1. Residual soils are formed by
   a. Glaciers
   b. Wind
   c. Water
   d. None of the above

2. Water content of soil can
   a. Never be greater than 100%
   b. Take values only from 0 % to 100%
   c. Be less than 0 %
   d. Be greater than 100%

3. Which of the following types of soil is transported by gravitational forces
   a. Loess
   b. Talus
   c. Drift
   d. Dune sand

4. A fully saturated soil is said to be
   a. One phase system
   b. Two phase system with soil and sir
   c. Two phase system with soil and water
   d. Three phase system

5. Valid range for S, the degree of saturation of soil in percentage is
   a. $S > 0$
   b. $S \leq 0$
   c. $0 < S < 100$
   d. $0 \leq S \leq 100$

6. The submerged density of soil in terms of unit weight of water γ_w specific gravity G and voids ratio e is given by the expression
   a. $\frac{\Upsilon_w(G+1)}{1+e}$
   b. $\frac{\Upsilon_w(G-1)}{1-e}$
   c. $\frac{\Upsilon_w(G+1)}{1-e}$
   d. $\frac{\Upsilon_w(G-1)}{1+e}$

7. A soil has a bulk density of 22 kN/m^3 and water content 10% the dry density of soil is
   a. 18.6 kN/m^3
   b. 20.0 kN/m^3
   c. 22.0 kN/m^3
   d. 23.2 kN/m^3

8. If the voids a soil mass are full of air only, the soil is termed as
   a. Air entrained soil
   b. Partially saturated soil
   c. Dry soil
   d. Dehydrated soil

9. Valid range for n, the percentage voids is
   a. $0 < n < 100$
   b. $0 \leq n \leq 100$
   c. $N > 0$
   d. $N \leq 0$

10. Select the correct statements.
   a. Unit weight of dry soil is greater than unit weight of wet soil.
   b. For dry soils, dry unit weight is less than total unit weight.
   c. Unit weight of soil increases due to submergence in water
   d. Unit weight of soil decreases due to submergence in water

11. Voids ratio of a soil mass can
   a. Never be greater than unity be zero
   b. Be zero
   c. Take any value greater than zero
   d. Take values between 0 and 1 only

12. If the volume of voids is equal to the volume of solids in a soil mass, then the values of porosity and voids ratio respectively are
   a. 1.0 and 0.0
   b. 0.0 and 1.0
   c. 0.5 and 1.0
   d. 1.0 and 0.5

13. When the degree of saturation is zero the soil mass under consideration represents
   a. One phase system
   b. Two phase system with soil and air
   c. Two phase system with soil and water
   d. Three phase system

14. Select the correct range of density index, I_D
   a. $I_D > 0$
   b. $I_D \geq 0$
   c. $0 < I_D < 1$
   d. $0 \leq I_D \leq 1$

15. If the degree of saturation of a partially saturated soil is 60% then air content of the soil is
   a. 40%
   b. 60%
   c. 80%
   d. 100%

16. If the water content of a fully saturated soil mass is 100% then the voids ratio of the sample is
   a. B/2
   b. B/3
   c. B/4
   d. B/6

17. The ratio of volume of voids to the total volume of soil mass is called
   a. Air content
   b. Porosity
   c. Percentage air voids
   d. Voids ratio

18. Relative density of a compacted dense sand is approximately equal to
   a. 0.4
   b. 0.6
   c. 0.95
   d. 1.20

19. If the sand in-situ is in its densest state then the relative density of sand is
   a. Zero
   b. 1
   c. Between 0 and 1
   d. Greater than 1

20. Which of the following methods is most accurate for the determination of the water content of soil
   a. Oven drying method
   b. Sand bath method
   c. Calcium carbide method
   d. Pycnometer method

21. For proper field control which of the following methods is best suited for quick determination of water content of a soil mass
   a. Oven drying method
   b. Sand bath method
   c. Alcohol method
   d. Calcium carbide method

22. A pycnometer is used to determine
   a. Water content and voids ratio
   b. Specific gravity and dry density
   c. Water content and specific gravity
   d. Voids ratio and dry density

23. stoke's law is valid only if the size of particle is

a. Less than 0.0002 mm
b. Greater than 0.2 mm
c. Between 0.2 mm and 0.0002 mm
d. All of the above

24. In hydrometer analysis for a soil mass

a. Both meniscus correction and dispersing agent correction are additive
b. Both meniscus correction and dispersing agent correction are subtractive
c. Meniscus correction is additive and dispersing agent correction is subtractive
d. Meniscus correction is subtractive and dispersing agent correction is additive

25. The hydrometer method of sedimentation analysis differs from the pipette analysis mainly in

a. The principle of test
b. The method of taking observations
c. All of the above

26. Which of the following is a measure of particle size range

a. Effective size
b. Uniformity coefficient
c. Coefficient of curvature
d. None of the above

27. Which of the following statements is correct

a. Uniformity coefficient represents the shape of the particle size distribution curve
b. For a well grade soil, both uniformity coefficient and coefficient of curvature are nearly unity.
c. A soil is said to be well grade if it has most of the particles of about the same size
d. None of the above

28. Uniformity coefficient of a soil is

a. Always less than 1
b. Always equal to 1
c. Equal to or less than 1
d. Equal to or greater than 1

29. According to atterberg, the soil is said to be of medium plasticity if the plasticity index PI is

a. $0 < PI < 7$
b. $7 \leq PI \leq 17$
c. $17 < PI < 27$
d. $PI \geq 27$

30. If the natural water content of soil mass lies between its liquid limit and plastic limit the soil mass is said to be in

a. Liquid state
b. Plastic state
c. Semi-solid state
d. Solid state

31. Match List I (Investigator) with List II (Equation) and select the correct answer using the codes given below the lists:

List I	List II
A. Skempton	1. $v = k$
B. Coulomb	2. $\sigma = \sigma$
C. Stokes	3. $V = \frac{D^2(\Upsilon_s - \Upsilon_w)}{18\eta}$
D. Terzaghi	4. $S = c + \sigma \tan \phi$
	5. $u = B[\sigma_3 + A(\sigma - \sigma_3)]$

a. A-4 B-5 C-3 D-2
b. A-5 B-4 C-3 D-2
c. A-4 B-5 C-1 D-3
d. A-5 B-4 C-2 D-3

32. Which one of the following pairs of parameters and expressions is not correctly matched?

a. Coefficient of consolidation ..... $\frac{T_v H^2}{t}$
b. Coeff. Of volume compressibility... $\frac{e_0 - e}{(1+e_0)(p - p_0)}$
c. Over consolidation ratio ..... $\sqrt{\frac{Maximum\ previous\ effective\ pressure}{Existing\ effective\ pressure}}$
d. Modulus of volume change.. $\frac{a_V}{1+e_0}$

33. Consider the following

1. Initial consolidation
2. Primary consolidation
3. Secondary consolidation
4. Final consolidation

The three stages which would be relevant to consolidation of a soil deposit includes

a. 1, 2 and 3
b. 2, 3 and 4
c. 1, 3 and 4
d. 1, 2 and 4

34. As per terzaghi's equation, the bearing capacity of strip footing resting on cohesive soil (c = 10 kN/m^2)for unit depth and unit width (assume N_c as 5.7)is

a. 45 kN/m^2
b. 57 kN/m^2
c. 67 kN/m^2
d. 77 kN/m^2

35. With a vertical point load on the surface when considering the vertical plane passage through the load, the stress gets reduced by 52.3% at a depth of

a. 0.25 of unit length
b. 0.5 of unit length
c. 0.75 of unit length
d. 1 of unit length

36. Ratio of bearing capacity of double under reamed (U.R)pile to that of single U.R pile is nearly

a. 2
b. 1.5
c. 1.2
d. 1.7

37. A raft of 6 m 9 m is founded at a depth of 3 m in a cohesive soil having c = 120 kN/m^2 . The ultimate net bearing capacity of the soil using Terzagh's theory will be nearly

a. 820 kN/m^2
b. 920 kN/m^2
c. 1036 kN/m^2
d. 1067 kN/m^2

38. The standard penetration resistance N of a granular deposit is found to be 20. the soil can be classified approximately in terms ϕ and density index respectively as

a. 20^0 and 10% for very loose condition
b. 32^0 and 50% for medium condition
c. 32^0 and 30% for loose condition
d. 38^0 and 65% for dense condition

39. If the proportion of soil passing 75 micron sieve is 50% and the liquid limit and plastic limit are 40% and 20% respectively then the group index of the soil is

a. 3.8
b. 6.5
c. 38
d. 65

Direction : select your answer to the following question using the codes given below

40. Assertion A : Black cotton soils are expansive soil
Reason R : black cotton soils are residual soils

a. both A and R are true and R is the correct exaltation of A
b. Both A and R are true but R is not a correct explanation of A
c. A is true but R is false
d. A is false but R is true

Direction : select your answer to the following question using the codes given below

41. Assertion A : Lowering of ground water table causes settlement
Reason R : Removal of neutral pressure increases the effective pressure

a. both A and R are true and R is the correct exaltation of A
b. Both A and R are true but R is not a correct explanation of A
c. A is true but R is false
d. A is false but R is true

Direction : select your answer to the following question using the codes given below:

42. Assertion A : A rigid footing resting on sand layer and carrying uniformly distributed load develops contact pressure the magnitude of which is less at the edges than the at the centre of footing
Reason R : in the case of a rigid footing the settlement has to be uniform for which the contact pressure distribution is non-uniform

a. both A and R are true and R is the correct exaltation of A
b. Both A and R are true but R is not a correct explanation of A
c. A is true but R is false
d. A is false but R is true

Direction : select your answer to the following question using the codes given below

43. Assertion A : Transition stage from semisolid state to solid state of soil is termed as shrinkage limit.
Reason R : After the semisolid state, any reduction in water content will cause shrinkage in the volume of the soil

a. both A and R are true and R is the correct exaltation of A
b. Both A and R are true but R is not a correct explanation of A
c. A is true but R is false
d. A is false but R is true

Direction : select your answer to the following question using the codes given below

44. Assertion A : The rate of settlement of building constructed on sandy clays are faster than those constructed on clayey soils.
Reason R : The rate of consolidation is dependent on permeability of soils.

a. both A and R are true and R is the correct exaltation of A
b. Both A and R are true but R is not a correct explanation of A
c. A is true but R is false
d. A is false but R is true

Direction : select your answer to the following question using the codes given below

45. Assertion A : Boussinseq equation is not suitable for sedimentary deposits:
Reason R : Sedimentary deposits do not represent an istropic and homogeneous system.
   a. both A and R are true and R is the correct exaltation of A
   b. Both A and R are true but R is not a correct explanation of A
   c. A is true but R is false
   d. A is false but R is true

Direction : select your answer to the following question using the codes given below

46. Assertion A : All theoretical approaches indicate that at greater depths, bearing capacity of pile base In sand is practically independent fs its size and is proportional to overburden
Reason R : When the depth of overburden is very great, the value of the term "$_{1/2\gamma}$"BN_{γ} of the bearing capacity equation is neglected for all practical purposes.
   a. both A and R are true and R is the correct exaltation of A
   b. Both A and R are true but R is not a correct explanation of A
   c. A is true but R is false
   d. A is false but R is true

Direction : select your answer to the following question using the codes given below

47. Assertion A : Plate load test is a field test to determine the ultimate bearing capacity of soil and also the probable settlement under a given loading.
Reason R : The plate load test does not give the ultimate settlement particularly in the case of cohesive soils.
   a. both A and R are true and R is the correct exaltation of A
   b. Both A and R are true but R is not a correct explanation of A
   c. A is true but R is false
   d. A is false but R is true

Direction : select your answer to the following question using the codes given below

48. Assertion A : The quick sand leading to liquefaction is not a type of sand but a flow condition occurring a cohesionless soil when its effective pressure is reduced to zero
Reason R : equal amount of the upward water pressure and the downward pressure of the submerged soil mass are acting.
   a. both A and R are true and R is the correct exaltation of A
   b. Both A and R are true but R is not a correct explanation of A
   c. A is true but R is false
   d. A is false but R is true

Direction : select your answer to the following question using the codes given below

49. Assertion A : Terzaghi's bearing capacity theory is not applied to deep foundations.
Reason R : Shear strength is mobilized on the sides of deep foundations.
   a. both A and R are true and R is the correct exaltation of A
   b. Both A and R are true but R is not a correct explanation of A
   c. A is true but R is false
   d. A is false but R is true

Direction : select your answer to the following question using the codes given below

50. Assertion A : Bearing capacity of an under-reamed pile is less than that of a straight bored pile of the same diameter.
Reason R : Under-reamed piles have enlarged bulbs.
   a. both A and R are true and R is the correct exaltation of A
   b. Both A and R are true but R is not a correct explanation of A
   c. A is true but R is false
   d. A is false but R is true