1. Which type of foundation is typically used for structures with relatively light loads and shallow soil depths?
a) Shallow foundation
b) Deep foundation
c) Pile foundation
d) Raft foundation
Answer: a) Shallow foundation
Explanation: Shallow foundations are commonly employed when the soil is sufficiently strong to support the structure without the need for extensive excavation.

2. Prandtl's theory of bearing capacity is primarily based on:
a) Soil cohesion only
b) Soil friction only
c) Both soil cohesion and friction
d) Soil permeability
Answer: a) Soil cohesion only
Explanation: Prandtl's theory focuses on the contribution of soil cohesion to bearing capacity, neglecting the effect of soil friction.

3. According to Rankine's theory, the ultimate bearing capacity of a foundation is primarily influenced by:
a) Soil cohesion
b) Soil friction
c) Foundation shape
d) Soil permeability
Answer: c) Foundation shape
Explanation: Rankine's theory considers the shape of the foundation as a critical factor

affecting its ultimate bearing capacity.

4. Terzaghi’s bearing capacity equation accounts for:
a) Only vertical loads
b) Only horizontal loads
c) Both vertical and horizontal loads
d) Soil permeability
Answer: c) Both vertical and horizontal loads
Explanation: Terzaghi’s bearing capacity equation considers both vertical and horizontal loads acting on the foundation.

5. According to Skempton’s theory, the bearing capacity of a foundation is primarily determined by:
a) Soil cohesion
b) Soil friction
c) Soil weight
d) Foundation shape
Answer: b) Soil friction
Explanation: Skempton’s theory emphasizes the role of soil friction in determining the bearing capacity of a foundation.

6. Meyerhof’s bearing capacity equation incorporates the influence of:
a) Foundation depth only
b) Foundation width only
c) Both foundation depth and width
d) Soil permeability
Answer: c) Both foundation depth and width

Explanation: Meyerhof’s bearing capacity equation considers both the depth and width of the foundation as influencing factors.

7. Which Indian standard provides guidelines for the determination of bearing capacity of shallow foundations?
a) IS 456
b) IS 800
c) IS 1893
d) IS 6403
Answer: d) IS 6403
Explanation: IS 6403 provides guidelines for the determination of bearing capacity of shallow foundations as per Indian standards.

8. Settlement of a foundation is primarily caused by:
a) Shear strength of soil
b) Elastic deformation of soil
c) Soil compaction
d) Soil erosion
Answer: b) Elastic deformation of soil
Explanation: Settlement occurs primarily due to the elastic deformation of soil under the load of the structure.

9. What is the permissible settlement for most structures?
a) 1 mm
b) 10 mm
c) 100 mm
d) 1000 mm

Answer: a) 1 mm
Explanation: The permissible settlement for most structures is typically limited to 1 mm to ensure the stability and safety of the building.

10. Which factor is crucial in proportioning footings for equal settlement?
a) Soil cohesion
b) Soil permeability
c) Uniformity of loading
d) Foundation depth
Answer: c) Uniformity of loading
Explanation: Uniform loading helps in ensuring equal settlement across the footing, thus requiring consideration in proportioning footings.

11. In-situ tests such as SPT and SCPT are primarily used for:
a) Determining soil permeability
b) Determining soil strength
c) Measuring settlement
d) Measuring bearing capacity
Answer: b) Determining soil strength
Explanation: Standard Penetration Test (SPT) and Cone Penetration Test (SCPT) are commonly used for determining the strength characteristics of soil.

12. What factor significantly affects the bearing capacity of a foundation?
a) Foundation depth
b) Foundation width
c) Soil type
d) Soil color

Answer: c) Soil type
Explanation: The type of soil greatly influences its bearing capacity and, consequently, the bearing capacity of the foundation.

13. Contact pressure under rigid footings is typically:
a) Uniform
b) Non-uniform
c) Maximum at the center
d) Maximum at the edges
Answer: a) Uniform
Explanation: Rigid footings distribute the load uniformly over the entire contact area with the soil.

14. Floating foundations are primarily used in areas with:
a) Soft soil
b) Hard rock
c) High water table
d) Low water table
Answer: a) Soft soil
Explanation: Floating foundations are suitable for soft soil conditions where conventional foundations may not be effective due to excessive settlement.

15. Which of the following is NOT a component of settlement?
a) Elastic settlement
b) Consolidation settlement
c) Creep settlement
d) Frictional settlement

Answer: d) Frictional settlement
Explanation: Frictional settlement is not a recognized component of settlement; it’s likely a misunderstanding of other settlement mechanisms.