

1. Which of the following best describes the load transfer mechanism in pile foundations?

- a) Compression
- b) Tension
- c) Shear
- d) Flexure

Answer: a) Compression

Explanation: Pile foundations primarily transfer loads through compression, whereby the weight of the structure is transmitted vertically through the piles to the stronger soil or rock strata below.

2. What is the function of friction piles?

- a) To transfer loads through skin friction
- b) To resist uplift forces
- c) To provide lateral support
- d) To anchor the foundation in cohesive soils

Answer: a) To transfer loads through skin friction

Explanation: Friction piles rely on the frictional resistance between the pile surface and the surrounding soil to transfer loads to the soil.

3. Which factor does NOT influence the selection of piles for a foundation?

- a) Soil type
- b) Structural design
- c) Environmental conditions
- d) Construction cost

Answer: d) Construction cost

Explanation: While construction cost is an important consideration, it is not a factor that directly influences the selection of piles. Soil type, structural design requirements, and environmental conditions play crucial roles in pile selection.

4. Which method is commonly used for installing driven piles?

- a) Vibroflotation
- b) Jetting
- c) Boring
- d) Hammering

Answer: d) Hammering

Explanation: Driven piles are typically installed by repeatedly striking them with a heavy hammer, driving them into the ground until the desired depth or resistance is achieved.

5. What type of soil is most suitable for end-bearing piles?

- a) Cohesive soil
- b) Granular soil
- c) Organic soil
- d) Expansive soil

Answer: b) Granular soil

Explanation: End-bearing piles are most effective in granular soils where they can reach a firm stratum or rock layer to transfer the load.

6. What is the primary method used to determine the pile load carrying capacity from static formulas?

- a) Analytical calculations
- b) Laboratory tests
- c) Field tests
- d) Numerical simulations

Answer: a) Analytical calculations

Explanation: Static formulas use analytical methods based on soil properties and pile geometry to estimate the load-carrying capacity of piles.

7. Which formula is commonly used for assessing pile load carrying capacity in dynamic conditions?

- a) ENR formula
- b) Hiley formula
- c) Terzaghi formula
- d) Meyerhof formula

Answer: a) ENR formula

Explanation: The Engineering News-Record (ENR) formula is widely used for estimating the load capacity of piles under dynamic conditions, such as during pile driving.

8. What type of test is conducted to determine the load capacity of a single pile?

- a) Plate load test
- b) Triaxial test
- c) Pile load test
- d) Field permeability test

Answer: c) Pile load test

Explanation: A pile load test involves applying incremental loads to a single pile to measure its response and determine its load-carrying capacity.

9. In pile groups, what does the term “efficiency” refer to?

- a) The ratio of load capacity to pile length
- b) The effectiveness of load transfer to the soil
- c) The alignment of piles within the group
- d) The resistance to lateral movement

Answer: b) The effectiveness of load transfer to the soil

Explanation: Efficiency in pile groups refers to how effectively the combined piles transfer loads to the soil, considering factors like spacing, depth, and soil conditions.

10. Negative skin friction occurs when:

- a) Piles are overloaded
- b) Piles are underloaded
- c) Soil consolidation increases
- d) Soil settlement decreases

Answer: c) Soil consolidation increases

Explanation: Negative skin friction occurs when surrounding soil consolidates, causing downward movement and generating frictional forces that act against the pile's upward movement.

11. Which type of pile is most suitable for cohesive soils?

- a) Steel piles
- b) Timber piles

- c) Concrete piles
- d) Composite piles

Answer: c) Concrete piles

Explanation: Concrete piles are often preferred for cohesive soils due to their ability to resist corrosion and provide structural integrity in cohesive soil conditions.

12. What is the primary function of friction piles in pile foundations?

- a) To transfer loads through end-bearing
- b) To resist lateral forces
- c) To distribute loads evenly
- d) To transfer loads through skin friction

Answer: d) To transfer loads through skin friction

Explanation: Friction piles rely on the frictional resistance between the pile surface and the surrounding soil to transfer loads effectively.

13. Which method of pile installation involves the use of water or air jets to aid penetration into the ground?

- a) Vibroflotation
- b) Jetting
- c) Boring
- d) Hammering

Answer: b) Jetting

Explanation: Jetting involves the use of water or air jets to fluidize the soil around the pile, reducing resistance and aiding penetration.

14. In which type of soil are end-bearing piles most effective?

- a) Sandy soil
- b) Clayey soil
- c) Peaty soil
- d) Gravelly soil

Answer: a) Sandy soil

Explanation: End-bearing piles are most effective in sandy or gravelly soils where they can reach a firm stratum or rock layer to transfer the load.

15. What is the purpose of conducting a pile load test?

- a) To determine the pile's material strength
- b) To assess the pile's lateral stability
- c) To estimate the pile's load-carrying capacity
- d) To evaluate the pile's resistance to corrosion

Answer: c) To estimate the pile's load-carrying capacity

Explanation: Pile load tests are conducted to measure the response of a pile to applied loads and to determine its load-carrying capacity in various soil conditions.