridge deck.

4. Which type of arch experiences rib shortening as a structural effect?

a) Three-hinged arch
b) Two-hinged arch
c) Fixed arch
d) Suspension arch

Answer: c) Fixed arch
Explanation: Fixed arches can experience rib shortening due to the compressive forces acting on the arch structure.

5. What is the primary function of suspension cables in bridge construction?

a) Resist compression forces
b) Distribute loads to abutments
c) Transfer tension forces
d) Provide vertical support

Answer: c) Transfer tension forces
Explanation: Suspension cables in bridge construction primarily transfer tension forces from the deck to the supporting towers or anchorages.

6. In which type of arch are temperature effects most significant?

a) Three-hinged arch
b) Fixed arch
c) Two-hinged arch
d) Suspension arch

Answer: c) Two-hinged arch
Explanation: Temperature effects are most significant in two-hinged arches due to their ability to rotate at the hinges in response to thermal expansion and contraction.

7. What structural component is used to mitigate temperature effects in arch bridges?

a) Stiffening girders
b) Suspension cables
c) Expansion joints
d) Abutments

Answer: c) Expansion joints
Explanation: Expansion joints are used in arch bridges to accommodate thermal expansion and contraction, thereby mitigating the effects of temperature variations on the structure.

8. Which theorem is utilized to analyze the stability of three-hinged arches?

a) Eddy’s Theorem
b) Castigliano’s Theorem
c) Maxwell’s Theorem
d) Betti’s Theorem

Answer: d) Betti’s Theorem
Explanation: Betti’s Theorem is commonly used in structural analysis to analyze the stability and behavior of three-hinged arches.

9. What distinguishes a two-hinged arch from a fixed arch?

a) Number of support points
b) Material composition
c) Span length
d) Structural flexibility

Answer: a) Number of support points
Explanation: A two-hinged arch has two support points, while a fixed arch has additional support points at its ends, making it fixed in position.

10. Which type of arch is characterized by the absence of vertical supports between the arch and the deck?

a) Three-hinged arch
b) Fixed arch
c) Two-hinged arch
d) Suspension arch

Answer: d) Suspension arch
Explanation: Suspension arches are characterized by the absence of vertical supports between the arch and the deck, with the load being primarily supported by suspension cables.