1. What type of earth pressure occurs when the soil is in a state of equilibrium and not moving?
a) Active earth pressure
b) Passive earth pressure
c) Earth pressure at rest
d) Coulomb’s earth pressure

Answer: c) Earth pressure at rest
Explanation: Earth pressure at rest occurs when the soil is not moving and is in a state of equilibrium. It represents the pressure exerted by the soil on a retaining wall or structure when no movement is occurring.

2. According to Rankine’s theory of earth pressure, what factor(s) influence(s) the magnitude of active earth pressure?
a) Friction angle of soil
b) Wall inclination
c) Wall height
d) All of the above

Answer: d) All of the above
Explanation: Rankine’s theory of earth pressure considers factors such as the friction angle of the soil, the inclination of the retaining wall, and the height of the wall to determine the magnitude of active earth pressure.

3. Coulomb’s earth pressure theory is primarily based on which principle?
a) Hydrostatics
b) Limit equilibrium

c) Elasticity
d) Plasticity

Answer: b) Limit equilibrium
Explanation: Coulomb’s earth pressure theory is based on the principle of limit equilibrium, which means that the retaining wall is on the verge of failure, and the forces acting on it are in equilibrium.

4. In layered soils, which layer typically experiences the highest earth pressure?
a) Top layer
b) Middle layer
c) Bottom layer
d) All layers experience equal pressure

Answer: a) Top layer
Explanation: In layered soils, the top layer typically experiences the highest earth pressure due to its proximity to the retaining wall and the absence of soil layers above it to counteract the pressure.

5. Culmann’s graphical method is used to determine what aspect of retaining walls?
a) Stability against overturning
b) Drainage from backfill
c) Bearing capacity
d) Reinforcement requirements

Answer: a) Stability against overturning
Explanation: Culmann’s graphical method is primarily used to analyze the stability of

retaining walls against overturning by graphically representing the forces acting on the wall and the stability conditions.

6. Which type of retaining wall relies on embedded steel reinforcement for added strength?
a) Gravity retaining wall
b) Cantilever retaining wall
c) Reinforced earth retaining wall
d) Sheet pile retaining wall

Answer: c) Reinforced earth retaining wall
Explanation: Reinforced earth retaining walls utilize embedded steel reinforcement within the soil mass to enhance its strength and stability, allowing for the construction of taller and more resilient retaining structures.

7. What is the primary purpose of providing adequate drainage in the backfill of a retaining wall?
a) To increase earth pressure
b) To reduce lateral movement
c) To decrease stability
d) To increase bearing capacity

Answer: b) To reduce lateral movement
Explanation: Adequate drainage in the backfill of a retaining wall helps to reduce the buildup of hydrostatic pressure, thereby minimizing the potential for lateral movement or failure of the wall.

8. Which factor does not directly affect the stability of a retaining wall against sliding?

a) Friction between soil and wall
b) Wall height
c) Backfill compaction
d) Wall inclination

Answer: b) Wall height
Explanation: While wall height indirectly affects stability factors such as overturning and bearing capacity, it does not directly influence the frictional resistance between the soil and the wall, which is crucial for resisting sliding.

9. Which type of retaining wall is typically the most cost-effective for low to moderate height applications?
a) Cantilever retaining wall
b) Gravity retaining wall
c) Anchored retaining wall
d) Gabion retaining wall

Answer: b) Gravity retaining wall
Explanation: Gravity retaining walls are often the most cost-effective solution for low to moderate height applications because they rely on the weight of the wall itself to resist the pressure of the retained soil, eliminating the need for extensive reinforcement or anchoring.

10. What is the critical factor in determining the stability of a reinforced earth retaining wall?
a) Soil type
b) Wall height
c) Reinforcement spacing
d) Connection strength between reinforcement and facing

Answer: d) Connection strength between reinforcement and facing
Explanation: The critical factor in determining the stability of a reinforced earth retaining wall is the strength of the connection between the reinforcement layers and the facing elements, as this connection transfers the tensile forces generated within the soil mass to the facing, ensuring overall stability.