1. Select the incorrect statement.
   (a) Soil is defined as the cemented aggregate of mineral grains and decayed organic matter (solid particles) with liquid and gas in the empty spaces between the solid particles.
   (b) Soil is used as a construction material in various civil engineering projects.
   (c) Soil mechanics is the branch of science that deals with the study of the physical properties of soil and the behaviour of soil masses subjected to various types of forces.
   (d) Geotechnical engineering deals with the application of the principles of soil mechanics and rock mechanics to the design of foundations, retaining structures and earth structures.

2. Which one of the following problems is related to the Leaning Tower of Pisa in Italy?
   (a) Slope instability
   (b) Weakness in foundation soil
   (c) Structural instability
   (d) all of the above

3. During Classical Soil Mechanics period (1776–1856), most of the geotechnical engineering developments came from engineers and scientists in
   (a) England.
   (b) Germany.
   (c) Italy.
   (d) France.

4. N/m³ is the SI unit of
   (a) weight.
   (b) unit weight.
   (c) density.
   (d) none of the above

5. The unit of water is
   (a) 9.8 kN/m³.
   (b) 13.4 kN/m³.
   (c) 16.0 kN/m³.
   (d) 18.9 kN/m³.

6. Who was the first to use the symbol \( \phi \) for soil friction angle?
   (a) Charles Augustin Coulomb (1736–1806)
   (b) Jean Victor Poncelet (1788–1867)
   (c) William John Macquorn Rankine (1820–1872)
   (d) Karl Terzaghi (1883–1963)
7. Who is known as the father of modern soil mechanics?
   (a) Charles Augustine Coulomb (1736–1806)
   (b) Jean Victor Poncelet (1788–1867)
   (c) William John Macquorn Rankine (1820–1872)
   (d) Karl Terzaghi (1883–1963)

8. In 1997, the International Society of Soil Mechanics and Foundation Engineering (ISSMFE) was renamed as
   (a) International Society of Soil Mechanics (ISSM).
   (b) International Society of Geotechnical Engineering (ISGE).
   (c) International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE).
   (d) International Society of Foundation Engineering and Geotechnical Engineering (ISFEGE).

9. Ancient Greek civilization used
   (a) isolated pad foundation.
   (b) strip foundation.
   (c) Raft foundation.
   (d) all of the above

10. Which one of the following topics is not a part of geotechnical engineering?
    (a) Earth slopes
    (b) Foundations
    (c) Retaining Walls
    (d) Roof slabs
Answers, Hints and Discussion

1. (a)  
   *Discussion*: The incorrect statement in (a) is corrected as:  
   Soil is defined as the uncemented aggregate of mineral grains and decayed organic matter (solid particles) with liquid and gas in the empty spaces between the solid particles.

2. (b)

3. (d)

4. (b)  
   *Discussion*: *Unit weight* is the weight of soil per unit volume. It is explained in detail in Chapter 3 of the textbook. Students should have an idea of its typical values for soils and rocks given on Page 5 of the textbook.

5. (a)

6. (b)

7. (d)

8. (e)

9. (d)  
   *Discussion*: A detailed description of these foundations is given in Chapter 16. *Raft foundation* is also known as *mat foundation*.

10. (d)  
    *Discussion*: Analysis and design of roof slabs are explained in structural engineering subjects such as Structural analysis, Concrete design, Steel design, etc.